



Australian Government

PMC10 Manufactured Mineral Products

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Modification History

Version Modification History

Version	Release Date	Comments
1	16 April 2010	Initial release

Imprint

PMC10 Manufactured Mineral Products

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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.

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This Training Package is Version 1 - check whether this is the latest version by going to the National Training Information Service (www.ntis.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).

Version modification history

The version details of this endorsed Training Package are in the table below. The latest information is at the top of the table.

Version	Release Date	Comments
1	30 April 2010	Initial release

PMC10 replaces PMC04.

Summary of AQF qualifications in this Training Package

Qualification Code	Title
PMC20110	Certificate II in Manufactured Mineral Products
PMC30110	Certificate III in Manufactured Mineral Products
PMC40110	Certificate IV in Manufactured Mineral Products
PMC50110	Diploma of Manufactured Mineral Products
PMC60110	Advanced Diploma of Manufactured Mineral Products
PMC70110	Vocational Graduate Certificate in Refractories Engineering

Units of Competency in this Training Package and their prerequisites

Code	Title	Prerequisite
PMC552002C	Operate equipment to blend/mix materials	None
PMC552003C	Operate grinding equipment	None
PMC552004C	Prepare for production	None
PMC552005C	Process greenware/green products	None
PMC552006C	Operate an autoclave	None
PMC552007B	Heat accelerate the curing of precast concrete	None
PMC552008B	Operate crushing equipment	None
PMC552010C	Operate a calcining kiln	None
PMC552020C	Operate slip casting equipment	None
PMC552021C	Operate manual glazing equipment	None
PMC552022C	Prepare materials for clay and ceramic production	None
PMC552023C	Finish products after firing	None

PMC552024C	Hand mould products	None
PMC552030C	Operate a firing kiln	None
PMC552031C	Operate extrusion equipment	None
PMC552032C	Operate pressing equipment	None
PMC552040C	Operate glass melting process	None
PMC552041C	Operate process ovens	None
PMC552042C	Operate blown insulation equipment	None
PMC552043C	Operate float forming equipment	None
PMC552044C	Operate fibre forming equipment	None
PMC552045C	Operate container forming equipment	None
PMC552046C	Operate glass printing equipment	None
PMC552047C	Operate primary annealing equipment	None
PMC552048C	Operate glass finishing equipment	None
PMC552049C	Operate on-line stacking and assembly equipment	None
PMC552050C	Schedule, cut and bend reinforcement	None
PMC552051C	Finish green concrete products	None
PMC552052C	Cast moulded concrete products	None
PMC552053C	Finish cured concrete products	None
PMC552054C	Spin concrete pipes	None
PMC552055C	Conduct benching operations	None
PMC552056B	Assemble, fabricate and place reinforcement	None
PMC552057B	Finish casting operation	None
PMC552058B	Demould concrete products	None
PMC552060C	Batch mix concrete	None
PMC552061C	Deliver concrete to site	None

PMC552065B	Prepare asphalt	None
PMC552070B	Operate forming equipment	None
PMC552071B	Operate wet and dry end equipment	None
PMC552072B	Produce fibrous plasterboard	None
PMC552090B	Use and maintain tools and equipment for refractory operations	None
PMC552091B	Prepare for, install and repair refractory brickwork/blockwork	None
PMC552092B	Prepare for and install mouldable refractory materials	None
PMC552093B	Prepare for and cast refractory materials	None
PMC552094B	Prepare for and apply shotcrete for installation	None
PMC552095B	Prepare for, install and repair ceramic fibre	None
PMC553000C	Set up and tune a process	None
PMC553010C	Process raw meal into product	PMC552010C
PMC553020C	Prepare moulds and dies	None
PMC553021C	Set up and tune glazing equipment	None
PMC553040C	Set up and optimise glass forming process	None
PMC553041C	Set up and optimise glass furnace process	None
PMC553042C	Set up and optimise secondary process	None
PMC553050C	Produce architectural precast concrete	None
PMC553051B	Produce structural precast concrete	None
PMC553070B	Design and construct moulds for fibrous plaster products	PMC552024C
PMC553072B	Model fibrous plaster products	None
PMC553080B	Set up and optimise finishing process	None
PMC554020D	Design and prepare models, moulds and dies	None
PMC554090B	Undertake simple refractory design	None

PMC554091B	Analyse refractory failures	None
PMC555030C	Analyse equipment performance	None
PMC555031B	Choose materials for an application	None
PMC556031C	Design structural/mechanical components	PMC555031B
PMC557001A	Manage trials	None
PMC557090A	Select refractory materials for an application	None
PMC557091A	Design a refractory lining	None
PMC557092A	Specify and interpret refractory tests	None
PMC557093A	Design a refractory/ceramic component	None
PMC557094A	Investigate refractory failures	None
PMC557095A	Specify and monitor the installation of monolithic/castable refractories	None
PMC557096A	Specify and monitor the installation of block/precast refractories	None
PMC557097A	Specify and monitor repairs to refractory installations	None
PMC557098A	Specify refractory installation systems	None
PMC561072C	Store materials for production	None
PMC561080B	Organise self	None
PMC562070B	Move materials	None
PMC562071C	Operate bulk materials handling equipment	None
PMC562075B	Maintain kiln refractory	None
PMC562081B	Deliver customer service	None
PMC562083C	Allocate and complete team tasks	None
PMC563081C	Carry out stock control	None

Imported units of competency in this Training Package

Code	Title	Origin
LMTGN5004A	Manage installation and commissioning of equipment and systems	LMT07
MEM09002B	Interpret technical drawing	TBA
MEM09003B	Prepare basic engineering drawing	TBA
MNMC205A	Conduct local risk assessment	MNM05
MSACMC411A	Lead a competitive manufacturing team	MSA07
MSACMC413A	Lead team culture improvement	MSA07
MSACMC610A	Manage relationships with non-customer external organisations	MSA07
MSACMC611A	Manage people relationships	MSA07
MSACMC612A	Manage workplace learning	MSA07
MSACMG700A	Review continuous improvement processes	MSA07
MSACMG702A	Review manufacturing practice tools and techniques	MSA07
MSACMG707A	Respond to a major non-conformance	MSA07
MSACMG712A	Lead a problem solving process to determine and solve root cause	MSA07
MSACMS401A	Ensure process improvements are sustained	MSA07
MSACMT230A	Apply cost factors to work practices	MSA07
MSACMT231A	Interpret product costs in terms of customer requirements	MSA07
MSACMT240A	Apply 5S procedures in a manufacturing environment	MSA07
MSACMT250A	Monitor process capability	MSA07
MSACMT251A	Apply quality standards	MSA07
MSACMT260A	Use planning software systems in manufacturing	MSA07
MSACMT270A	Use sustainable energy practices	MSA07
MSACMT271A	Use sustainable environmental practices	MSA07

MSACMT271A	Use sustainable environmental practices	MSA07
MSACMT280A	Undertake root cause analysis	MSA07
MSACMT281A	Contribute to the application of a proactive maintenance strategy	MSA07
MSACMT430A	Improve cost factors in work practices	MSA07
MSACMT440A	Lead 5S in a manufacturing environment	MSA07
MSACMT441A	Facilitate continuous improvement in manufacturing	MSA07
MSACMT450A	Undertake process capability improvements	MSA07
MSACMT451A	Mistake proof a production process	MSA07
MSACMT452A	Apply statistics to processes in manufacturing	MSA07
MSACMT460A	Facilitate the use of planning software systems in manufacturing	MSA07
MSACMT481A	Undertake proactive maintenance analyses	MSA07
MSACMT482A	Assist in implementing a proactive maintenance strategy	MSA07
MSACMT640A	Manage 5S system in a manufacturing environment	MSA07
MSACMT641A	Implement a continuous improvement system	MSA07
MSACMT650A	Determine and improve process capability	MSA07
MSACMT660A	Develop the application of enterprise systems in manufacturing	MSA07
MSACMT661A	Determine and establish information collection requirements and processes	MSA07
MSACMT670A	Develop and manage sustainable energy practices	MSA07
MSACMT671A	Develop and manage sustainable environmental practices	MSA07
MSACMT675A	Facilitate the development of a new product	MSA07
MSACMT681A	Develop a proactive maintenance strategy	MSA07
MSAENV272A	Participate in environmentally sustainable work practices	MSA07
MSAENV472A	Implement and monitor environmentally sustainable work	MSA07

	practices	
MSAENV672A	Develop workplace policy and procedures for sustainability	MSA07
MSAPMOHS110A	Follow emergency response procedures	MSA07
MSAPMOHS200A	Work safely	MSA07
MSAPMOHS300A	Facilitate the implementation of OHS for a work group	MSA07
MSAPMOHS400A	Contribute to OHS management system	MSA07
MSAPMOHS401A	Assess risk	MSA07
MSAPMOHS503A	Maintain the workplace OHS management system	MSA07
MSAPMOHS510A	Manage risk	MSA07
MSAPMOHS601A	Establish workplace OHS management system	MSA07
MSAPMOPS100A	Use equipment	MSA07
MSAPMOPS101A	Make measurements	MSA07
MSAPMOPS200A	Operate equipment	MSA07
MSAPMOPS212A	Use enterprise computers or data systems	MSA07
MSAPMOPS400A	Optimise process/plant area	MSA07
MSAPMOPS401A	Trial new process or product	MSA07
MSAPMOPS404A	Co-ordinate maintenance	MSA07
MSAPMOPS405A	Identify problems in fluid power system	MSA07
MSAPMOPS406A	Identify problems in electronic control systems	MSA07
MSAPMPER200B	Work in accordance with an issued permit	MSA07
MSAPMPER201A	Monitor and control work permits	MSA07
MSAPMPER202A	Observe permit work	MSA07
MSAPMPER205B	Enter confined space	MSA07
MSAPMPER300B	Issue work permits	MSA07
MSAPMPER400A	Coordinate permit process	MSA07

MSAPMSUP100A	Apply workplace procedures	MSA07
MSAPMSUP101A	Clean workplace or equipment	MSA07
MSAPMSUP102A	Communicate in the workplace	MSA07
MSAPMSUP106A	Work in a team	MSA07
MSAPMSUP200A	Achieve work outcomes	MSA07
MSAPMSUP201A	Receive or despatch goods	MSA07
MSAPMSUP210A	Process and record information	MSA07
MSAPMSUP230A	Monitor process operations	MSA07
MSAPMSUP240A	Undertake minor maintenance	MSA07
MSAPMSUP280A	Manage conflict at work	MSA07
MSAPMSUP292A	Sample and test materials and product	MSA07
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	MSA07
MSAPMSUP303A	Identify equipment faults	MSA07
MSAPMSUP310A	Contribute to development of plant documentation	MSA07
MSAPMSUP330A	Develop and adjust a production schedule	MSA07
MSAPMSUP382A	Provide coaching/mentoring in the workplace	MSA07
MSAPMSUP390A	Use structured problem solving tools	MSA07
MSL916005A	Manage complex projects	MSL09
MSL952001A	Collect routine site samples	MSL09
MSL973001A	Perform basic tests	MSL09
MSL974005A	Perform physical tests	MSL09
PMAOPS101C	Read dials and indicators	PMA08
PMAOPS105C	Select and prepare materials	PMA08
PMAOPS216B	Operate local control system	PMA08

PMAOPS305B	Operate process control systems	PMA08
PMAOPS402A	Respond to abnormal process situations	PMA08
PMAOPS405A	Operate complex control systems	PMA08
PMAOPS500A	Optimise production systems	PMA08
PMAOPS501A	Provide operational expertise to a project team	PMA08
PMAOPS505A	Control the process in abnormal situations	PMA08
PMAOPS511B	Determine energy transfer loads	PMA08
PMAOPS512B	Determine mass transfer loads	PMA08
PMAOPS520C	Manage utilities	PMA08
PMAOPS521C	Plan plant shutdown	PMA08
PMAOPS522A	Coordinate plant shut down	PMA08
PMAOPS600C	Modify plant	PMA08
PMAOPS601A	Debottleneck plant	PMA08
PMASUP420B	Minimise environmental impact of process	PMA08
PMASUP520B	Review procedures to minimise environmental impact of process	PMA08
PMBHAN103C	Shift materials safely by hand	PMB07
PMBTECH502B	Review and analyse production trials and specify retrials	PMB07
PSPPM402B	Manage simple projects	PSP04
PSPPM502B	Manage complex projects	PSP04
TAAASS301B	Contribute to assessment	TAA04
TAAASS401C	Plan and organise assessment	TAA04
TAAASS402C	Assess competence	TAA04
TAAASS403B	Develop assessment tools	TAA04
TAAASS404B	Participate in assessment validation	TAA04

TAADEL301C	Provide training through instruction and demonstration of work skills	TAA04
TLIC307C	Drive medium rigid vehicle	TLI07
TLIC407D	Drive heavy rigid vehicle	TLI07
TLID1007C	Operate a forklift	TLI07

Mapping to Previous Training Package

Mapping to Previous Training Package

PMC10 - Mapping of Qualifications

PMC10		PMC04		
Code	Title	Code	Title	Relationship
		PMC10104	Certificate I in Manufactured Mineral Products	Not carried forward – MSA10207 Certificate I in Process Manufacturing in MSA07 is an equivalent qualification.
PMC20110	Certificate II in Manufactured Mineral Products	PMC20104	Certificate II in Manufactured Mineral Products	Equivalent
		PMC20204	Certificate II in Production Support	Not carried forward – MSA20107 Certificate II in Process Manufacturing in MSA07 is an equivalent qualification.
PMC30110	Certificate III in Manufactured Mineral Products	PMC30104	Certificate III in Manufactured Mineral Products	Not equivalent – less mandatory units, restriction on number of CII units and reduced importation allowance. Technical outcomes considered equivalent.

		PMC30204	Certificate III in Production Support	Not carried forward – MSA30107 Certificate III in Process Manufacturing in MSA07 is an equivalent qualification.
PMC40110	Certificate IV in Manufactured Mineral Products	PMC40104	Certificate IV in Manufactured Mineral Products	Not equivalent – less mandatory units, restriction on number of CII and III units and reduced importation allowance. Technical outcomes considered equivalent.
PMC50110	Diploma of Manufactured Mineral Products	PMC50104	Diploma of Manufactured Mineral Products	Not equivalent – direct entry qualification. Technical outcomes considered equivalent.
PMC60110	Advanced Diploma of Manufactured Mineral Products	PMC60104	Advanced Diploma of Manufactured Mineral Products	Not equivalent – entry via Diploma, PMC50110 units embedded. Technical outcomes considered equivalent.
PMC70110	Vocational Graduate Certificate in Refractories Engineering			New qualification

PMC10 – Mapping of Units and Prerequisite requirements

Mapping of PMC10 to PMC04

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
LMTGN5004 A	Manage installation and commissioning of equipment		LMTEMGN07A	Manage installation and commissioning of equipment	Equivalent

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
	and systems			and systems	
MEM09002B	Interpret technical drawing				New to PMC10
MEM09003B	Prepare basic engineering drawing	MEM09002B	PMBPREP508A	Produce drawings	
MNMC205A	Conduct local risk assessment				New to PMC10
MSACMC411A	Lead a competitive manufacturing team				New to PMC10
MSACMC413A	Lead team culture improvement				New to PMC10
MSACMC610A	Manage relationships with non-customer external organisations				New to PMC10
MSACMC611A	Manage people relationships				New to PMC10
MSACMC612A	Manage workplace learning				New to PMC10
MSACMG700A	Review continuous improvement processes				New to PMC10
MSACMG702A	Review manufacturing practice tools and techniques				New to PMC10

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
MSACMG707 A	Respond to a major non-conformance				New to PMC10
MSACMG712 A	Lead a problem solving process to determine and solve root cause				New to PMC10
MSACMS401 A	Ensure process improvements are sustained				New to PMC10
MSACMT230 A	Apply cost factors to work practices				New to PMC10
MSACMT231 A	Interpret product costs in terms of customer requirements				New to PMC10
MSACMT240 A	Apply 5S procedures in a manufacturing environment				New to PMC10
MSACMT250 A	Monitor process capability				New to PMC10
MSACMT251 A	Apply quality standards				New to PMC10
MSACMT260 A	Use planning software systems in manufacturing				New to PMC10
MSACMT270 A	Use sustainable energy practices				New to PMC10
MSACMT271 A	Use sustainable environmental practices				New to PMC10

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
MSACMT271 A	Use sustainable environmental practices				New to PMC10
MSACMT280 A	Undertake root cause analysis				New to PMC10
MSACMT281 A	Contribute to the application of a proactive maintenance strategy				New to PMC10
MSACMT430 A	Improve cost factors in work practices				New to PMC10
MSACMT440 A	Lead 5S in a manufacturing environment				New to PMC10
MSACMT441 A	Facilitate continuous improvement in manufacturing				New to PMC10
MSACMT450 A	Undertake process capability improvements	MSACMT452 A			New to PMC10
MSACMT451 A	Mistake proof a production process				New to PMC10
MSACMT452 A	Apply statistics to processes in manufacturing				New to PMC10
MSACMT460 A	Facilitate the use of planning software systems in manufacturing	MSACMT260 A			New to PMC10
MSACMT481	Undertake				New to

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
A	proactive maintenance analyses				PMC10
MSACMT482 A	Assist in implementing a proactive maintenance strategy				New to PMC10
MSACMT640 A	Manage 5S system in a manufacturing environment				New to PMC10
MSACMT641 A	Implement a continuous improvement system				New to PMC10
MSACMT650 A	Determine and improve process capability	MSACMT452 A			New to PMC10
MSACMT660 A	Develop the application of enterprise systems in manufacturing				New to PMC10
MSACMT661 A	Determine and establish information collection requirements and processes				New to PMC10
MSACMT670 A	Develop and manage sustainable energy practices				New to PMC10
MSACMT671 A	Develop and manage sustainable environmental				New to PMC10

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
	practices				
MSACMT675A	Facilitate the development of a new product	MSACMT452A	PMCOPS630B	Develop a new product	Replacement but not equivalent
MSACMT681A	Develop a proactive maintenance strategy				New to PMC10
MSAENV272A	Participate in environmentally sustainable work practices		PMASUP220A	Monitor and control environmental hazards	Replacement but not equivalent
MSAENV472A	Implement and monitor environmentally sustainable work practices				New to PMC10
MSAENV672A	Develop workplace policy and procedures for sustainability				New to PMC10
MSAPMOHS110A	Follow emergency response procedures		PMAOHS110B	Respond to emergency situation	Equivalent
MSAPMOHS200A	Work safely		PMAOHS200B	Participate in workplace safety procedures	Equivalent
MSAPMOHS300A	Facilitate the implementation of OHS for a work group	MSAPMOHS200A	PMAOHS300B	Implement and monitor OHS policies and procedures for a	Equivalent

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
				work group	
MSAPMOHS400A	Contribute to OHS management system	MSAPMOHS300A	PMAOHS400B	Contribute to workplace OHS management system	Equivalent
MSAPMOHS401A	Assess risk		PMAOHS401B	Assess risk	Equivalent
MSAPMOHS503A	Maintain the workplace OHS management system		PMAOHS503A	Maintain the workplace OHS management system	Equivalent
MSAPMOHS510A	Manage risk		PMAOHS510B	Manage risk	Not equivalent - changed prerequisite
MSAPMOHS601A	Establish workplace OHS management system	MSAPMOHS503A	PMAOHS601A	Establish workplace OHS management system	Equivalent
MSAPMOPS100A	Use equipment		PMCOPS103B	Operate equipment	Equivalent
MSAPMOPS101A	Make measurements		PMAPROC101B	Make measurements	Equivalent
MSAPMOPS200A	Operate equipment		PMCOPS201B	Operate a unit of equipment	Equivalent
MSAPMOPS212A	Use enterprise computers or data systems		PMAOPS212A	Use enterprise data system	Equivalent
MSAPMOPS400A	Optimise process/plant area	MSAPMSUP390A	PMCOPS400B	Optimise process systems	Not equivalent - changed prerequisite

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
MSAPMOPS401A	Trial new process or product		PMAOPS401B	Trial new process/product	Not equivalent - changed prerequisite
MSAPMOPS404A	Coordinate maintenance				New to PMC10
MSAPMOPS405A	Identify problems in fluid power system				New to PMC10
MSAPMOPS406A	Identify problems in electronic control systems				New to PMC10
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	Not equivalent - changed prerequisite
MSAPMPER202A	Observe permit work				New to PMC10
MSAPMPER205B	Enter confined space		PMAPER205B	Enter confined space	Not equivalent - changed prerequisite
MSAPMPER300B	Issue work permits	MNMC205A	PMAPER300C	Issue work permits	Not equivalent – now includes

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
					hot and confined work
MSAPMPER400A	Coordinate permit process	MSAPMPER300B			New to PMC10
MSAPMSUP100A	Apply workplace procedures		PMASUP100B	Apply workplace procedures	Equivalent
MSAPMSUP101A	Clean workplace or equipment		PMCCOR102A	Clean plant and equipment	Equivalent
MSAPMSUP102A	Communicate in the workplace		PMASUP110A	Relay and respond to information	Equivalent
MSAPMSUP106A	Work in a team		PMCSUP181A	Work in a team	Equivalent
MSAPMSUP200A	Achieve work outcomes		PMASUP200B	Implement production efficiencies	Not equivalent changed prerequisite
MSAPMSUP201A	Receive or despatch goods		PMCSUP273A	Receive and despatch materials	Equivalent
MSAPMSUP210A	Process and record information		PMASUP210A	Process and record information	Not equivalent - changed prerequisite
MSAPMSUP230A	Monitor process operations		PMBPROD230B	Monitor process operations	Equivalent
MSAPMSUP240A	Undertake minor maintenance		PMCSUP274B	Undertake minor maintenance	Equivalent
MSAPMSUP2	Manage conflict		PMCSUP28	Manage conflict	Equivalent

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
80A	at work		0A	at work	t
MSAPMSUP292A	Sample and test materials and product		PMCSUP292A	Sample and test materials and product	Equivalent
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	MSAPMSUP200A	PMASUP300B	Identify and implement opportunities to maximise production efficiencies	Equivalent
MSAPMSUP303A	Identify equipment faults				New to PMC10
MSAPMSUP310A	Contribute to development of plant documentation		PMACOM300A	Contribute to the development of plant documentation	Equivalent
MSAPMSUP330A	Develop and adjust a production schedule		PMASUP330B	Schedule production	Not equivalent - changed prerequisite
MSAPMSUP382A	Provide coaching/mentoring in the workplace		PMCSUP382A	Provide coaching/mentoring in the workplace	Equivalent
MSAPMSUP390A	Use structured problem solving tools		PMASUP390A	Use structured problem solving tools	Equivalent
MSL916005A	Manage complex projects			New to PMC10	
MSL952001A	Collect routine site samples		PMCSUP391A	Collect and prepare standard samples	Equivalent
MSL973001A	Perform basic		PMCSUP39	Perform basic	Replacement

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
	tests		2A	laboratory tests	ent but not equivalent
MSL974005A	Perform physical tests		PMCOPS390A	Test refractory materials	Replacement but not equivalent
PMAOPS101C	Read dials and indicators		PMAOPS101B	Read dials and indicators	Equivalent
PMAOPS105C	Select and prepare materials		PMAOPS105B	Select and prepare materials	Equivalent
PMAOPS216B	Operate local control system		PMAOPS216A	Operate local control system	Equivalent
PMAOPS305B	Operate process control systems		PMCOPS301B	Operate centralised process control systems	Not equivalent – changed prerequisite
PMAOPS402A	Respond to abnormal process situations	MSAPMSUP390A			New to PMC10
PMAOPS405A	Operate complex control systems				New to PMC10
PMAOPS500A	Optimise production systems				New to PMC10
PMAOPS501A	Provide operational expertise to a project team				New to PMC10

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
PMAOPS505 A	Control the process during abnormal situations				New to PMC10
PMAOPS511 B	Determine energy transfer loads		PMAOPS511A	Determine energy transfer loads	Equivalent
PMAOPS512 B	Determine mass transfer loads		PMAOPS512A	Determine mass transfer loads	Equivalent
PMAOPS520 C	Manage utilities		PMAOPS520B	Manage utilities	Equivalent
PMAOPS521 C	Plan plant shutdown		PMAOPS521B	Plan plant shutdown	Not equivalent - changed prerequisite
PMAOPS522 A	Coordinate plant shutdown				New to PMC10
PMAOPS600 C	Modify plant		PMAOPS600B	Modify plant	Not equivalent - changed prerequisite
PMAOPS601 A	Debottleneck plant				New to PMC10
PMASUP420 B	Minimise environmental impact of process		PMASUP420A	Minimise environmental impact of process	Not equivalent - changed prerequisite
PMASUP520 B	Review procedures to minimise environmental		PMASUP520A	Review procedures to minimise environmental	Not equivalent - changed

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
	impact of process			impact of process	prerequisite
PMBHAN103C	Shift materials safely by hand		PMCSUP170B	Shift materials safely	Replacement but not equivalent
PMBTECH502B	Review and analyse production trials and specify retrials		PMBTECH502B	Review and analyse production trials and specify retrials	Equivalent
PMC552002C	Operate equipment to blend/mix materials		PMCOPS202B	Operate equipment to blend/mix materials	Equivalent
PMC552003C	Operate grinding equipment		PMCOPS203B	Operate grinding equipment	Equivalent
PMC552004C	Prepare for production		PMCOPS204B	Prepare for production	Equivalent
PMC552005C	Process greenware/green products		PMCOPS205B	Process greenware/green products	Equivalent
PMC552006C	Operate an autoclave		PMCOPS206B	Operate an autoclave	Equivalent
PMC552007B	Heat accelerate the curing of precast concrete		PMCOPS207A	Heat accelerate the curing of precast concrete	Equivalent
PMC552008B	Operate crushing equipment		PMCOPS208A	Operate crushing equipment	Equivalent
PMC552010C	Operate a calcining kiln		PMCOPS210B	Operate a Calcining kiln	Equivalent
PMC552020C	Operate slip		PMCOPS22	Operate slip	Equivalent

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
	casting equipment		0B	casting equipment.	t
PMC552021C	Operate manual glazing equipment		PMCOPS22 1B	Operate manual glazing equipment	Equivalent
PMC552022C	Prepare materials for clay and ceramic production		PMCOPS22 2B	Prepare materials for clay and ceramic production	Equivalent
PMC552023C	Finish products after firing		PMCOPS22 3B	Finish products after firing	Equivalent
PMC552024C	Hand mould products		PMCOPS22 4B	Hand mould products	Equivalent
PMC552030C	Operate a firing kiln		PMCOPS23 0B	Operate a firing kiln	Equivalent
PMC552031C	Operate extrusion equipment		PMCOPS23 1B	Operate extrusion equipment	Equivalent
PMC552032C	Operate pressing equipment		PMCOPS23 2B	Operate pressing equipment	Equivalent
PMC552040C	Operate glass melting process		PMCOPS24 0B	Operate melting process	Equivalent
PMC552041C	Operate process ovens		PMCOPS24 1B	Operate process ovens	Equivalent
PMC552042C	Operate blown insulation equipment		PMCOPS24 2B	Operate blown insulation equipment	Equivalent
PMC552043C	Operate float forming equipment		PMCOPS24 3B	Operate float forming equipment	Equivalent
PMC552044C	Operate fibre forming equipment		PMCOPS24 4B	Operate fibre forming equipment	Equivalent

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
PMC552045C	Operate container forming equipment		PMCOPS245B	Operate container forming equipment	Equivalent
PMC552046C	Operate glass printing equipment		PMCOPS246B	Operate glass printing equipment	Equivalent
PMC552047C	Operate primary annealing equipment		PMCOPS247B	Operate primary annealing equipment	Equivalent
PMC552048C	Operate glass finishing equipment		PMCOPS248B	Operate glass finishing equipment	Equivalent
PMC552049C	Operate on-line stacking and assembly equipment		PMCOPS249B	Operate on-line stacking and assembly equipment	Equivalent
PMC552050C	Schedule, cut and bend reinforcement		PMCOPS250B	Schedule, cut and bend reinforcement	Equivalent
PMC552051C	Finish green concrete products		PMCOPS251B	Finish green concrete products	Equivalent
PMC552052C	Cast moulded concrete products		PMCOPS252B	Cast moulded concrete products	Equivalent
PMC552053C	Finish cured concrete products		PMCOPS253B	Finish cured concrete products	Equivalent
PMC552054C	Spin concrete pipes		PMCOPS254B	Spin concrete pipes	Equivalent
PMC552055C	Conduct benching operations		PMCOPS255B	Conduct benching operations	Equivalent

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
PMC552056B	Assemble, fabricate and place reinforcement		PMCOPS256A	Assemble, fabricate and place reinforcement	Equivalent
PMC552057B	Finish casting operation		PMCOPS257A	Finish casting operation	Equivalent
PMC552058B	Demould concrete products		PMCOPS258A	Demould concrete products.	Equivalent
PMC552060C	Batch mix concrete		PMCOPS260B	Batch mix concrete	Equivalent
PMC552061C	Deliver concrete to site		PMCOPS261B	Deliver concrete to site	Prerequisite changed to co-requisite. References to driving trucks removed.
PMC552065B	Prepare asphalt		PMCOPS265A	Prepare asphalt	Equivalent
PMC552070B	Operate forming equipment		PMCOPS270A	Operate forming equipment	Equivalent
PMC552071B	Operate wet and dry end equipment		PMCOPS271A	Operate wet and dry end equipment	Equivalent
PMC552072B	Produce fibrous plasterboard		PMCOPS272A	Produce fibrous plasterboard	Equivalent
PMC552090B	Use and maintain tools and equipment for refractory operations		PMCOPS290A	Use and maintain tools and equipment for refractory operations	Equivalent

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
PMC552091B	Prepare for, install and repair refractory brickwork/block work		PMCOPS291A	Prepare for, install and repair refractory brickwork/block work	Equivalent
PMC552092B	Prepare for and install mouldable refractory materials		PMCOPS292A	Prepare for and install mouldable refractory materials	Equivalent
PMC552093B	Prepare for and cast refractory materials		PMCOPS293A	Prepare for and cast refractory materials	Equivalent
PMC552094B	Prepare for and apply shotcrete for installation		PMCOPS294A	Prepare for and apply shotcrete for installation	Equivalent
PMC552095B	Prepare for, install and repair ceramic fibre		PMCOPS295A	Prepare for, install and repair ceramic fibre	Equivalent
PMC553000C	Set up and tune a process		PMCOPS300B	Set up and tune a process	Not equivalent - changed prerequisite
PMC553010C	Process raw meal into product	PMC552010C	PMCOPS310B	Process raw meal into product	Equivalent
PMC553020C	Prepare moulds and dies		PMCOPS320B	Prepare moulds and dies	Equivalent
PMC553021C	Set up and tune glazing equipment		PMCOPS321B	Set up and tune glazing equipment	Equivalent
PMC553040C	Set up and optimise glass forming process		PMCOPS340B	Set up and optimise glass forming process	Not equivalent - changed

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
					prerequisite
PMC553041C	Set up and optimise glass furnace process		PMCOPS341B	Set up and optimise glass furnace process	Equivalent
PMC553042C	Set up and optimise secondary process		PMCOPS342B	Set up and optimise secondary process	Not equivalent - changed prerequisite
PMC553050C	Produce architectural precast concrete		PMCOPS350B	Produce architectural precast concrete	Not equivalent - changed prerequisite
PMC553051B	Produce structural precast concrete		PMCOPS351A	Produce structural precast concrete	Not equivalent - changed prerequisite
PMC553070B	Design and construct moulds for fibrous plaster products	PMC552024C	PMCOPS370A	Design and construct moulds for fibrous plaster products	Equivalent
PMC553072B	Model fibrous plaster products		PMCOPS372A	Model fibrous plaster products	Equivalent
PMC553080B	Set up and optimise finishing process		PMCOPS380A	Set up and optimise finishing process	Not equivalent - changed prerequisite
PMC554020D	Design and prepare models,		PMCOPS42	Design and prepare models,	Equivalent

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
	moulds and dies		0C	moulds and dies	t
PMC554090B	Undertake simple refractory design		PMCOPS490A	Undertake simple refractory design	Equivalent
PMC554091B	Analyse refractory failures		PMCOPS491A	Analyse refractory failures	Equivalent
PMC555030C	Analyse equipment performance		PMCOPS530B	Analyse equipment performance	Not equivalent - changed prerequisite
PMC555031B	Choose materials for an application		PMCOPS531A	Choose materials for an application	Equivalent
PMC556031C	Design structural/mechanical components	PMC555031A	PMCOPS631B	Design structural/mechanical components	Equivalent
PMC557001A	Manage trials				New to PMC10
PMC557090A	Select refractory materials for an application				New to PMC10
PMC557091A	Design a refractory lining				New to PMC10
PMC557092A	Specify and interpret refractory tests				New to PMC10
PMC557093A	Design a refractory/ceramic component				New to PMC10
PMC557094A	Investigate				New to

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
	refractory failures				PMC10
PMC557095A	Specify and monitor the installation of monolithic/castable refractories				New to PMC10
PMC557096A	Specify and monitor the installation of block/precast refractories				New to PMC10
PMC557097A	Specify and monitor repairs to refractory installations				New to PMC10
PMC557098A	Specify refractory installation systems				New to PMC10
PMC561072C	Store materials for production		PMCSUP172B	Store materials for production	Equivalent
PMC561080B	Organise self		PMCSUP180A	Organise self	Equivalent
PMC562070B	Move materials		PMCSUP270A	Move materials	Equivalent
PMC562071C	Operate bulk materials handling equipment		PMCSUP271B	Operate bulk materials handling equipment	Equivalent
PMC562075B	Maintain kiln refractory		PMCSUP275A	Maintain kiln refractory	Equivalent
PMC562081B	Deliver customer service		PMCSUP281A	Deliver customer service	Not equivalent - changed

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
					prerequisite
PMC562083C	Allocate and complete team tasks		PMCSUP283B	Allocate and complete team tasks	Equivalent
PMC563081C	Carry out stock control		PMCSUP381B	Carry out stock control	Equivalent
PSPPM402B	Manage simple projects				New to PMC10
PSPPM502B	Manage complex projects		PSPPM502A	Manage projects	Equivalent
TAAASS301B	Contribute to assessment			New to PMC10	
TAAASS401C	Plan and organise assessment		BSZ401A	Plan assessment	Equivalent
TAAASS402C	Assess competence		BSZ402A	Conduct assessment	Equivalent
TAAASS403B	Develop assessment tools				New to PMC10
TAAASS404B	Participate in assessment validation	TAAASS402B	BSZ403A	Review assessment	Not equivalent
TAADEL301CA	Provide training through instruction and demonstration of work skills				New to PMC10
TLIC307C	Drive medium rigid vehicle				New to PMC10
TLIC407D	Drive heavy rigid vehicle		TDTC497C	Drive heavy rigid vehicle	Equivalent

PMC10 Unit Code	Title	Prerequisites	PMC04 Unit Code	Title	Comment
TLIC507D	Drive heavy combination vehicle				New to PMC10
TLID1007C	Operate a forklift		TDTD1097B	Operate a forklift	Equivalent

Mapping of PMC04 to PMC10

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
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			Not carried forward

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
	information system			
BSBFLM409A	Implement continuous improvement			Not carried forward
BSBFLM504A	Facilitate work teams			Not carried forward
BSBFLM505A	Manage operational plan			Not carried forward
BSBFLM509A	Promote continuous improvement			Not carried forward
BSBFLM510A	Facilitate and capitalise on change and innovation			Not carried forward
BSBFLM511A	Develop a workplace learning environment			Not carried forward
BSZ401A	Plan assessment	TAAASS401A	Plan and organise assessment	Equivalent
BSZ402A	Conduct assessment	TAAASS402A	Assess competence	Equivalent
BSZ403A	Review assessment	TAAASS404A	Participate in assessment validation	Not equivalent
BSZ404A	Train small groups			Not carried forward
LMTEMGN06A	Design equipment and system modifications			Not carried forward
LMTEMGN07A	Manage installation and commissioning of equipment and systems	LMTGN5004A	Manage installation and commissioning of equipment and systems	Equivalent
LMTPDHL06A	Manage product development			Not carried forward

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
	projects			
PMACOM300A	Contribute to the development of plant documentation			Not carried forward
PMAOHS100B	Follow OHS procedures			Not carried forward
PMAOHS110B	Respond to emergency situation	MSAPMOHS110A	Follow emergency response procedures	Equivalent
PMAOHS200B	Participate in workplace safety procedures	MSAPMOHS200A	Work safely	Equivalent
PMAOHS300B	Implement and monitor OHS policies and procedures for a work group	MSAPMOHS300A	Facilitate the implementation of OHS for a work group	Equivalent
PMAOHS400B	Contribute to workplace OHS management system	MSAPMOHS400A	Contribute to OHS management system	Equivalent
PMAOHS401B	Assess risk	MSAPMOHS401A	Assess risk	Equivalent
PMAOHS503A	Maintain the workplace OHS management system	MSAPMOHS503A	Maintain the workplace OHS management system	Equivalent
PMAOHS510B	Manage risk	MSAPMOHS510A	Manage risk	Not equivalent - changed prerequisite
PMAOHS601A	Establish workplace OHS management system	MSAPMOHS601A	Establish workplace OHS management system	Not equivalent - changed prerequisite
PMAOPS101B	Read dials and indicators	PMAOPS101C	Read dials and indicators	Equivalent

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
PMAOPS212A	Use enterprise data system	MSAPMOPS212A	Use enterprise computers or data systems	Equivalent
PMAOPS216A	Operate local control system	PMAOPS216B	Operate local control system	Equivalent
PMAOPS401B	Trial new process/product	MSAPMOPS401A	Trial new process or product	Not equivalent - changed prerequisite
PMAOPS511A	Determine energy transfer loads	PMAOPS511B	Determine energy transfer loads	Equivalent
PMAOPS512A	Determine mass transfer loads	PMAOPS512B	Determine mass transfer loads	Equivalent
PMAOPS520B	Manage utilities	PMAOPS520C	Manage utilities	Equivalent
PMAOPS521B	Plan plant shutdown	PMAOPS521C	Plan plant shutdown	Not equivalent - changed prerequisite
PMAOPS600B	Modify plant	PMAOPS600C	Modify plant	Not equivalent - changed prerequisite
PMAPER200C	Work in accordance with an issued permit	MSAPMPER200B	Work in accordance with an issued permit	Equivalent
PMAPER201C	Monitor and control work permits	MSAPMPER201A	Monitor and control work permits	Not equivalent - changed prerequisite
PMAPER205B	Enter confined space	MSAPMPER205B	Enter confined space	Not equivalent - changed prerequisite
PMAPER300C	Issue work permits	MSAPMPER300	Issue work permits	Equivalent

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
		B		
PMAPER302B	Issue work permits (hot work/confined space)		Not carried forward	
PMAPROC101 B	Make measurements	MSAPMOPS101 A	Make measurements	Equivalent
PMASUP100B	Apply workplace procedures	MSAPMSUP100 A	Apply workplace procedures	Equivalent
PMASUP110A	Relay and respond to information	MSAPMSUP102 A	Communicate in the workplace	Equivalent
PMASUP120A	Follow environmental work practices			Not carried forward
PMASUP130B	Follow established work plan			Not carried forward
PMASUP200B	Implement production efficiencies	MSAPMSUP200 A	Achieve work outcomes	Not equivalent - changed prerequisite
PMASUP210A	Process and record information	MSAPMSUP210 A	Process and record information	Not equivalent - changed prerequisite
PMASUP220A	Monitor and control environmental hazards	MSAENV272A	Participate in environmentally sustainable work practices	Replacement but not equivalent
PMASUP300B	Identify and implement opportunities to maximise production efficiencies	MSAPMSUP300 A	Identify and implement opportunities to maximise production efficiencies	Equivalent
PMASUP320A	Implement and monitor			Not carried forward

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
	environmental policies			
PMASUP330B	Schedule production	MSAPMSUP330A	Develop and adjust a production schedule	Not equivalent - changed prerequisite
PMASUP390A	Use structured problem solving tools	MSAPMSUP390A	Use structured problem solving tools	Equivalent
PMASUP420A	Minimise environmental impact of process	PMASUP420B	Minimise environmental impact of process	Equivalent
PMASUP520A	Review procedures to minimise environmental impact of process	PMASUP520B	Review procedures to minimise environmental impact of process	Not equivalent - changed prerequisite
PMASUP620A	Manage environmental management system			Not carried forward
PMBPREP508A	Produce drawings	MEM09003B	Prepare basic engineering drawing	Replacement but not equivalent
PMBPROD230B	Monitor process operations	MSAPMSUP230A	Monitor process operations	Equivalent
PMBTECH502B	Review and analyse production trials and specify retrials	PMBTECH502B	Review and analyse production trials and specify retrials	Equivalent
PMCCOR102A	Clean plant and equipment	MSAPMSUP101A	Clean workplace or equipment	Equivalent
PMCOPS103B	Operate equipment	MSAPMOPS100A	Use equipment	Equivalent
PMCOPS201B	Operate a unit of equipment	MSAPMOPS200A	Operate equipment	Equivalent
PMCOPS202B	Operate equipment	PMC552002C	Operate equipment	Equivalent

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
	to blend/mix materials		to blend/mix materials	
PMCOPS203B	Operate grinding equipment	PMC552003C	Operate grinding equipment	Equivalent
PMCOPS204B	Prepare for production	PMC552004C	Prepare for production	Equivalent
PMCOPS205B	Process greenware/green products	PMC552005C	Process greenware/green products	Equivalent
PMCOPS206B	Operate an autoclave	PMC552006C	Operate an autoclave	Equivalent
PMCOPS207A	Heat accelerate the curing of precast concrete	PMC552007B	Heat accelerate the curing of precast concrete	Equivalent
PMCOPS208A	Operate crushing equipment	PMC552008B	Operate crushing equipment	Equivalent
PMCOPS210B	Operate a Calcining kiln	PMC552010C	Operate a calcining kiln	Equivalent
PMCOPS220B	Operate slip casting equipment	PMC552020C	Operate slip casting equipment	Equivalent
PMCOPS221B	Operate manual glazing equipment	PMC552021C	Operate manual glazing equipment	Equivalent
PMCOPS222B	Prepare materials for clay and ceramic production	PMC552022C	Prepare materials for clay and ceramic production	Equivalent
PMCOPS223B	Finish products after firing	PMC552023C	Finish products after firing	Equivalent
PMCOPS224B	Hand mould products	PMC552024C	Hand mould products	Equivalent
PMCOPS230B	Operate a firing kiln	PMC552030C	Operate a firing kiln	Equivalent
PMCOPS231B	Operate extrusion equipment	PMC552031C	Operate extrusion equipment	Equivalent

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
PMCOPS232B	Operate pressing equipment	PMC552032C	Operate pressing equipment	Equivalent
PMCOPS240B	Operate melting process	PMC552040C	Operate melting process	Equivalent
PMCOPS241B	Operate process ovens	PMC552041C	Operate process ovens	Equivalent
PMCOPS242B	Operate blown insulation equipment	PMC552042C	Operate blown insulation equipment	Equivalent
PMCOPS243B	Operate float forming equipment	PMC552043C	Operate float forming equipment	Equivalent
PMCOPS244B	Operate fibre forming equipment	PMC552044C	Operate fibre forming equipment	Equivalent
PMCOPS245B	Operate container forming equipment	PMC552045C	Operate container forming equipment	Equivalent
PMCOPS246B	Operate glass printing equipment	PMC552046C	Operate glass printing equipment	Equivalent
PMCOPS247B	Operate primary annealing equipment	PMC552047C	Operate primary annealing equipment	Equivalent
PMCOPS248B	Operate glass finishing equipment	PMC552048C	Operate glass finishing equipment	Equivalent
PMCOPS249B	Operate on-line stacking and assembly equipment	PMC552049C	Operate on-line stacking and assembly equipment	Equivalent
PMCOPS250B	Schedule, cut and bend reinforcement	PMC552050C	Schedule, cut and bend reinforcement	Equivalent
PMCOPS251B	Finish green concrete products	PMC552051C	Finish green concrete products	Equivalent
PMCOPS252B	Cast moulded concrete products	PMC552052C	Cast moulded concrete products	Equivalent
PMCOPS253B	Finish cured	PMC552053C	Finish cured	Equivalent

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
	concrete products		concrete products	
PMCOPS254B	Spin concrete pipes	PMC552054C	Spin concrete pipes	Equivalent
PMCOPS255B	Conduct benching operations	PMC552055C	Conduct benching operations	Equivalent
PMCOPS256A	Assemble, fabricate and place reinforcement	PMC552056B	Assemble, fabricate and place reinforcement	Equivalent
PMCOPS257A	Finish casting operation	PMC552057B	Finish casting operation	Equivalent
PMCOPS258A	Demould concrete products	PMC552058B	Demould concrete products	Equivalent
PMCOPS260B	Batch mix concrete	PMC552060C	Batch mix concrete	Equivalent
PMCOPS261B	Deliver concrete to site	PMC552061C	Deliver concrete to site	Prerequisite changed to co-requisite. References to driving trucks removed
PMCOPS265A	Prepare asphalt	PMC552065B	Prepare asphalt	Equivalent
PMCOPS270A	Operate forming equipment	PMC552070B	Operate forming equipment	Equivalent
PMCOPS271A	Operate wet and dry end equipment	PMC552071B	Operate wet and dry end equipment	Equivalent
PMCOPS272A	Produce fibrous plasterboard	PMC552072B	Produce fibrous plasterboard	Equivalent
PMCOPS290A	Use and maintain tools and equipment for refractory operations	PMC552090B	Use and maintain tools and equipment for refractory operations	Equivalent
PMCOPS291A	Prepare for, install and repair refractory brickwork/blockwork	PMC552091B	Prepare for, install and repair refractory brickwork/blockwork	Equivalent

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
	k		k	
PMCOPS292A	Prepare for and install mouldable refractory materials	PMC552092B	Prepare for and install mouldable refractory materials	Equivalent
PMCOPS293A	Prepare for and cast refractory materials	PMC552093B	Prepare for and cast refractory materials	Equivalent
PMCOPS294A	Prepare for and apply shotcrete for installation	PMC552094B	Prepare for and apply shotcrete for installation	Equivalent
PMCOPS295A	Prepare for, install and repair ceramic fibre	PMC552095B	Prepare for, install and repair ceramic fibre	Equivalent
PMCOPS300B	Set up and tune a process	PMC553000C	Set up and tune a process	Not equivalent - changed prerequisite
PMCOPS301B	Operate centralised process control systems	PMAOPS305B	Operate process control systems	Not equivalent - changed prerequisite
PMCOPS310B	Process raw meal into product	PMC553010C	Process raw meal into product	Equivalent
PMCOPS320B	Prepare moulds and dies	PMC553020C	Prepare moulds and dies	Equivalent
PMCOPS321B	Set up and tune glazing equipment	PMC553021C	Set up and tune glazing equipment	Equivalent
PMCOPS340B	Set up and optimise glass forming process	PMC553040C	Set up and optimise glass forming process	Not equivalent - changed prerequisite
PMCOPS341B	Set up and optimise glass furnace process	PMC553041C	Set up and optimise glass furnace process	Equivalent
PMCOPS342B	Set up and optimise	PMC553042C	Set up and optimise	Not

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
	secondary process		secondary process	equivalent - changed prerequisite
PMCOPS350B	Produce architectural precast concrete	PMC553050C	Produce architectural precast concrete	Not equivalent - changed prerequisite
PMCOPS351A	Produce structural precast concrete	PMC553051B	Produce structural precast concrete	Not equivalent - changed prerequisite
PMCOPS370A	Design and construct moulds for fibrous plaster products	PMC553070B	Design and construct moulds for fibrous plaster products	Equivalent
PMCOPS372A	Model fibrous plaster products	PMC553072B	Model fibrous plaster products	Equivalent
PMCOPS380A	Set up and optimise finishing process	PMC553080B	Set up and optimise finishing process	Not equivalent - changed prerequisite
PMCOPS390A	Test refractory materials	MSL974005A	Perform physical tests	Replacement but not equivalent
PMCOPS400B	Optimise process systems	MSAPMOPS400A	Optimise process/plant area	Not equivalent - changed prerequisite
PMCOPS420B	Design and prepare models, moulds and dies	PMC554020D	Design and prepare models, moulds and dies	Equivalent
PMCOPS490A	Undertake simple refractory design	PMC554090B	Undertake simple refractory design	Equivalent
PMCOPS491A	Analyse refractory failures	PMC554091B	Analyse refractory failures	Equivalent

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
PMCOPS530B	Analyse equipment performance	PMC555030C	Analyse equipment performance	Not equivalent - changed prerequisite
PMCOPS531A	Choose materials for an application	PMC555031B	Choose materials for an application	Equivalent
PMCOPS630B	Develop a new product	MSACMT675A	Facilitate the development of a new product	Replacement but not equivalent
PMCOPS631B	Design structural/mechanical components	PMC556031C	Design structural/mechanical components	Equivalent
		PMC557001A	Manage trials	New to PMC10
		PMC557090A	Select refractory materials for an application	New to PMC10
		PMC557091A	Design a refractory lining	New to PMC10
		PMC557092A	Specify and interpret refractory tests	New to PMC10
		PMC557093A	Design a refractory/ceramic component	New to PMC10
		PMC557094A	Investigate refractory failures	New to PMC10
		PMC557095A	Specify and monitor the installation of monolithic/castable refractories	New to PMC10
		PMC557096A	Specify and monitor the installation of block/precast	New to PMC10

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
			refractories	
		PMC557097A	Specify and monitor repairs to refractory installations	New to PMC10
		PMC557098A	Specify refractory installation systems	New to PMC10
PMCSUP170B	Shift materials safely	PMBHAN103C	Shift materials safely by hand	Equivalent
PMCSUP171B	Pack finished products			Not carried forward
PMCSUP172B	Store materials for production	PMC561072C	Store materials for production	Equivalent
PMCSUP180A	Organise self	PMC561080B	Organise self	Equivalent
PMCSUP181A	Work in a team	MSAPMSUP106 A	Work in a team	Equivalent
PMCSUP270A	Move materials	PMC562070B	Move materials	Equivalent
PMCSUP271B	Operate bulk materials handling equipment	PMC562071C	Operate bulk materials handling equipment	Equivalent
PMCSUP272A	Identify and act upon hazards in the workplace			Not carried forward
PMCSUP273A	Receive and despatch materials	MSAPMSUP201 A	Receive or despatch goods	Equivalent
PMCSUP274B	Undertake minor maintenance	MSAPMSUP240 A	Undertake minor maintenance	Equivalent
PMCSUP275A	Maintain kiln refractory	PMC562075B	Maintain kiln refractory	Equivalent
PMCSUP280A	Manage conflict at work	MSAPMSUP280 A	Manage conflict at work	Equivalent
PMCSUP281A	Deliver customer	PMC562081B	Deliver customer	Not equivalent -

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
	service		service	changed prerequisite
PMCSUP282A	Use computers and related programs in the workplace	MSAPMOPS212A	Use enterprise computers or data systems	Equivalent
PMCSUP283B	Allocate and complete team tasks	PMC562083C	Allocate and complete team tasks	Equivalent
PMCSUP292A	Sample and test materials and product	MSAPMSUP292A	Sample and test materials and product	Equivalent
PMCSUP380B	Oversee team performance		Not carried forward	
PMCSUP381B	Carry out stock control	PMC563081C	Carry out stock control	Equivalent
PMCSUP382A	Provide coaching/mentoring in the workplace	MSAPMSUP382A	Provide coaching/mentoring in the workplace	Equivalent
PMCSUP391A	Collect and prepare standard samples	MSL952001A	Collect routine site samples	Replacement but not equivalent
PMCSUP392A	Perform basic laboratory tests	MSL973001A	Perform basic tests	Replacement but not equivalent
PMCSUP393A	Perform instrumental analysis			Not carried forward
PSPPM502A	Manage projects	PSPPM502B	Manage complex projects	Equivalent
		TLIC307C	Drive medium rigid vehicle	New to PMC10
TDTC497C	Drive heavy rigid vehicle	TLIC407D	Drive heavy rigid vehicle	Equivalent
		TLIC507D	Drive heavy	New to

PMC04 Unit Code	Title	PMC10 Unit Code	Title	Comment
			combination vehicle	PMC10
TDTD1097B	Operate a forklift	TLID1007C	Operate a forklift	Equivalent

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 peoples 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?

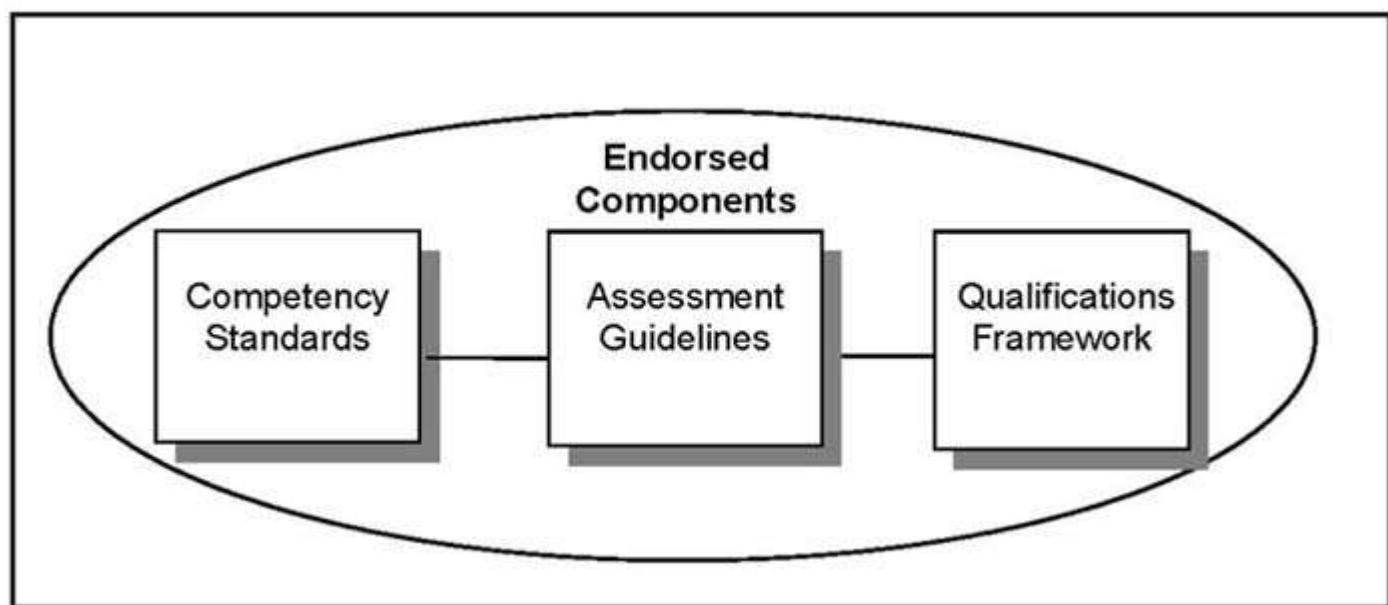
Training and assessment using Training Packages must be conducted by a Registered Training Organisation (RTO) that has the qualifications or specific units of competency on its scope of registration, or that works in partnership with another RTO, as specified in the AQTF 2007.

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.

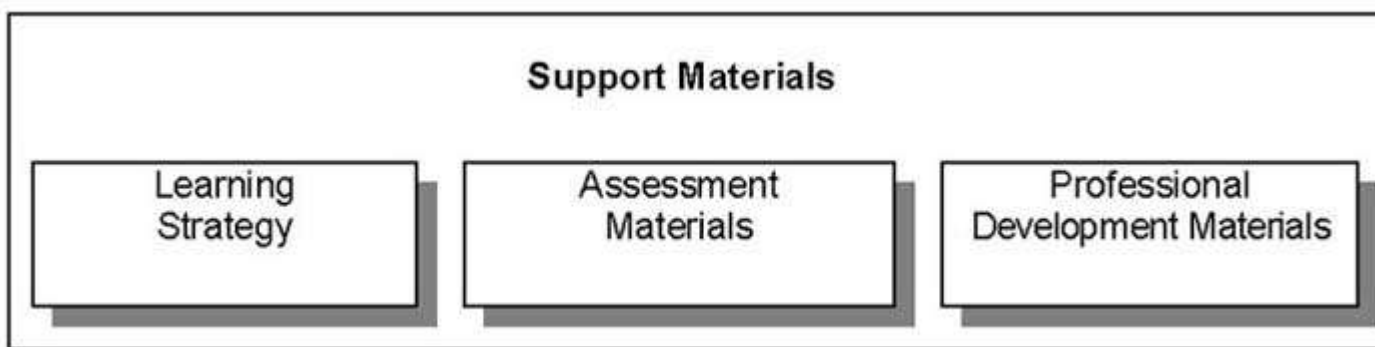
Qualifications Framework

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 PMC10. 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 PMC20110. 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 PMC557001A;
- the first three characters signify the Training Package - PMC10 - 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:

- PMC20110 Certificate II in Manufactured Mineral Products

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:

- PMC552002C Operate equipment to blend/mix materials

Historical and General Information

Historical and General Information

Development of the Manufactured Mineral Products Training Package

PMC99

The original Manufactured Mineral Products Training Package was developed by Manufacturing Learning Australia (MLA) 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 1998. The Training Package was endorsed by the National Training Framework Committee (NTFC) on 22/6/99 and agreed by all State and Territory ministers on 7/7/99.

ANTA also funded the Office of Technical and Further Education of Victoria to develop an implementation guide (now called a purchasing guide). This became available in late 1999. Implementation guides (or their equivalents) became available in other States after this time. After the availability of the guides, State and Territory Industry Training Advisory Bodies began a round of implementation workshops.

PMC04

In 2003, MLA commenced an extensive review of PMC99. All units were updated for technology and policy changes and the packaging rules were revised to improve clarity.

Health, safety and environment units were imported from the PMA04 Training Package. These had all been rewritten to better align with the way jobs are done and to align with the AQF.

A new suite of quality units has been introduced to reflect the updated attitudes of the industry to quality.

PMC10

In 2005, the process manufacturing industry coverage was transferred to the National Manufacturing Industry Skills Council (Manufacturing Skills Australia). Following a review of uptake and implementation of PMC04, and as part of MSA's Continuous Improvement Plan, Kevin Hummel of Total Training and Performance Solutions (TaPS) was commissioned to undertake a Scoping Study in 2008 to inform the continuous improvement of the Manufactured Mineral Products Training Package. The Scoping Study Report noted that:

- users of PMC04 were generally happy with the package, with some integrating it into their own internal structures
- there were some areas, such as process control, which were in need of updating due to changes in technology
- there may be a need for a Vocational Graduate qualification in some sub-sectors
- the adoption of the Certificates in Process Manufacturing (within MSA07) to replace the existing PMC Certificates in Production Support was supported.

MSA supported the findings and contracted TaPS to undertake the agreed

Historical and General Information

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

Some sectors are energy intensive and will be impacted by any Carbon Pollution Reduction Scheme/Emissions Trading Scheme (eg cement/lime, glass and heavy clay). This was subject to further consultation as part of this project. The outcome of this specific investigation showed that the existing units were sufficiently forward looking to cover the expected skills needs for these sectors. This may change when an actual CPRS/ETS or other revised scheme is actually introduced.

There has been significant technological change in the field of process control. This issue had also confronted the review of the PMA Training Package which led to PMA08 Chemicals, Hydrocarbon and Refining Training Package. As the process control systems and issues are similar, the revised PMA08 process control units were proposed to a PMC expert group who concluded they were appropriate for inclusion within PMC10.

As the workforce matures and senior personnel retire, there is a growing need for the high level skills which are specific to this sector. While these skills may be touched on by typical degree courses they do not cover the specifics of this sector in sufficient detail. There was specific consultation with the sub-sectors of cement, concrete and refractories. While all agreed that there was a skills need, only refractories saw it as a current priority and so this led to a Vocational Graduate Certificate in Refractories Engineering being developed. The cement and concrete sub-sectors should be revisited in twelve months in this regard.

Refer to the Appendices for information on consultation and validation and who was involved in the development of PMC10, and impact of changes.

Introduction to the Industry

Introduction to the Industry

Manufacturing Skills Australia

Manufacturing Skills Australia (MSA) is the national industry skills council representing the manufacturing industries. Its coverage includes the process manufacturing sectors of:

- chemical, hydrocarbons and oil refining (ANZSIC classification 12 and 251 to 254) covered by the Chemical, Hydrocarbons and Refining Training Package
- iron and steel (ANZSIC classification 271) – currently no Training Package
- manufactured mineral products (statistically the non-metallic minerals sector ANZSIC classification 26) covered by the Manufactured Mineral Products Training Package
- plastics, rubber and cabling (ANZSIC classifications 255 and 2852) covered by the Plastics, Rubber and Cabling Training Package.

The process manufacturing industries have common boundaries with the extractive industries on the upstream end and the automotive, general manufacturing, building and construction, and food and beverage industries on the downstream end. 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.

The manufactured mineral products industry

This diverse industry typically interfaces with the extractive industries upstream, although some companies are also involved in the extractive industries. The industry produces a range of products which are typically used by other industries rather than directly consumed by the public. Downstream industries include building and construction (cement, concrete products, glass, clay and ceramic, fibre cement products), civil construction (cement, concrete products, asphalt), food and beverage (glass bottles and jars), heavy industry (refractories), automotive industry (glass) and landscaping industry (concrete blocks and pavers). Parts of the industry do directly service the consumer market such as ceramics (bathroom ware, dinner sets) and concrete products (blocks, pavers, gnomes and bird baths).

The industry has a large and significant ‘related products’ group (statistically ‘not elsewhere classified’). This sector covers a range from making refractory products for use by heavy industry (iron/steel, non-ferrous metals, automotive engines etc), through fibre cement (building products) to abrasives and the manufacture of talcum powder.

Contribution to the economy

One measure of Gross Domestic Product (GDP) is ‘industry value added’ (IVA). In the Financial Year ending June 2007, the Manufactured mineral products industry

Introduction to the Industry

contributed over \$5 billion to the Australian economy. The Glass and Glass Product Manufacturing sector was the leading sector, contributing \$964 million to the Australian economy in 2006 – 07.

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

Qualification Pathways

PMC10 Packaging advice

General advice

Qualifications may be awarded by a Registered Training Organisation (RTO) when competency has been achieved in the units that meet the specified packaging requirements. Units of competency achieved which do not combine to make a certificate may be recognised by a Statement of Attainment issued by an RTO.

In the PMC10 qualifications, units have been categorised into core, specialist electives and other electives. To be awarded a qualification, competence must be demonstrated in:

- all core units for that certificate, plus
- a minimum, specified number of specialist electives, plus
- units chosen from other electives (this includes other units from this Training Package, other endorsed Training Packages and accredited courses)

The packaging has been designed to cater for enterprises and learners in different industry contexts. Different operations units must be chosen for the awarding of different qualifications. Learners are NOT entitled to gain multiple qualifications at the same AQF level from a single selection of units of competency.

The packaging rules aim to be as flexible as possible. Entry to any qualification may be at any level. People entering at Certificate III or IV (and above) need to meet the relevant prerequisite competencies. A person can enter a program of training at any level.

Australian Apprenticeships

All qualifications from Certificate II to Advanced Diploma are to be undertaken as part of a formal training contract with an employer under an Australian Traineeship or Apprenticeship arrangement.

VET in schools

The delivery and assessment of competencies and/or qualifications under this Training Package as appropriately designed VET in schools programs is encouraged. However due to the requirements to demonstrate competency, it would be difficult for a school to assess and award qualifications within PMC10 except in close partnership with an appropriate organisation from the industry.

The operations/technical units are likely to pose the biggest challenge for the school sector as these are related to the operation of plant, which it is unlikely that the schools would have or would wish to acquire. However they may be able to do this in partnership with a local company. In some sectors of the industry, this may be a

Qualification Pathways

practical solution. In other sectors it is less likely that the local companies will be prepared to have school students working in their workplace as they have a distinct preference for mature workers due to the OHS issues.

For these reasons it is unlikely that a VET in schools program could offer whole qualifications under this Training Package above AQF 2.

Qualification pathways

It is assumed that most people new to the industry will enter at Certificate II. Most people already established in the industry should be able to be assessed as already partly or wholly qualified at the Certificate II level and will presumably enter at their existing level and simply complete any outstanding competency requirements.

For experienced workers in the industry, it may well be appropriate for them to enter at the Certificate III (or even Certificate IV or higher) level. Entry and exit at any point is possible. People with other relevant qualifications (eg, maintenance trades) may choose to enter at higher levels (eg, Certificate IV or Diploma) but must observe competency prerequisites.

As learners progress through the available qualifications, the level of required knowledge and understanding increases both in breadth and depth. These higher level qualifications are for people specialising as technicians/technologists in the manufactured mineral products industry.

Operators who move into non-technician roles may well be better served by seeking further qualification in other areas such as frontline management, laboratory operations or the Competitive Manufacturing qualifications.

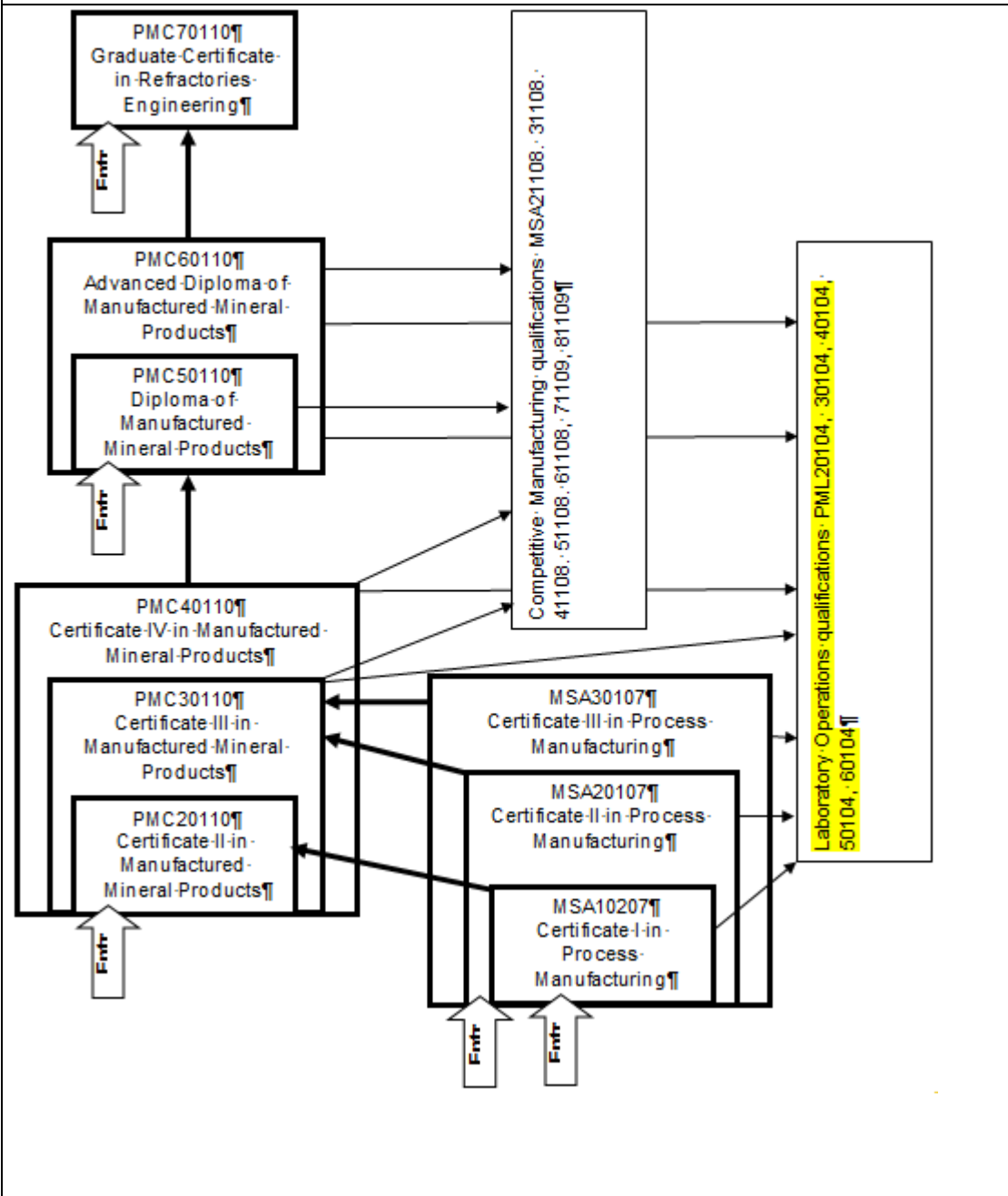
Prerequisites

Some units of competency have stated prerequisites. In any approved training scheme, it is expected that a person will be deemed competent in the prerequisite units before being assessed in the unit with the prerequisite(s). The prerequisite units must be counted towards the total number of units required. In an assessment of existing competency, it is possible to assess the unit and its prerequisites together as an integrated assessment.

PMC10 qualification pathways chart

The diagram below represents a model of the available qualifications and pathways. Refer to the individual qualifications for packaging rules.

Qualification Pathways



Industry Requirements for Employability Skills

Industry Requirements for Employability Skills

Competency Standards - Industry Contextualisation

Competency Standards - Industry Contextualisation

Contextualisation guidelines for units in this Training Package

Contextualisation of units of competency is allowed and encouraged, provided the contextualised unit is of a similar level and rigour to the original unit. This can be achieved by:

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

Note that contextualising cannot be used to generate an additional unit which is closely related to an existing unit. Contextualisation may be used to place enterprise specific information in the unit of competency, but not if this results in the use of two similar units in the one qualification.

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 range of variables and the evidence guide.

Note also that contextualisation of 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 and the enterprise
- not reduce the health, safety or environmental requirements
- retain the original code number.

Contextualising 'operations' units

Operations units may be contextualised within the bounds specified above, but are not to be substituted with other units.

The following two operations units are intended to be used primarily in a contextualised form:

- MSAPMOPS200A Operate a unit of equipment
- PMC553000C Set up and tune a process.

These two units apply to situations where no other operational unit in the Training Package is deemed to be appropriate. Both units should be contextualised to suit individual situations, within the general contextualising rules of this section. 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 qualification purposes.

Competency Standards - Industry Contextualisation

Importing competencies from other Training Packages

This Training Package contains a number of units of competency which have been imported from another Training Package (any unit whose code does not commence with PMC has been imported). These units of competency are treated as if they were PMC units from the point of view of the PMC qualifications and are included within the scope of registration for RTOs whose scope covers this Training Package.

Additional competency units may be **imported** from other endorsed Training Packages and accredited courses to customise a **qualification**. The number and type of units able to be imported to a qualification is identified in the packaging rules. Note that any prerequisites and co-requisites specified must also be imported and included in the total number required.

Exporting competencies 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 is retained
- they are only contextualised to the extent permitted as above
- any specified prerequisites and co-requisites are observed
- Manufacturing Skills Australia is advised to facilitate ongoing communication in the event of an update.

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

Examples from this Training Package of Employability Skills embedded within unit components	
Unit component	Example of embedded Employability Skill
Unit Title	Assemble, fabricate and place reinforcement (planning, technology and organising)
Unit Descriptor	This unit of competency covers the interpretation of plans (steel drawings), the fabrication of reinforcement from pre-cut and bent steel and placement of reinforcing steel cages and assemblies for manufactured concrete products. (organising, problem solving, technology)
Element	Prepare for fabrication (planning and organising) Rectify routine problems (initiative and enterprise, problem solving)
Performance Criteria	Check quantities, type, size and shape of reinforcement supplied against drawings, tags and schedules (planning, organising, self management) Identify and rectify equipment failure causes in accordance with procedures/work instructions (initiative, self management, problem solving, communication) Identify non-routine problems and report to designated person (initiative, communication, team work)
Range Statement	Where there is an apparent conflict between performance criteria and OHS requirements, the OHS requirements take precedence (learning, self management, initiative)
Required Skills and Knowledge	Skills include implementing enterprise standard procedures and work instructions and relevant

Examples from this Training Package of Employability Skills embedded within unit components	
Unit component	Example of embedded Employability Skill
	regulatory requirements within appropriate time constraints and in a manner relevant to the fabrication of reinforcement. (self management, communication, problem solving, technology)
Evidence Guide	It is essential that the reinforcement fabrication and placement process be understood and that the importance of critical material properties and specifications is known. (technology, learning, problem solving, self management)

Skill Sets in this Training Package

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 2010 edition of the AQF Implementation Handbook for advice on wording on Statements of Attainment. http://www.aqf.edu.au/Portals/0/Documents/Handbook/AQF_Handbook_07.pdf

Skill Sets in this Training Package

This section provides information on Skill Sets within this Training Package, with the following important disclaimer: Readers should ensure that they have also read the part of the Training Package that outlines licensing and regulatory requirements.

Where this section is blank, nationally recognised Skill Sets have yet to be identified in this industry.

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*.

Skill	Facets
Communication that contributes to productive	Aspects of the skill that employers identify as important. The nature and application of these facets will vary depending on industry and job type. • listening and understanding • speaking clearly and directly
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

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 2007 requirements; licensing/registration requirements; and assessment pathways.

Benchmarks for Assessment

Assessment within the National Skills Framework is the process of collecting evidence and making judgments 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.

In the areas of work covered by this Training Package, the endorsed units of competency 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 PMC 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.

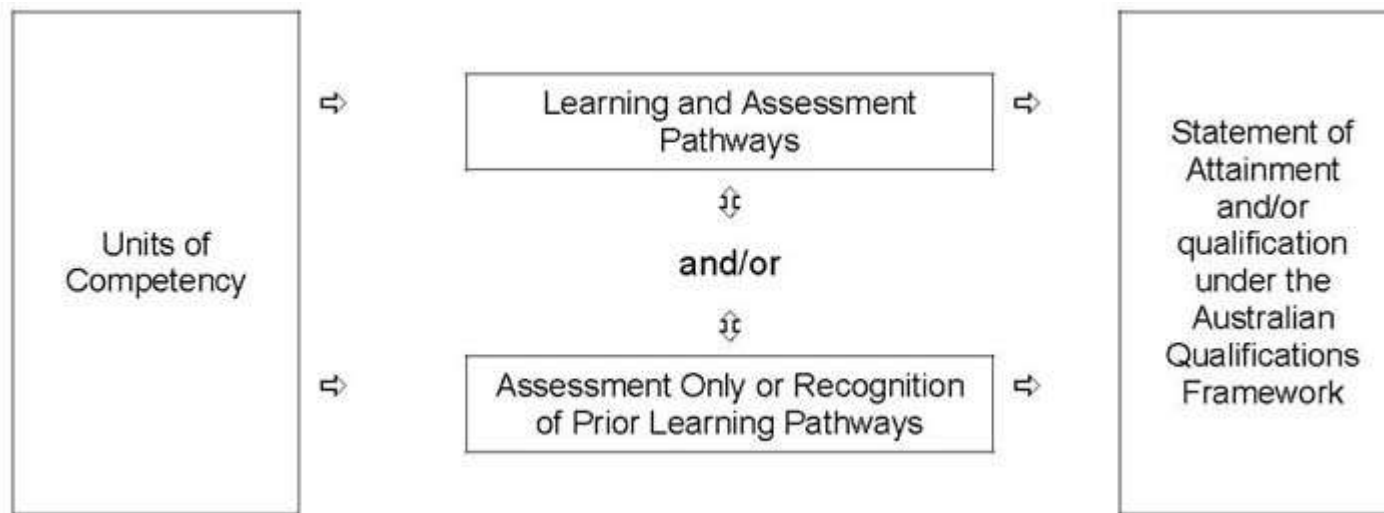
Where delivery and assessment relates to units which may have a licensing requirement the RTO may also need to satisfy the requirements of the local licensing authority.

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		<i>Training and assessment is delivered by trainers and assessors who:</i>
	a)	<i>have the necessary training and assessment competencies as determined by the National Quality Council or its successors</i>
	b)	<i>have the relevant vocational competencies at least to the level being delivered or</i>
		<i>assessed</i>
	c)	<i>continue developing their vocational and training and assessment competencies to support continuous improvements in the delivery of the RTO's services.</i>

Assessment in the manufactured mineral products industry

General issues

Assessment of competency will be in accordance with the relevant legislation applying in each

State and Territory. This will include:

- occupational health and safety acts and regulations
- environmental protection acts and regulations.

In certain circumstances other legislation/regulations will also be relevant including:

- dangerous goods regulations
- relevant discrimination and EEO legislation and regulations.

Wherever possible integrated assessment, which reflects the grouping of competencies as they would be demonstrated in an actual work role, is the preferred means of assessment. The context of the assessment is defined in each unit of competency.

Where units of competency have been imported from another Training Package (ie, the unit code does NOT have the 'PMC' prefix), the RTO responsible for the assessment should check the assessment guidelines covering those units of competency in their source Training Package.

OHS considerations for assessment

The assessor has a legal duty under both legislation and common law duty of care to ensure that the assessment activities do not pose a risk to either the candidate or others (such as other workers or the community) who may be in the learning and assessment environment or affected by the learning or assessment activities.

The designer of assessment strategies should ensure that:

- hazards associated with the assessment environment and standard industry risk controls are identified in line with legislative requirements, industry guidelines and in consultation with the workplace partners

- assessment tools are checked and trialled to ensure that they address OHS

requirements to both the candidate and others who may be impacted

- assessment strategies clearly identify OHS requirements and actions required by the workplace, the assessor, and the candidate.

The assessor should ensure that:

- hazards in the individual assessment environment are identified, in consultation with the workplace, prior to commencement of any assessment activities

- risks to candidates and others that may be associated with the assessment are assessed taking account of the effectiveness of existing risk control measures

- risk control measures are developed and implemented prior to the assessment in consultation with the employer and the candidate

- effectiveness of risk controls are monitored throughout the assessment and any risks addressed.

Equity and reasonable adjustment

The manufactured mineral products industry employs people from a range of social, cultural/language and ethnic backgrounds. It may also employ people with disabilities of various kinds. Evidence gathering methods must be equitable to all groups of participants. Assessment procedures should also be culturally appropriate for the individual and the situation. Reasonable adjustments should be made to assessment procedures for people with special needs such as people with disabilities or with language or literacy difficulties. The language and literacy requirements of the assessment process should not exceed the language and literacy requirements of the particular level of work in the industry.

Reasonable adjustment, sometimes called reasonable accommodation or allowable adjustment, is designed to ensure that all people are treated equally in the assessment process. This means that, wherever possible, 'reasonable adjustments are made to the assessment process to meet individual needs of candidates? KSAT, 2001, ANTA, p147.

Also?

Appropriately structure assessment - it must be stressed that it is the structure of the assessment that is being altered, not the outcomes. Appropriate changes might include breaking the assessment into smaller, more manageable segments and allowing more time to complete an assessment task. It may mean altering the assessment task; for example, not including multiple choice assessments with certain learning difficulties.

Assessors should consider this advice when assessing groups for whom adjustments may need to be made, including :

- *indigenous candidates*
- *non-English speaking background candidates - this includes some indigenous groups*
- *candidates with low literacy and numeracy*

- *older candidates*
- *women*
- *candidates from rural/remote areas*
- *candidates with a disability*
- *candidates with low levels of education*
- *recent returnees to the workforce.*

KSAT, 2001, ANTA, p148-9.

Assessment considerations for 'OPS' units

All units have been written with a focus on a workplace assessment environment. Where this is obligatory it is identified in the 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. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

The performance of 'OPS' units relies on compliance with all the requirements of the organisation's quality management system. Where such systems are mandated by legislation or licensing then the context in which the competence is demonstrated/assessed must meet the requirements of that legislation or licence to the satisfaction of the regulatory authority.

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.

Assessment design considerations

Most units of competency in the PMC04 Training Package, particularly the 'OPS' units, have three main components:

- a set of essential knowledge which is required for the competent performance of the skills which comprise the unit of competency and which is listed in the unit of competency both as part of the performance criteria and also in the evidence guide
- a set of routine skills which will be typically performed on a regular basis on the job and which are the basis of the elements and performance criteria

- a set of non-routine skills which are vital to the safe and efficient operation of the plant/process over the medium to long term and which are included in the elements and performance criteria but which may not be performed on a regular basis.

The assessment design needs to incorporate features which will ensure adequate evidence is gathered for each of these components.

Essential knowledge

It will be difficult, and often impossible, to gather sufficient evidence of the required essential knowledge by means of direct observation alone. It will be necessary to include some form of questioning, which may, or may not, be concurrent with direct observation. Questioning should not rely on written communication to any greater degree than is otherwise required by the unit of competency. The use of diagrams and sketching as well as 'show and tell' should be allowable within the assessment of essential knowledge.

Routine skills

Sufficient evidence of competent performance of routine skills may be obtained by direct observation. However, observation on more than one occasion is required as the observation needs to include performance of the skills under a range of all normal and some abnormal conditions. Thus other evidence gathering tools may be included to gather evidence of consistent performance under a range of conditions. The emphasis is on evidence of competent performance rather than on direct observation, and this may come from plant records and work colleagues.

Non-routine skills

By their nature the non-routine skills are unlikely to be able to be assessed adequately by direct observation. These skills include problem solving and emergency response and it would be inappropriate to set up a situation, or to wait for a situation to occur, which would allow for direct observation. Some appropriate form of simulation/role play/case study is most likely to be the best form of gathering sufficient, appropriate evidence of competence. Where the appropriate choice between these is restricted, this will be stated in the unit of competency. These approaches as defined as:

simulation- a structured resource-based exercise which seeks to simulate real life situations and requires the assessee to achieve a specific task

- **role-play-** a person-centred simulation used to present assessees with the opportunity to display behavioural and interpersonal skills
- **case study-** an assessment tool which presents a simulated context and provides assessees with opportunities to display problem solving and decision making skills.

Generally, where:

- physical skills are significant (eg, emergency procedures), then a simulation is the preferred method (this may require coordination with a regular 'safety drill')
- interpersonal skills are significant, then role-play is the preferred method
- cognitive skills are significant (eg, problem solving), then case study is the preferred method.

Integrated assessment

Notwithstanding the above, it is the intention that the ability to perform the unit of competency as a whole be the key criterion in any assessment process.

Further, it is frequently appropriate to assess more than one unit of competency at the same time, either because the items of equipment combine to make a whole plant unit, or because certain competencies are only practised in combination with other competencies (eg, working in a team with an appropriate 'OPS' unit). The assessment of more than one unit of competency concurrently is desirable, provided adequate evidence is gathered for each competency involved.

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 judgements 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 TAA04 Training and Assessment Training Package and the unit of competency TAAASS403A 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

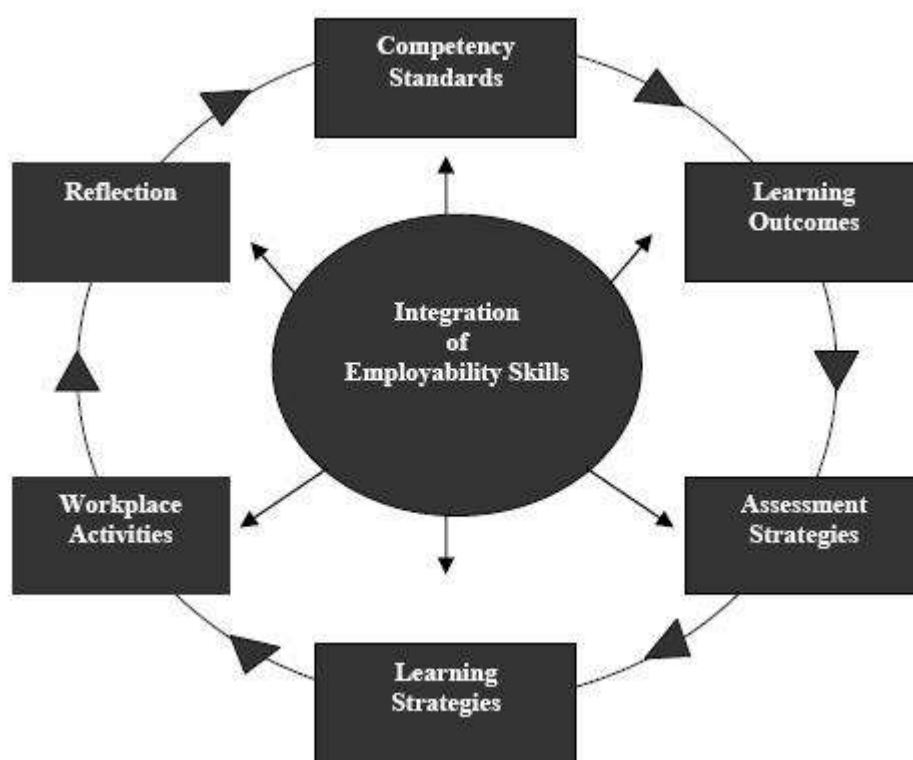
Assessments must meet the criteria set out in the AQTF 2007 Essential Standards for Registration.

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 Manufactured Mineral Products 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.

Assessment resources required

Generally access will be required to an operating plant, complete with the normal interactions between plant items and units to allow for the collection of adequate, valid evidence.

Appropriate adjustments made for assessment need to ensure that such adjustments are valid for an operating plant.

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 8, 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	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	Assemble, fabricate and place reinforcement (planning, technology and organising)
Unit Descriptor	This unit of competency covers the interpretation of plans (steel drawings), the fabrication of reinforcement from pre-cut and bent steel and placement of reinforcing steel cages and assemblies for manufactured concrete products. (organising, problem solving, technology)
Element	Prepare for fabrication (planning and organising) Rectify routine problems

	(initiative and enterprise, problem solving)
Performance Criteria	Check quantities, type, size and shape of reinforcement supplied against drawings, tags and schedules (planning, organising, self management) Identify and rectify equipment failure causes in accordance with procedures/work instructions (initiative, self management, problem solving, communication)

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.

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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

	Identify non-routine problems and report to designated person (initiative, communication, team work)
Range Statement	Where there is an apparent conflict between performance criteria and OHS requirements, the OHS requirements take precedence (learning, self management, initiative)
Required Skills and Knowledge	Skills include implementing enterprise standard procedures and work instructions and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the fabrication of reinforcement. (self management, communication, problem solving, technology)
Evidence Guide	It is essential that the reinforcement fabrication and placement process be understood and that the importance of critical material properties and specifications is known. (technology, learning, problem solving, self management)

Competency Standards - Industry Contextualisation**Contextualisation guidelines for units in this Training Package**

Contextualisation of units of competency is allowed and encouraged, provided the contextualised unit is of a similar level and rigour to the original unit. This can be achieved by:

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

Note that contextualising cannot be used to generate an additional unit which is closely related to an existing unit. Contextualisation may be used to place enterprise specific information in the unit of competency, but not if this results in the use of two similar units in the one qualification.

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 range of variables and the evidence guide.

Note also that contextualisation of 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 and the enterprise
- not reduce the health, safety or environmental requirements
- retain the original code number.

Contextualising 'operations' units

Operations units may be contextualised within the bounds specified above, but are not to be substituted with other units.

The following two operations units are intended to be used primarily in a contextualised form:

- MSAPMOPS200A Operate a unit of equipment
- PMC553000C Set up and tune a process.

These two units apply to situations where no other operational unit in the Training Package is deemed to be appropriate. Both units should be contextualised to suit individual situations, within the general contextualising rules of this section. 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 qualification purposes.

Importing competencies from other Training Packages

This Training Package contains a number of units of competency which have been imported from another Training Package (any unit whose code does not commence with PMC has been imported). These units of competency are treated as if they were PMC units from the point of view of the PMC qualifications and are included within the scope of registration for RTOs whose scope covers this Training Package.

Additional competency units may be **imported** from other endorsed Training Packages and accredited courses to customise a **qualification**. The number and type of units able to be imported to a qualification is identified in the packaging rules. Note that any prerequisites and co-requisites specified must also be imported and included in the total number required.

Exporting competencies 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 is retained
- they are only contextualised to the extent permitted as above
- any specified prerequisites and co-requisites are observed
- Manufacturing Skills Australia is advised to facilitate ongoing communication in the event of an update.

Appendices

Appendices

Appendix 1: Impact of changes to PMC

Appendix 2: PMC10 project management and consultation

Appendix 1 - Impact of changes to PMC

Summary of changes – units and qualifications

The Manufactured Mineral Products Training Package has been fully reviewed and updated. When the project commenced, it had been agreed that the revised units and qualifications would be placed in the Manufacturing Training Package (MSA07), in line with MSA's rationalisation policy. However, as it became evident that *training.gov.au*, which was to replace the NTIS, would not be functioning for at least another 18 months, it was decided the Manufactured Mineral Products Training Package should remain as a separate package.

Existing units of competency and qualifications have been revised as follows:

- all units have been revised with updated underpinning knowledge and Evidence Guides
- existing qualifications have been revised to improve flexibility and encourage further uptake of this Training Package
- the packaging rules comply with the new flexibility requirements that took effect from 1 January 2010.

New Vocational Graduate Certificate in Refractories Engineering

Ten (10) new units of competency have been developed to address industry needs in refractories engineering for the Vocational Graduate Certificate. This qualification was developed in response to a current lack of training and qualifications at this level for this sub-sector and a looming critical industry shortage of refractories engineers. While bachelor level courses do deal with refractories, the specific skills required by the refractories engineer are not adequately covered. Refractories are critical for all high temperature processes and a properly specified and installed refractory significantly increases the thermal efficiency of the process (so reducing the production of greenhouse gases), increases the life of the refractory lined plant and makes the process possible in the first place.

Without refractories we would not have car engines, high octane fuel for cars, steel products, glass or cement, to name some significant products. This qualification provides the pathway to

develop and recognise the required knowledge and skills. There is no existing qualification in this area. The Vocational Graduate Certificate in Refractories Engineering was developed with input from and is supported by the Institute of Refractories Engineers (Australia).

Addition of mandatory sustainability units

In line with the MSA Board's agreed policy that sustainability units are to be included in the mandatory and elective banks of all qualifications, the three MSA sustainability units have been incorporated into the Manufactured Mineral Products qualifications.

This has replaced some of the existing environment units within PMC04. These updated units should lead to an equivalent outcome in the qualification. The impact on delivery and funding should be minimal.

Revised Training Package code and unit codes

As the review of a Training Package automatically results in coding changes, MSA made the decision to take the opportunity to change the Manufactured Mineral Products Training Package unit codes to the current format. As part of MSA's rationalisation process, the units of competency are coded in line with a common coding format that is to be adopted across all future manufacturing units of competency as the qualifications and units are reviewed.

MSA has agreed to use numeric industry field identifiers for all units of competency. This provides a more data-friendly model of coding and one that is based on a logical arrangement. We had previously used alpha characters for industry field identifiers in some of our units/Training Packages but found that there were considerable conflicts arising within our own taxonomy. Given the range of fields in manufacturing sectors, with the potential to use identical alpha characters and the meaningless association with some possible alpha combinations, we determined that a purely numerical system provides a more logical solution for coding of manufacturing units.

The table below indicates the industry field codes for PMC10:

PMC04	PMC10	Sector/competency field
OPS	55	Operations/technical
SUP	56	Support

For example

PMCOPS350B	PMC553050C Produce architectural precast concrete
PMCSUP283B	PMC562083C Allocate and complete team tasks

The first number after the field code indicates the AQF level. Note that an additional '0' has been added to the sequence code to accommodate the possibility of more than 99 units in that sequence.

Industry priorities and expectations

Industry representatives and RTOs see this latest version of the Manufactured Mineral Products Training Package as maintaining the currency of the existing qualifications with updated units of competency.

The refractories sub-sector considers that the expanded coverage into the Vocational Graduate Certificate as being a timely and significant addition allowing for the improvement and recognition of knowledge and skills.

New units of competence for the new Vocational Graduate Certificate in Refractories Engineering have been developed in response to previously identified industry needs. The new units will address gaps in coverage for this sub-sector at this level. The Vocational Graduate Certificate is a new qualification, there being no existing qualification for this sub-sector.

The number of imported units has increased as more units have been sourced from other MSA Training Packages. This is consistent with the MSA rationalisation process and also makes better use of resources in thin markets. It is also a reflection of the ubiquitous nature of process control technology and government regulation and a common industry attitude and culture across vast portions of the process manufacturing sector.

Impact of newly endorsed components

No changes have been made to the previous version of the units or qualifications that will cause significant impacts to RTOs. As a full review of a Training Package results in coding changes, there is minimal impact from the revised coding format.

While all existing units have been revised to improve their currency and reflect feedback from users, the bulk of revised units have equivalent outcomes to the units in the previous version of the Training Package. As part of the update, all prerequisite requirements were rigorously reviewed with many being withdrawn. This has resulted in many units being deemed not equivalent, however, in most cases the technical outcome of the individual units has not been altered. This information is including in the Training Package documentation.

The packaging rules for all qualifications have been revised and the format for the packaging rules changed to improve clarity in line with MSA policy. The Diploma has been made a direct entry qualification and no longer requires competence in units from lower level qualifications. This may mean that for people entering the Diploma from outside the industry that greater time will need to be allowed for the development of competency at this level.

Other than the addition of a sustainability unit in the mandatory groups for existing qualifications, the revised qualifications are considered equivalent in technical content.

Specialisations have not been listed for any of the qualifications (other than the Vocational Graduate Certificate). However the practice of coding units of competency relevant to the various sub-sectors with adjacent codes means that sub-sector specialties are reasonably apparent within the qualification tables. As before, other units may also be applicable which is why they are not restricted to that specialisation.

Implementation of PMC10 is expected in all States and Territories. RTOs throughout Australia have delivered previous versions of the Manufactured Mineral Products Training Package (PMC99 and PMC04) for almost a decade. These RTOs will now be able to take advantage of the updated units and qualifications. The inclusion of selected Competitive Manufacturing (Lean) units will also allow these RTOs to assist their client organisations to move towards best practice manufacturing while still delivering the fundamental technical skills.

Delivery of the new Vocational Graduate Certificate does not require access to expensive equipment. However, it will require partnering with an industry partner to allow for the development and assessment of the competency. This qualification would be well suited for delivery by an industry body under auspice from a suitable RTO who was able to provide delivery and assessment expertise.

State and Territory Training Authorities, RTOs and industry stakeholders have been consulted during the development process and have been kept informed of the changes. MSA is not aware of any issues that need addressing to ensure successful implementation. It is expected RTOs with scope of existing PMC04 qualifications will be seek automatic extension of scope for the revised qualifications.

Appendix 2 – PMC10 project background and consultation

Industry drivers for change

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

- Some sectors are energy intensive and will be impacted by any Carbon Pollution

Reduction Scheme/Emissions Trading Scheme (eg cement/lime, glass and heavy clay). This was subject to further consultation as part of this project. The outcome of this specific investigation showed that the existing units were sufficiently forward looking to cover the expected skills needs for these sectors. This may change when an actual CPRS/ETS or other revised scheme is actually introduced.

- There has been significant technological change in the field of process control. This issue had also confronted the review of the PMA Training Package which led to PMA08 Chemicals, Hydrocarbon and Refining Training Package. As the process control systems and issues are similar, the revised PMA08 process control units were proposed to a PMC expert group who concluded they were appropriate for inclusion within PMC10.
- As the workforce matures and senior personnel retire, there is a growing need for the high level skills which are specific to this sector. While these skills may be touched on by typical degree courses they do not cover the specifics of this sector in sufficient detail. There was specific consultation with the sub-sectors of cement, concrete and refractories. While all agreed that there was a skills need, only refractories saw it as a current priority and so this led to a Vocational Graduate Certificate in Refractories Engineering being developed. The cement and concrete sub-sectors should be revisited in twelve months in this regard.

Project management

The project was overseen by an MSA Board Sub-Committee made up of major stakeholders. The terms of reference were to:

- assist in the identification of stakeholders to be consulted for the project
- identify and assist in the resolution of industry issues in relation to strategic objectives of MSA's projects
- provide industry input and advice on:
 - industrial issues
 - training and assessment issues
 - priority areas for industry skills development
 - appropriate methods for collection, collation and consolidation of industry information
 - validity of the content of project outcomes
- provide feedback on MSA's development work undertaken for the area covered
- exchange information as appropriate between MSA, industry and other relevant professional groups covered
- provide feedback on the project development work for the area of interest
- make recommendations to the MSA Board on acceptance of the product of the project..

The individuals and enterprises/organisations represented on the MSA Board Sub-Committee

are set out in the following table:

Name	Enterprise/organisation
David Graham (Chair) ,	Huntsman Chemicals
Kerryn Caulfield	Composites Australia
Richard Lindner	Manufacturing Skills Queensland
Alex Stanojevic	Ai Group
Heather Yerbury	Boral Concrete Products
Ian Booth	Australasian Corrosion Association
Sam Wood	AWU

Consultation and validation processes

Consultations during the development and validation process were undertaken with:
 technical experts from the relevant sub-sector or specialty area of expertise
 representatives of RTOs who already offer current qualifications and/or are intending to offer the qualification.

Consultation was largely by use of nominal groups, face-to-face and email with expert input sought and obtained for the specific needs of the project.

Drafts of all units of competence and qualifications were then posted on the MSA website for validation and stakeholders were advised by email about how to access the site and provide feedback. This included industry stakeholders listed on the MSA database, State industry advisory bodies, and State Training Authorities.

This feedback was used to further refine the units and qualifications. In some cases, the feedback received and the units involved were reviewed again by technical experts prior to final editing.

The following individuals and organisations participated in the development process. The great value of their expertise and input is gratefully acknowledged.

First	Second Name	Organisation	State

Name			
Dan	Perera	Australian Ceramic Society	NSW
Judith	Bowler	Australian Institute of Workplace Learning	NSW
Henry	Newman	Blue Circle Southern Cement Ltd	NSW
Robert	Strode	Blue Circle Southern Cement Ltd	NSW
Peter	Hannah	Boral	NSW
Phil	Renwick	Boral	NSW
Ron	Pike	Boral Australian Construction Materials Ltd	NSW
Bob	Lenstra	Boral Besser Masonry	NSW
Allan	Bounader	Boral Bricks (NSW) P/L	NSW
Barry	Lee	Boral Bricks (NSW) P/L	NSW
Jennifer	Pike	Boral Bricks (NSW) P/L	NSW
Gary	Richards	Boral Bricks (NSW) P/L	NSW
Frank	Ryan	Boral Bricks (NSW) P/L	NSW
Amanda	Tober	Boral Building Products	NSW
Tony	Cross	Boral C. M. Quarries	NSW
John	Malempre	Boral C. M. Quarries	NSW
Andrew	Mercer	Boral C. M. Quarries	NSW
John	Davey	Boral Clay and Concrete	NSW
Bob	Bornstein	Boral Concrete	NSW
Don	Eagleson	Boral Concrete	NSW
Peter	Casey	Boral Construction Materials	NSW
Ion	Dumitru	Boral Construction Materials	NSW
Jean	Hill	Boral Construction Materials	NSW
Phil	Ranwick	Boral Construction Materials	NSW

John	Shaw	Boral Construction Materials	NSW
Gabrielle	Deschamps	Boral Constructions Materials	NSW
Bill	Blenkey	Boral Country Concrete & Quarries	NSW
Elaine	Bardill	Boral Montoro P/L	NSW
Frank	Matijevic	Boral Plasterboard	NSW
Eric	Angus	Boral Roofing	NSW
Len	Place	Boral Roofing	NSW
Allan	Kelly	Bulli Refractories P/L	NSW
Greg	Connor	C.I. Ceramics (Aust) Pty Ltd	NSW
Kurt	Read	C.I. Ceramics (Aust) Pty Ltd	NSW
Sue	Morgan	Caloola Skills Training & Job Placements	NSW
Sue	Randall	Caloola Skills Training & Job Placements	NSW
Michael	Baker	Caroma	NSW
Andrew	Gates	Cement Australia Holdings P/L	NSW
Paul	Kidd	Cement Australia Holdings P/L	NSW
Paul	Wilson	Cement Australia Holdings P/L	NSW
Alister	Kentish	CEPU - Electrical Division	NSW
Jeff	Brand	Clay Brick & Paver Inst	NSW
Matt	Murphy	Communications, Electrical, Plumbing Union	NSW
RK	Sun	Concrete Technology Laboratories MBT (Australia) Pty Ltd	NSW
Argy	Beletich	Construction & Transport ESD	NSW
Michael	Fox	CSR Fibre Cement	NSW
Kevin	Crosato	CSR Humes	NSW
Enzo	Bova	George Fisher	NSW

Bruno	Meier	George Fisher	NSW
Roland	Seger	George Fisher	NSW
Dennis	Jones	George Fisher IPS Pty Ltd	NSW
John	Hewitt	Hanson Precast Pty Ltd	NSW
Brett	Lewer	Hanson Precast-Riverstone	NSW
Peter	Simpson	James Hardie Building Boards P/L	NSW
Tim	Ferrari	Liquor Hospitality and Miscellaneous Union	NSW
Keith	Godfrey	Maldon Works	NSW
Celeste	Howden	Manufacturing Learning Australia	NSW
John	Maraz	Manufacturing Skills Australia (MSA)	NSW
J	Smith	Master Glass Industries	NSW
Michael	McLeay	MD & Associates Pty Ltd	NSW
Bob	Gill	O-I ACI Operations Pty Ltd	NSW
Doug	DeCean	O-I Australia	NSW
Mark	Finney	PGH Bricks & Pavers	NSW
R	Van Der Nouwellant	Viridian	NSW
Les	Chegwidden	Viridian	NSW
Vince	Pacetta	Profile Plaster and Metal	NSW
Hayley	Wegner	Readymix	NSW
M	Lipo	Rescrete	NSW
D	Mamefield	Rescrete	NSW
Serge	Arciuli	Rescrete Industries	NSW
John	Burke	Rescrete Industries	NSW
Marc	Mearing	Rocla Pavers & Masonry	NSW

Glen	Whiteford	Rocla Pavers & Masonry	NSW
Peter	Stephens	Rocla Pipeline Products	NSW
Stephen	Wolstenholme	Rocla Pipeline Products	NSW
Ross	Howie	Shinagawa Thermal Ceramics	NSW
Michael	Pauline	Shinagawa Thermal Ceramics	NSW
James	Tyler	Shinagawa Thermal Ceramics	NSW
Wolf	Merretz	Structural Concrete Industries	NSW
Godfrey	Smith	Structural Concrete Industries	NSW
Kim	Peterson	TAFE NSW	NSW
Elizabeth	Hellenpach	TAFE Western Sydney Institute	NSW
Nino	Azzopardi	Tuscan Industries P/L	NSW
Kevin	Bailey	Tuscan Industries P/L	NSW
Ron	Mckew		NSW
Mark	Leahy	Accrete P/L	NT
Mark		Boral	NT
Helder	Santos	Hanson	NT
Mike	Cull	HB Concrete	NT
Costa	Simeon	HB Concrete	NT
Norm		Kwik Con	NT
Archie	Wright	Major Industries Training Advisory Council Ltd	NT
Roy	Webb	Readymix	NT
Barry	Cramond	TEATAC (NT) Inc	NT
Jennifer		Tennant Creek Concrete Supplies	NT
Dennis		U-Cart	NT
Heather	McLeish	Golden Bay Cement	NZ

Neville	Kussrow	O-I	Qld
Andrew	Blunden	O-I	Qld
Alan	Bartlett	Alan Bartlett Consulting Pty Ltd	Qld
Kevin	Williams	Australian 4WD Driver Training & Tours	Qld
Tim	De Groot	Baseline Training & Consulting	Qld
Heather	Yerbury	Boral Concrete Products	Qld
Tony	Randerson	Boral Masonry	Qld
Brian	Beetson	Boral Resources	Qld
Sean	Cummiskey	Cement Australia Pty Ltd	Qld
Morris	Maker	Central Qld Institute of TAFE, Canning Street campus	Qld
Dan	Brassington	Childers Concrete & Haulage	Qld
Gary	Gillespie	CSR Humes	Qld
Dennis	McMillan	Everhard Industries P/L	Qld
Bob	Farley	James Hardie Building Boards P/L	Qld
Mal	McKenna	James Hardie Building Boards P/L	Qld
Julie	Keddie	Manufacturing Skills Australia (MSA)	Qld
Eric	Salonen	Manufacturing Skills Queensland, QMI Solutions	Qld
Hans	Oppermann	Mount Isa Brickworks	Qld
Alan	Matthewman	National Glass P/L	Qld
Terry	Ohora	OI Asia Pacific	Qld
Robert	McTackett	Pioneer Building Products	Qld
Ian	Coulter	Precast Concrete P/L	Qld
Iain	Tait	QLD Cement Ltd	Qld
Brian	Tobin	Readymix Beenleigh Quarry	Qld

Paul	Riggieri	RGR Concrete Brickworks	Qld
David	Jones	Sunstate Cement	Qld
Mark	Tonkin	Sunstate Cement	Qld
Peter	Watters	Sunstate Cement	Qld
Ian	Simeon	Unity Glass Pty Ltd	Qld
Jenny	Chapman	Axxton Pavers	SA
Bill	D'Ottavi	Best Masonry Bricks & Pavers	SA
Leo	Floreani	Constress P/L	SA
Elizabeth	Owers	DFEEST	SA
Bob	Sellars	Hallett Brick Industries (SA)	SA
Brendan	Brown	Humes	SA
Michael	Walton	Institute of Refractories Engineers	SA
Derek	Cupp	Manufacturing Industry Skills Advisory Council SA Inc	SA
Leo	Andolfatto	Marble and Cement Works	SA
Nicola	Powell	OI Asia Pacific	SA
Michael	Broadbent	OneSteel	SA
Graeme	Biffin	Boral Resources	Tas
Phil	Sidney	Boral Resources	Tas
Geoff	Speers	Cradle Coast Authority	Tas
Nick	Makin	Learning Partners	Tas
Deb	Doherty	Skills Tasmania	Tas
Harry	Lumanski	O-I	Vic
Michael	Wilhelm	O-I	Vic
Pauline	Saliba	O-I	Vic

R	Attwater	Auscore Concrete P/L	Vic
Sam	Wood	Australian Workers Union	Vic
Graeme	Rae	Australian Workers' Union	Vic
Michael	Troeth	Blue Circle Cement	Vic
Ian	Campbell	Blue Circle Southern Cement	Vic
Brian	Lassey	Blue Circle Southern Cement	Vic
David	Seymour	Blue Circle Southern Cement	Vic
Trevor	Somerville	Blue Circle Southern Cement	Vic
Paul	Benstead	Blue Circle Southern Cement Ltd	Vic
James	Collings	Blue Circle Southern Cement Ltd	Vic
Brian	McGrath	Blue Circle Southern Cement Ltd	Vic
Andrew	Patterson	Boral	Vic
Mark	Sammut	Boral Plasterboard	Vic
Gale	Lewis	Brookweed Holdings P/L	Vic
Michael	Darrough	Caroma Industries Ltd	Vic
Neil	Dow	Caroma Industries Ltd	Vic
Michael	O'Connor	CFMEU FFPD	Vic
Trevor	Lange	Chisholm Institute	Vic
Ken	Cusick	Civil Construction Corporation	Vic
Sarah	Andrews	Construction Materials Association	Vic
Tom	Kovacs	CSR Readymix	Vic
Trevor	Dixon	Eureka Tiles	Vic
Ian	Montague	Eureka Tiles	Vic
Preet	Kaur	Futurum Australia	Vic
Ann	Fisk	Geelong Cement	Vic

Greg	Jacka	Geelong Cement	Vic
Jeff	Tucker	Geelong Cement	Vic
Josh	Giroto	Giroto Precast P/L	Vic
Lewis	Davis	Glass Supplies Pty Ltd	Vic
Craig	Anderson	Goliath Portland Cement	Vic
Chris	Dempsey	Goliath Portland Cement	Vic
Peter	Healy	Hollow Core Concrete P/L	Vic
Tony	Goldsworthy	Holmsglen TAFE	Vic
Alan	Dowe	Independent Cement & Lime	Vic
John	Holt	Independent Cement & Lime	Vic
Alex	Bernhardt	Manufacturing and Engineering Skills Advisory Body	Vic
Paul	Kennett	Manufacturing and Engineering Skills Advisory Body	Vic
Nick	Koerbin	Materials Australia	Vic
Kerry	Irving	Mentor HR Training & Development	Vic
Kerry	Irving	Mentor Training	Vic
David	Piper	Midland Concrete Pipes	Vic
Alex	Bernhardt	MSV	Vic
Russ	Porter	Northcote Pottery	Vic
Tina	Berghella	Oggi Consulting	Vic
Ian	Wilson	OI Asia Pacific - ACI Operations Pty Ltd	Vic
John	Wheeler	O-I Melbourne	Vic
Lydia	Kendray	OzeTraining Pty Ltd	Vic
Leigh	Twining	Viridian	Vic
Michael	Wilhelm	Viridian	Vic

Chris	Barker	Viridian	Vic
Noel	Stokes	Viridian	Vic
Jillian	Read	Viridian	Vic
Frank	Hutchinson	Pioneer Building Products	Vic
Moya	Powe	Professional Training Services Australia Pty Limited	Vic
Delia	Avram	Pyrotek	Vic
Brendt	Halliday	Pyrotek	Vic
Bruno	Doring	RMIT University Info Corner	Vic
Peter	Anderson	Rocla Pipeline Products	Vic
John	McCabe-Doyle	Roofing Tile Association of Victoria	Vic
Felix	Fraraccio	Steven Glass (Croydon) Pty Ltd	Vic
Ray	Cadmore	Sunraysia Institute of TAFE	Vic
Justin	Leech	Sunraysia Institute of TAFE	Vic
Wendy	Jackson-Brooks	University of Ballarat	Vic
Leigh	Otten	VECCI	Vic
Kerry	Benson	Veridan Glass	Vic
Kerrie	Benson	Viridian	Vic
Brad	Gething	Viridian	Vic
Dean	Dinale	Westkon Precast Concrete	Vic
John	Molenaar		Vic
David	Scott	BGC Cement	WA
Garry	James	Boral Concrete	WA
Peter	McDiarmid	Boral Resources	WA
Lindsay	Travers	Cockburn Cement	WA

Harry	Barcus	Concrete, Cement and Aggregate Association	WA
Mark	Murray	CSR Humes	WA
Gino	Peralla	Delta Corporation Ltd	WA
Jason	Walsh	Delta Corporation Ltd	WA
David	Nissen	Engineering and Automotive Training Council Inc	WA
Robyn	Ivankovich	Georgiou Group Pty Ltd	WA
Geoffrey	Mowatt	Mowatt Refractories Pty	WA
Paradip	Roy	Mowatt Refractories Pty	WA
Jim	Maguire	Process Manufacturing ITC of WA Inc	WA
		Swan TAFE	WA
Margaret	Jack	WA Department of Education & Training	WA
Michelle	Brady	Western Australian Department of Education and Training	WA
Beryl	Caldis	Western Australian Department of Education and Training	WA

Clear and full support for endorsement of the revised Training Package has been provided by all industry and RTO stakeholders.

PMC20110 Certificate II in Manufactured Mineral Products

Modification History

Not applicable.

Description

This qualification covers the skills and knowledge required to perform a range of process operations within the manufactured mineral products industries.

Job roles/employment outcomes

The Certificate II in Manufactured Mineral Products 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.

Application

This qualification is typically used to prepare new employees or develop existing workers performing an operational role in the production of manufactured mineral products.

Operators may specialise in one of the following sectors:

- cement
- precast concrete products
- premixed concrete
- clay products
- ceramic products
- float (flat) glass
- glass containers
- refractories
- plaster (both fibrous plaster and plaster boards)
- fibre cement boards and other products
- ground minerals
- abrasive grinding wheels and cutting discs
- 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 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 PMC30110 Certificate III in Manufactured Mineral Products, 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 considerations

There are no specific licences that relate to this qualification. However, some units 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	• maintain communication about work related subjects and with appropriate audiences • complete required workplace forms reports • use technical information and workplace procedures • collect and organise information • communicate ideas and information • use workplace documentation • maintain workplace records
Teamwork	• identify and describe own role and role of others • work within a team • teamwork strategies
Problem solving	• recognise a problem or a potential problem • determine problems needing priority action • refer problems outside area of responsibility to appropriate person • identify appropriate theory base for problem • solve problems within area of responsibility • follow through items initiated until final resolution has occurred • identify and isolate faults in equipment • use simple formal problem solving techniques
Initiative and enterprise	• identify the required process conditions for equipment • determine problems needing action • suggest required action • report problems outside area of responsibility • distinguish between causes of faults
Planning and organising	• prioritise actions to achieve required outcomes

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY	
	• plan own work requirements • plan and organise activities • identify tasks to achieve team goals • monitor completion of allocated tasks
Self-management	• plan own work requirements from job requests • operate within appropriate time constraints and work standards • select and use appropriate equipment, materials, processes and procedures • plan to ensure effective production • apply standard procedures • identify resource requirements • recognise limitations and seek timely advice
Learning	• ask questions to clarify information • identify sources of information required for job • participate in improvement procedures • participate in development of continuous improvement strategies
Technology	• operate equipment • start up and shut down equipment • monitor quality • function and operating principles of equipment • maintain workplace records

Packaging Rules

Packaging Rules

To be awarded the Certificate II in Manufactured Mineral Products competency must be achieved in **fifteen (15)** units of competency:

- **six (6)** core units of competency
- **nine (9)** elective units of competency from Groups A and B, as specified below.

Note

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

Core units of competency

Select **six (6)** core units of competency as specified below.

All **five (5)** of these units must be chosen.

Unit code	Title	Prerequisites
MSAENV272A	Participate in environmentally sustainable work practices	
MSAPMOHS200A	Work safely	
MSAPMSUP100A	Apply workplace procedures	
MSAPMSUP101A	Clean workplace or equipment	
MSAPMSUP102A	Communicate in the workplace	

Select **one (1)** of the following units. Note that only MSAPMOPS101A **OR** PMAOPS101C may be included in this qualification, not both.

Unit code	Title	Prerequisites
MSAPMOPS101A	Make measurements	
PMAOPS101C	Read dials and indicators	

Elective units of competency

Group A - Specialist electives

A minimum of **two (2)** specialist elective units must be chosen from the list below.

Unit code	Title	Prerequisites
MSAPMOPS200A	Operate equipment	
MSAPMOPS212A	Use enterprise computers or data systems	
MSAPMSUP230A	Monitor process operations	

Unit code	Title	Prerequisites
PMAOPS216B	Operate local control system	
PMC552002C	Operate equipment to blend/mix materials	
PMC552003C	Operate grinding equipment	
PMC552004C	Prepare for production	
PMC552005C	Process greenware/green products	
PMC552006C	Operate an autoclave	
PMC552007B	Heat accelerate the curing of precast concrete	
PMC552008B	Operate crushing equipment	
PMC552010C	Operate a calcining kiln	
PMC552020C	Operate slip casting equipment	
PMC552021C	Operate manual glazing equipment	
PMC552022C	Prepare materials for clay and ceramic production	
PMC552023C	Finish products after firing	
PMC552024C	Hand mould products	
PMC552030C	Operate a firing kiln	
PMC552031C	Operate extrusion equipment	
PMC552032C	Operate pressing equipment	
PMC552040C	Operate glass melting process	

Unit code	Title	Prerequisites
PMC552041C	Operate process ovens	
PMC552042C	Operate blown insulation equipment	
PMC552043C	Operate float forming equipment	
PMC552044C	Operate fibre forming equipment	
PMC552045C	Operate container forming equipment	
PMC552046C	Operate glass printing equipment	
PMC552047C	Operate primary annealing equipment	
PMC552048C	Operate glass finishing equipment	
PMC552049C	Operate on-line stacking and assembly equipment	
PMC552050C	Schedule, cut and bend reinforcement	
PMC552051C	Finish green concrete products	
PMC552052C	Cast moulded concrete products	
PMC552053C	Finish cured concrete products	
PMC552054C	Spin concrete pipes	
PMC552055C	Conduct benching operations	
PMC552056B	Assemble, fabricate and place reinforcement	

Unit code	Title	Prerequisites
PMC552057B	Finish casting operation	
PMC552058B	Demould concrete products	
PMC552060C	Batch mix concrete	
PMC552061C	Deliver concrete to site	
PMC552065B	Prepare asphalt	
PMC552070B	Operate forming equipment	
PMC552071B	Operate wet and dry end equipment	
PMC552072B	Produce fibrous plasterboard	
PMC552090B	Use and maintain tools and equipment for refractory operations	
PMC552091B	Prepare for, install and repair refractory brickwork/blockwork	
PMC552092B	Prepare for and install mouldable refractory materials	
PMC552093B	Prepare for and cast refractory materials	
PMC552094B	Prepare for and apply shotcrete for installation	
PMC552095B	Prepare for, install and repair ceramic fibre	
	Up to one (1) specialist elective unit may be chosen from Group A of PMC30110 Certificate III in Manufactured Mineral	

Unit code	Title	Prerequisites
	Products.	

Group B - Other electives

The balance of units, to a maximum of **seven (7)**, may be drawn in any combination from:

- units not already chosen from Group A above
- Group B units listed below

Unit code	Title	Prerequisites
MNMC205A	Conduct local risk assessment	
MSACMT230A	Apply cost factors to work practices	
MSACMT231A	Interpret product costs in terms of customer requirements	
MSACMT240A	Apply 5S procedures in a manufacturing environment	
MSACMT250A	Monitor process capability	
MSACMT251A	Apply quality standards	
MSACMT260A	Use planning software systems in manufacturing	
MSACMT270A	Use sustainable energy practices	
MSACMT271A	Use sustainable environmental practices	
MSACMT280A	Undertake root cause analysis	
MSACMT281A	Contribute to the application of a proactive	

Unit code	Title	Prerequisites
	maintenance strategy	
MSAPMOHS110A	Follow emergency response procedures	
MSAPMOPS100A	Use equipment	
MSAPMPER200B	Work in accordance with an issued permit	
MSAPMPER201A	Monitor and control work permits	
MSAPMPER202A	Observe permit work	
MSAPMPER205B	Enter confined space	
MSAPMSUP106A	Work in a team	
MSAPMSUP200A	Achieve work outcomes	
MSAPMSUP201A	Receive or despatch goods	
MSAPMSUP210A	Process and record information	
MSAPMSUP240A	Undertake minor maintenance	
MSAPMSUP280A	Manage conflict at work	
MSAPMSUP292A	Sample and test materials and product	
MSL952001A	Collect routine site samples	
PMAOPS105C	Select and prepare materials	
PMBHAN103C	Shift materials safely by hand	
PMC561072C	Store materials for production	

Unit code	Title	Prerequisites
PMC561080B	Organise self	
PMC562070B	Move materials	
PMC562071C	Operate bulk materials handling equipment	
PMC562075B	Maintain kiln refractory	
PMC562081B	Deliver customer service	
PMC562083C	Allocate and complete team tasks	
TLIC307C	Drive medium rigid vehicle	
TLIC407D	Drive heavy rigid vehicle	
TLID1007C	Operate a forklift	
	Note: Only one of TLIC307C or TLIC407D may be included in this qualification, not both.	
	Up to four (4) relevant units may be selected from this Training Package, other endorsed Training Packages and accredited courses, where those units are available at Certificate II or III.	

PMC30110 Certificate III in Manufactured Mineral Products

Modification History

Not applicable.

Description

This qualification covers the skills and knowledge required to perform a range of advanced operations within the manufactured mineral products industries.

Job roles/employment outcomes

The Certificate III in Manufactured Mineral Products 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 including startup and shutdown 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.

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 manufactured mineral products industries.

Operators may specialise in one of the following areas:

- cement
- precast concrete
- premixed concrete
- clay products
- ceramic products
- float (flat) glass
- glass containers
- refractories
- plaster (both fibrous plaster and plaster boards)
- fibre cement boards
- ground minerals
- abrasive grinding wheels and cutting discs
- other 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 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, PMC20110 Certificate II in Manufactured Mineral Products 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 PMC40110 Certificate IV in Manufactured Mineral Products, 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.

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

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 considerations

There are no specific licences that relate to this qualification. However, 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	• maintain communication about multiple subjects and with multiple audiences • complete incident and other reports • use technical information and manufacturer 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 others • work within a team • resolve conflicts between team members • teamwork strategies
Problem solving	• recognise a problem or a potential problem • determine problems needing priority action • refer problems outside area of responsibility to appropriate person • identify appropriate theory base for problem • seek information and assistance as required to solve problems • solve problems within area of responsibility • follow through items initiated until final resolution has occurred • identify and isolate faults in equipment

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY	
	• use a range of formal problem solving techniques
Initiative and enterprise	• identify the most appropriate process conditions for equipment • 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 • plan own work requirements and assist others to plan theirs • 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 job requests • operate within appropriate time constraints and work standards • select and use appropriate equipment, materials, processes and procedures • plan to ensure effective production • apply standard procedures • identify resource requirements • 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 • assist others develop competency
Technology	• operate and adjust equipment • start up and shut down equipment • set up equipment • monitor quality • function and operating principles of equipment • maintain workplace records

Packaging Rules

Packaging Rules

To be awarded the Certificate III in Manufactured Mineral Products competency must be achieved in **twenty (20)** units of competency:

- **six (6)** core units of competency
- **fourteen (14)** 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

Select **six (6)** core units of competency as specified below.

All **five (5)** of these units must be chosen.

Unit code	Title	Prerequisites
MSAENV272A	Participate in environmentally sustainable work practices	
MSAPMOHS200A	Work safely	
MSAPMSUP100A	Apply workplace procedures	
MSAPMSUP101A	Clean workplace or equipment	
MSAPMSUP102A	Communicate in the workplace	

Select **one (1)** of the following units. Note that only MSAPMOPS101A **OR** PMAOPS101C may be included in this qualification, not both.

Unit code	Title	Prerequisites
MSAPMOPS101A	Make measurements	
PMAOPS101C	Read dials and indicators	

Elective units of competency**Group A - Specialist electives**

A minimum of **one (1)** unit must be selected from the list below.

Unit code	Title	Prerequisites
MSL974005A	Perform physical tests	
PMAOPS305B	Operate process control systems	
PMC553000C	Set up and tune a process	
PMC553010C	Process raw meal into product	PMC552010C
PMC553020C	Prepare moulds and dies	
PMC553021C	Set up and tune glazing equipment	
PMC553040C	Set up and optimise glass forming process	
PMC553041C	Set up and optimise glass furnace process	
PMC553042C	Set up and optimise secondary process	
PMC553050C	Produce architectural precast concrete	
PMC553051B	Produce structural precast concrete	
PMC553070B	Design and construct moulds for fibrous plaster products	PMC552024C
PMC553072B	Model fibrous plaster products	
PMC553080B	Set up and optimise finishing process	
	Up to one (1) specialist	

Unit code	Title	Prerequisites
	elective unit may be chosen from Group A in PMC40110 Certificate IV in Manufactured Mineral Products	

Group B - Other electives

The balance of units, to a maximum of **thirteen (13)**, may be drawn in any combination from:

- units not already chosen from Group A above
- Group B units listed below, with a maximum of **nine (9)** from Group B2

Group B1

Unit code	Title	Prerequisites
MEM09002B	Interpret technical drawing	
MSAPMOHS300A	Facilitate the implementation of OHS for a work group	MSAPMOHS200A
MSAPMPER300B	Issue work permits	MNMC205A
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	MSAPMSUP200A
MSAPMSUP303A	Identify equipment faults	
MSAPMSUP310A	Contribute to development of plant documentation	
MSAPMSUP330A	Develop and adjust a production schedule	
MSAPMSUP382A	Provide coaching/mentoring in the workplace	
MSAPMSUP390A	Use structured problem	

Unit code	Title	Prerequisites
	solving tools	
MSL973001A	Perform basic tests	
PMC563081C	Carry out stock control	
TAAASS301B	Contribute to assessment	
TAADEL301C	Provide training through instruction and demonstration of work skills	
	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 III or IV.	

Group B2

Unit code	Title	Prerequisites
MNMC205A	Conduct local risk assessment	
MSACMT230A	Apply cost factors to work practices	
MSACMT231A	Interpret product costs in terms of customer requirements	
MSACMT240A	Apply 5S procedures in a manufacturing environment	
MSACMT250A	Monitor process capability	
MSACMT251A	Apply quality standards	

Unit code	Title	Prerequisites
MSACMT260A	Use planning software systems in manufacturing	
MSACMT270A	Use sustainable energy practices	
MSACMT271A	Use sustainable environmental practices	
MSACMT280A	Undertake root cause analysis	
MSACMT281A	Contribute to the application of a proactive maintenance strategy	
MSAPMOHS110A	Follow emergency response procedures	
MSAPMOPS100A	Use equipment	
MSAPMOPS200A	Operate equipment	
MSAPMOPS212A	Use enterprise computers or data systems	
MSAPMPER200B	Work in accordance with an issued permit	
MSAPMPER201A	Monitor and control work permits	
MSAPMPER202A	Observe permit work	
MSAPMPER205B	Enter confined space	
MSAPMSUP106A	Work in a team	
MSAPMSUP200A	Achieve work outcomes	
MSAPMSUP201A	Receive or despatch goods	
MSAPMSUP210A	Process and record information	
MSAPMSUP230A	Monitor process	

Unit code	Title	Prerequisites
	operations	
MSAPMSUP240A	Undertake minor maintenance	
MSAPMSUP280A	Manage conflict at work	
MSAPMSUP292A	Sample and test materials and product	
MSL952001A	Collect routine site samples	
PMAOPS105C	Select and prepare materials	
PMAOPS216B	Operate local control system	
PMBHAN103C	Shift materials safely by hand	
PMC552002C	Operate equipment to blend/mix materials	
PMC552003C	Operate grinding equipment	
PMC552004C	Prepare for production	
PMC552005C	Process greenware/green products	
PMC552006C	Operate an autoclave	
PMC552007B	Heat accelerate the curing of precast concrete	
PMC552008B	Operate crushing equipment	
PMC552010C	Operate a calcining kiln	
PMC552020C	Operate slip casting equipment	
PMC552021C	Operate manual glazing	

Unit code	Title	Prerequisites
	equipment	
PMC552022C	Prepare materials for clay and ceramic production	
PMC552023C	Finish products after firing	
PMC552024C	Hand mould products	
PMC552030C	Operate a firing kiln	
PMC552031C	Operate extrusion equipment	
PMC552032C	Operate pressing equipment	
PMC552040C	Operate glass melting process	
PMC552041C	Operate process ovens	
PMC552042C	Operate blown insulation equipment	
PMC552043C	Operate float forming equipment	
PMC552044C	Operate fibre forming equipment	
PMC552045C	Operate container forming equipment	
PMC552046C	Operate glass printing equipment	
PMC552047C	Operate primary annealing equipment	
PMC552048C	Operate glass finishing equipment	
PMC552049C	Operate on-line stacking and assembly equipment	

Unit code	Title	Prerequisites
PMC552050C	Schedule, cut and bend reinforcement	
PMC552051C	Finish green concrete products	
PMC552052C	Cast moulded concrete products	
PMC552053C	Finish cured concrete products	
PMC552054C	Spin concrete pipes	
PMC552055C	Conduct benching operations	
PMC552056B	Assemble, fabricate and place reinforcement	
PMC552057B	Finish casting operation	
PMC552058B	Demould concrete products	
PMC552060C	Batch mix concrete	
PMC552061C	Deliver concrete to site	
PMC552065B	Prepare asphalt	
PMC552070B	Operate forming equipment	
PMC552071B	Operate wet and dry end equipment	
PMC552072B	Produce fibrous plasterboard	
PMC552090B	Use and maintain tools and equipment for refractory operations	
PMC552091B	Prepare for, install and repair refractory	

Unit code	Title	Prerequisites
	brickwork/blockwork	
PMC552092B	Prepare for and install mouldable refractory materials	
PMC552093B	Prepare for and cast refractory materials	
PMC552094B	Prepare for and apply shotcrete for installation	
PMC561072C	Store materials for production	
PMC561080B	Organise self	
PMC562070B	Move materials	
PMC562071C	Operate bulk materials handling equipment	
PMC562075B	Maintain kiln refractory	
PMC562081B	Deliver customer service	
PMC562083C	Allocate and complete team tasks	
TLIC307C	Drive medium rigid vehicle	
TLIC407D	Drive heavy rigid vehicle	
TLID1007C	Operate a forklift	
	Note: Only one of TLIC307C or TLIC407D may be included in this qualification, not both.	
	Up to four (4) relevant units may be selected from this Training Package, other endorsed Training Packages and accredited courses, where	

Unit code	Title	Prerequisites
	those units are available at Certificate II, III or IV.	

PMC40110 Certificate IV in Manufactured Mineral Products

Modification History

Not applicable.

Description

This qualification covers the skills and knowledge required to perform a range of high level technical operations within the manufactured mineral products industries.

Job roles/employment outcomes

The Certificate IV in Manufactured Mineral Products 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.

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

- cement
- precast concrete
- premixed concrete
- clay products
- ceramic products
- float (flat) glass
- glass containers
- refractories
- plaster (both fibrous plaster and plaster boards)
- fibre cement boards
- ground minerals
- abrasive grinding wheels and cutting discs

- other 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. Credit may be granted towards this qualification by those who have completed PMC30110 Certificate III in Manufactured Mineral Products, 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 PMC50110 Diploma of Manufactured Mineral Products, 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 considerations

There are no specific licences that relate to this qualification. However, 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	• initiate communication about multiple subjects and with multiple audiences • complete incident, technical and other reports • use technical information and manufacturer information • collect, analyse and organise information • communicate problem solutions, ideas and information • use and contribute to workplace documentation • maintain workplace records
Teamwork	• identify and describe own role and role of others • work within and lead a team • resolve conflicts between team members • develop teamwork strategies
Problem solving	• recognise a problem or a potential problem • determine problems needing priority action • refer problems outside area of responsibility to appropriate person • identify appropriate theory base for problem • seek information and assistance as required to solve problems • solve problems within area of responsibility • 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 equipment • determine problems needing action • recommend required action • report problems outside area of responsibility • distinguish between causes of faults

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY	
	• recommend new and improved ways of doing things
Planning and organising	• prioritise actions to achieve required outcomes • plan own work requirements and assist others to plan theirs • 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 • operate within appropriate time constraints, work standards and other requirements • select, use and improve appropriate equipment, materials, processes and procedures • plan to ensure effective production/projects • select and apply standard procedures • identify resource requirements • recognise limitations and seek timely advice
Learning	• ask questions to gain information • identify sources of information to expand knowledge and understanding • lead improvement procedures • lead the development of continuous improvement strategies • assist others develop competency
Technology	• operate, adjust and optimise the operation of equipment • start up and shut down equipment • set up equipment • monitor quality • function and operating principles of equipment • maintain workplace records

Packaging Rules

Packaging Rules

To be awarded the Certificate IV in Manufactured Mineral Products competency must be achieved in **twenty four (24)** units of competency:

- **seven (7)** core units of competency
- **seventeen (17)** 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

Select **seven (7)** core units of competency as specified below.

All **six (6)** of these units must be chosen.

Unit code	Title	Prerequisites
MSAENV272A	Participate in environmentally sustainable work practices	
MSAPMOHS200A	Work safely	
MSAPMSUP100A	Apply workplace procedures	
MSAPMSUP101A	Clean workplace or equipment	
MSAPMSUP102A	Communicate in the workplace	
MSAPMSUP200A	Achieve work outcomes	

Select **one (1)** of the following units. Note that only one of MSAPMOPS101A **OR** PMAOPS101C may be included in this qualification, not both.

Unit code	Title	Prerequisites
MSAPMOPS101A	Make measurements	
PMAOPS101C	Read dials and indicators	

Elective units of competency

Group A - Specialist electives

A minimum of **one (1)** specialist elective unit must be chosen from the list below.

Unit Code	Title	Prerequisite unit
MSAPMOPS400A	Optimise process/plant area	MSAPMSUP390A
MSAPMOPS401A	Trial new process or product	
MSAPMOPS404A	Co-ordinate maintenance	
MSAPMOPS405A	Identify problems in fluid power system	
MSAPMOPS406A	Identify problems in electronic control systems	
PMAOPS402A	Respond to abnormal process situations	MSAPMSUP390A
PMAOPS405A	Operate complex control systems	
PMC554020D	Design and prepare models, moulds and dies	
PMC554090B	Undertake simple refractory design	
PMC554091B	Analyse refractory failures	

Group B - Other electives

The balance of units, to a maximum of **sixteen (16)**, may be drawn in any combination from:

- units not already chosen from Group A above
- Group B units listed below, with a maximum of **thirteen (13)** from Group B2

Group B1

Unit code	Title	Prerequisites
MSACMC411A	Lead a competitive	

Unit code	Title	Prerequisites
	manufacturing team	
MSACMC413A	Lead team culture improvement	
MSACMS401A	Ensure process improvements are sustained	
MSACMT430A	Improve cost factors in work practices	
MSACMT440A	Lead 5S in a manufacturing environment	
MSACMT441A	Facilitate continuous improvement in manufacturing	
MSACMT450A	Undertake process capability improvements	MSACMT452A
MSACMT451A	Mistake proof a production process	
MSACMT452A	Apply statistics to processes in manufacturing	
MSACMT460A	Facilitate the use of planning software systems in manufacturing	MSACMT260A
MSACMT481A	Undertake proactive maintenance analyses	
MSACMT482A	Assist in implementing a proactive maintenance strategy	
MSAENV472A	Implement and monitor environmentally sustainable work practices	

Unit code	Title	Prerequisites
MSAPMOHS400A	Contribute to OHS management system	MSAPMOHS300A MSAPMOHS200A
MSAPMOHS401A	Assess risk	
MSAPMPER400A	Coordinate permit process	MSAPMPER300B MNMC205A
PMASUP420B	Minimise environmental impact of process	
PSPPM402B	Manage simple projects	
TAAASS401C	Plan and organise assessment	
TAAASS402C	Assess competence	
TAAASS403B	Develop assessment tools	
TAAASS404B	Participate in assessment validation	TAAASS402C
	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 Diploma.	

Group B2

Unit code	Title	Prerequisites
MEM09002B	Interpret technical drawing	
MNMC205A	Conduct local risk assessment	

Unit code	Title	Prerequisites
MSACMT230A	Apply cost factors to work practices	
MSACMT231A	Interpret product costs in terms of customer requirements	
MSACMT240A	Apply 5S procedures in a manufacturing environment	
MSACMT250A	Monitor process capability	
MSACMT251A	Apply quality standards	
MSACMT260A	Use planning software systems in manufacturing	
MSACMT270A	Use sustainable energy practices	
MSACMT271A	Use sustainable environmental practices	
MSACMT280A	Undertake root cause analysis	
MSACMT281A	Contribute to the application of a proactive maintenance strategy	
MSAPMOHS110A	Follow emergency response procedures	
MSAPMOHS300A	Facilitate the implementation of OHS for a work group	MSAPMOHS200A
MSAPMOPS100A	Use equipment	
MSAPMOPS200A	Operate equipment	
MSAPMOPS212A	Use enterprise computers or data systems	

Unit code	Title	Prerequisites
MSAPMPER200B	Work in accordance with an issued permit	
MSAPMPER201A	Monitor and control work permits	
MSAPMPER202A	Observe permit work	
MSAPMPER205B	Enter confined space	
MSAPMPER300B	Issue work permits	MNMC205A
MSAPMSUP106A	Work in a team	
MSAPMSUP201A	Receive or despatch goods	
MSAPMSUP210A	Process and record information	
MSAPMSUP230A	Monitor process operations	
MSAPMSUP240A	Undertake minor maintenance	
MSAPMSUP280A	Manage conflict at work	
MSAPMSUP292A	Sample and test materials and product	
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	MSAPMSUP200A
MSAPMSUP303A	Identify equipment faults	
MSAPMSUP310A	Contribute to development of plant documentation	
MSAPMSUP330A	Develop and adjust a production schedule	
MSAPMSUP382A	Provide coaching/mentoring in	

Unit code	Title	Prerequisites
	the workplace	
MSAPMSUP390A	Use structured problem solving tools	
MSL952001A	Collect routine site samples	
MSL973001A	Perform basic tests	
MSL974005A	Perform physical tests	
PMAOPS105C	Select and prepare materials	
PMAOPS216B	Operate local control system	
PMAOPS305B	Operate process control systems	
PMBHAN103C	Shift materials safely by hand	
PMC552002C	Operate equipment to blend/mix materials	
PMC552003C	Operate grinding equipment	
PMC552004C	Prepare for production	
PMC552005C	Process greenware/green products	
PMC552006C	Operate an autoclave	
PMC552007B	Heat accelerate the curing of precast concrete	
PMC552008B	Operate crushing equipment	
PMC552010C	Operate a calcining kiln	
PMC552020C	Operate slip casting equipment	

Unit code	Title	Prerequisites
PMC552021C	Operate manual glazing equipment	
PMC552022C	Prepare materials for clay and ceramic production	
PMC552023C	Finish products after firing	
PMC552024C	Hand mould products	
PMC552030C	Operate a firing kiln	
PMC552031C	Operate extrusion equipment	
PMC552032C	Operate pressing equipment	
PMC552040C	Operate glass melting process	
PMC552041C	Operate process ovens	
PMC552042C	Operate blown insulation equipment	
PMC552043C	Operate float forming equipment	
PMC552044C	Operate fibre forming equipment	
PMC552045C	Operate container forming equipment	
PMC552046C	Operate glass printing equipment	
PMC552047C	Operate primary annealing equipment	
PMC552048C	Operate glass finishing equipment	
PMC552049C	Operate on-line stacking	

Unit code	Title	Prerequisites
	and assembly equipment	
PMC552050C	Schedule, cut and bend reinforcement	
PMC552051C	Finish green concrete products	
PMC552052C	Cast moulded concrete products	
PMC552053C	Finish cured concrete products	
PMC552054C	Spin concrete pipes	
PMC552055C	Conduct benching operations	
PMC552056B	Assemble, fabricate and place reinforcement	
PMC552057B	Finish casting operation	
PMC552058B	Demould concrete products	
PMC552060C	Batch mix concrete	
PMC552061C	Deliver concrete to site	
PMC552065B	Prepare asphalt	
PMC552070B	Operate forming equipment	
PMC552071B	Operate wet and dry end equipment	
PMC552072B	Produce fibrous plasterboard	
PMC552090B	Use and maintain tools and equipment for refractory operations	
PMC552091B	Prepare for, install and	

Unit code	Title	Prerequisites
	repair refractory brickwork/blockwork	
PMC552092B	Prepare for and install mouldable refractory materials	
PMC552093B	Prepare for and cast refractory materials	
PMC552094B	Prepare for and apply shotcrete for installation	
PMC552095B	Prepare for, install and repair ceramic fibre	
PMC553000C	Set up and tune a process	
PMC553010C	Process raw meal into product	PMC552010C
PMC553020C	Prepare moulds and dies	
PMC553021C	Set up and tune glazing equipment	
PMC553040C	Set up and optimise glass forming process	
PMC553041C	Set up and optimise glass furnace process	
PMC553042C	Set up and optimise secondary process	
PMC553050C	Produce architectural precast concrete	
PMC553051B	Produce structural precast concrete	
PMC553070B	Design and construct moulds for fibrous plaster products	PMC552024C
PMC553072B	Model fibrous plaster products	

Unit code	Title	Prerequisites
PMC553080B	Set up and optimise finishing process	
PMC561072C	Store materials for production	
PMC561080B	Organise self	
PMC562070B	Move materials	
PMC562071C	Operate bulk materials handling equipment	
PMC562075B	Maintain kiln refractory	
PMC562081B	Deliver customer service	
PMC562083C	Allocate and complete team tasks	
PMC563081C	Carry out stock control	
TAAASS301B	Contribute to assessment	
TAADEL301C	Provide training through instruction and demonstration of work skills	
TLIC307C	Drive medium rigid vehicle	
TLIC407D	Drive heavy rigid vehicle	
TLID1007C	Operate a forklift	
	Note: Only one of TLIC307C or TLIC407D may be included in this qualification, not both.	
	Up to six (6) relevant units may be chosen from this Training Package, other endorsed Training Packages and accredited courses, where those	

Unit code	Title	Prerequisites
	units are available at Certificate II, III, IV or Diploma.	

PMC50110 Diploma of Manufactured Mineral Products

Modification History

Not applicable.

Description

This qualification covers the skills and knowledge required to perform advanced technical and para-professional operations within the manufactured mineral products industries.

Job roles/employment outcomes

The Diploma of Manufactured Mineral Products is intended for technologists or para-professionals who may have worked their way up through the manufactured mineral products 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.

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:

- cement
- precast concrete
- premixed concrete
- clay products
- ceramic products
- float (flat) glass
- glass containers
- refractories
- plaster (both fibrous plaster and plaster boards)
- fibre cement boards
- ground minerals
- abrasive grinding wheels and cutting discs
- other 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 Manufactured Mineral Products also offers advanced technical training to people who have completed PMC40110 Certificate IV in Manufactured Mineral Products 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 PMC60110 Advanced Diploma of Manufactured Mineral Products, 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, 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	• initiate communication about multiple subjects and with multiple audiences • complete incident, technical and other reports • use technical information and manufacturer information • collect, analyse and organise information • communicate problem solutions, ideas and information • use and develop workplace documentation • maintain workplace records
Teamwork	• identify and describe own role and role of others • work within and lead a team • resolve conflicts between team members • develop teamwork strategies
Problem solving	• recognise a problem or a potential problem • determine problems needing priority action • refer problems outside area of responsibility to appropriate person • identify and develop appropriate theory base for problem • seek information and assistance as required to solve problems • solve problems within area of responsibility • 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 equipment • determine problems needing action • develop and recommend required action • report problems outside area of responsibility • distinguish between causes of faults • recommend new and improved ways of doing things
Planning and organising	• prioritise actions to achieve required outcomes • plan own work requirements and assist others to plan

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY

	theirs • plan and organise activities and projects • 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 • operate within appropriate time constraints, work standards and other requirements • select, use and improve appropriate equipment, materials, processes and procedures • plan to ensure effective production/projects • select and apply standard procedures • identify resource requirements • recognise limitations and seek timely advice
Learning	• ask questions to gain information • identify sources of information to expand knowledge and understanding • lead improvement procedures • lead the development of continuous improvement strategies • assist others develop competency • develop enterprise knowledge • identify and address learning gaps in team
Technology	• operate, adjust and optimise the operation of equipment • develop equipment and process • start up and shut down equipment • set up equipment • monitor quality • function and operating principles of equipment • maintain workplace records

Packaging Rules

Packaging Rules

To be awarded the Diploma of Manufactured Mineral Products 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

Select all **four (4)** units of competency from this list.

Unit code	Title	Prerequisites
MSAENV272A	Participate in environmentally sustainable work practices	
MSAPMOHS200A	Work safely	
MSAPMSUP200A	Achieve work outcomes	
MSAPMSUP210A	Process and record information	

Elective units of competency**Group A - Specialist electives**

A minimum of **two (2)** specialist elective units must be chosen from the list below.

Unit code	Title	Prerequisites
PMAOPS500A	Optimise production systems	
PMAOPS501A	Provide operational expertise to a project team	
PMAOPS505A	Control the process in abnormal situations	

Unit code	Title	Prerequisites
PMAOPS511B	Determine energy transfer loads	
PMAOPS512B	Determine mass transfer loads	
PMAOPS520C	Manage utilities	
PMAOPS521C	Plan plant shutdown	
PMAOPS522A	Coordinate plant shut down	
PMBTECH502B	Review and analyse production trials and specify retrials	
PMC555030C	Analyse equipment performance	
PMC555031B	Choose materials for an application	
	Up to one (1) specialist elective unit may be chosen from Group A in PMC60110 Advanced Diploma of Manufactured Mineral Products.	

Group B - Other elective units

The balance of units, to a maximum of **four (4)**, may be drawn in any combination from:

- units not already chosen from Group A above
- Group B units listed below

Unit code	Title	Prerequisites
LMTGN5004A	Manage installation and commissioning of equipment and systems	

Unit code	Title	Prerequisites
MEM09002B	Interpret technical drawing	
MEM09003B	Prepare basic engineering drawing	MEM09002B
MSACMC610A	Manage relationships with non-customer external organisations	
MSACMC611A	Manage people relationships	
MSACMC612A	Manage workplace learning	
MSACMT452A	Apply statistics to processes in manufacturing	
MSACMT481A	Undertake proactive maintenance analyses	
MSACMT482A	Assist in implementing a proactive maintenance strategy	
MSACMT640A	Manage 5S system in a manufacturing environment	
MSACMT641A	Implement a continuous improvement system	
MSACMT650A	Determine and improve process capability	MSACMT452A
MSACMT660A	Develop the application of enterprise systems in manufacturing	
MSACMT661A	Determine and establish information collection requirements and processes	

Unit code	Title	Prerequisites
MSACMT670A	Develop and manage sustainable energy practices	
MSACMT671A	Develop and manage sustainable environmental practices	
MSACMT681A	Develop a proactive maintenance strategy	
MSAENV472A	Implement and monitor environmentally sustainable work practices	
MSAPMOHS503A	Maintain the workplace OHS management system	
MSAPMOHS510A	Manage risk	
MSAPMOPS401A	Trial new process or product	
PMASUP520B	Review procedures to minimise environmental impact of process	
PSPPM502B	Manage complex projects	
	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, Diploma or Advanced Diploma.	

PMC60110 Advanced Diploma of Manufactured Mineral Products

Modification History

Not applicable.

Description

This qualification covers the skills and knowledge required to perform advanced technical and para-professional operations within the manufactured mineral products industries.

Job roles/employment outcomes

The Advanced Diploma of Manufactured Mineral Products is intended for process plant technologists or para-professionals who may have worked their way up through the manufactured mineral products 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.

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:

- cement
- precast concrete
- premixed concrete
- clay products
- ceramic products
- float (flat) glass
- glass containers
- refractories
- plaster (both fibrous plaster and plaster boards)
- fibre cement boards
- ground minerals
- abrasive grinding wheels and cutting discs
- other 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 Manufactured Mineral Products offers advanced technical training to people who have completed PMC50110 Diploma of Manufactured Mineral Products 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 PMC70110 Vocational Graduate Certificate in Refractories Engineering, 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, 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	• initiate communication about multiple subjects and with multiple audiences • complete incident, technical and other reports • use technical information and manufacturer information • collect, analyse and organise information • communicate problem solutions, ideas and information • use and develop workplace documentation • maintain workplace records
Teamwork	• identify and describe own role and role of others • work within and lead a team • resolve conflicts between team members • develop teamwork strategies
Problem solving	• recognise a problem or a potential problem • determine problems needing priority action • refer problems outside area of responsibility to appropriate person • identify and develop appropriate theory base for problem • seek information and assistance as required to solve problems • solve problems within area of responsibility • 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 equipment • determine problems needing action • develop and recommend required action • report problems outside area of responsibility • distinguish between causes of faults • recommend new and improved ways of doing things
Planning and organising	• prioritise actions to achieve required outcomes • plan own work requirements and assist others to plan

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY

	theirs • plan and organise activities and projects • 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 • operate within appropriate time constraints, work standards and other requirements • select, use and improve appropriate equipment, materials, processes and procedures • plan to ensure effective production/projects • select and apply standard procedures • identify resource requirements • recognise limitations and seek timely advice
Learning	• ask questions to gain information • identify sources of information to expand knowledge and understanding • lead improvement procedures • lead the development of continuous improvement strategies • assist others develop competency • develop enterprise knowledge • identify and address learning gaps in team
Technology	• operate, adjust and optimise the operation of equipment • develop equipment and process • start up and shut down equipment • set up equipment • monitor quality • function and operating principles of equipment • maintain workplace records

Packaging Rules

Packaging Rules

To be awarded the Advanced Diploma of Manufactured Mineral Products competency must be achieved in **fifteen (15)** units of competency:

- **four (4)** core units of competency
- **eleven (11)** 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

Select all **four (4)** units of competency from this list.

Unit code	Title	Prerequisites
MSAENV272A	Participate in environmentally sustainable work practices	
MSAPMOHS200A	Work safely	
MSAPMSUP200A	Achieve work outcomes	
MSAPMSUP210A	Process and record information	

Elective units of competency**Group A - Specialist electives**

A minimum of **two (2)** specialist elective units must be chosen from the list below.

Unit code	Title	Prerequisite unit
MSACMT675A	Facilitate the development of a new product	MSACMT452A
PMAOPS600C	Modify plant	
PMAOPS601A	Debottleneck plant	
PMC556031C	Design structural/mechanical	PMC555031B

Unit code	Title	Prerequisite unit
	components	

Group B - Other electives

The balance of units, to a maximum of **nine (9)**, may be drawn in any combination from:

- units not already chosen from Group A above
- Group B units listed below, with a maximum of **seven (7)** from Group B2

Group B1

Unit code	Title	Prerequisites
PMAOPS500A	Optimise production systems	
PMAOPS501A	Provide operational expertise to a project team	
PMAOPS505A	Control the process during abnormal situations	
PMAOPS511B	Determine energy transfer loads	
PMAOPS512B	Determine mass transfer loads	
PMAOPS520C	Manage utilities	
PMAOPS521C	Plan plant shutdown	
PMAOPS522A	Coordinate plant shutdown	
PMBTECH502B	Review and analyse production trials and specify retrials	
PMC555030C	Analyse equipment performance	

Unit code	Title	Prerequisites
PMC555031B	Choose materials for an application.	

Group B2

Unit code	Title	Prerequisites
LMTGN5004A	Manage installation and commissioning of equipment and systems	
MEM09002B	Interpret technical drawing	
MEM09003B	Prepare basic engineering drawing	MEM09002B
MSACMC610A	Manage relationships with non-customer external organisations	
MSACMC611A	Manage people relationships	
MSACMC612A	Manage workplace learning	
MSACMT452A	Apply statistics to processes in manufacturing	
MSACMT481A	Undertake proactive maintenance analyses	
MSACMT482A	Assist in implementing a proactive maintenance strategy	
MSACMT640A	Manage 5S system in a manufacturing environment	
MSACMT641A	Implement a continuous	

Unit code	Title	Prerequisites
	improvement system	
MSACMT650A	Determine and improve process capability	MSACMT452A
MSACMT660A	Develop the application of enterprise systems in manufacturing	
MSACMT661A	Determine and establish information collection requirements and processes	
MSACMT670A	Develop and manage sustainable energy practices	
MSACMT671A	Develop and manage sustainable environmental practices	
MSACMT681A	Develop a proactive maintenance strategy	
MSAENV672A	Develop workplace policy and procedures for sustainability	
MSAPMOHS503A	Maintain the workplace OHS management system	
MSAPMOHS510A	Manage risk	
MSAPMOPS401A	Trial new process or product	
PMASUP520B	Review procedures to minimise environmental impact of process	
PSPPM502B	Manage complex projects	
	Up to four (4) relevant units may be chosen	

Unit code	Title	Prerequisites
	from this Training Package, other endorsed Training Packages and accredited courses, where those units are available at Certificate IV, Diploma and Advanced Diploma.	

PMC70110 Vocational Graduate Certificate in Refractories Engineering

Modification History

Not applicable.

Description

The Vocational Graduate Certificate in Refractories Engineering has been developed as a technical qualification for people who come to the industry with a relevant qualification, such as a degree in science or engineering (or equivalent) and need specialist refractory knowledge.

This qualification was developed in response to an industry need for specialist refractories skills which are not provided by existing qualifications. There is no current Australian qualification for this target group. It has strong industry support and the qualification and its units of competency reflect the industry requirements. This qualification was developed in liaison with the Institute of Refractories Engineers Australian Branch.

Job roles/employment outcomes

Typical job roles for these people would be project engineer, maintenance engineer, purchasing engineer, area engineer, section manager, operations manager, project controller or project planner in a refractory area. Typically they will have some management/executive responsibility, but require technical competence in refractory related areas to complete this role.

Graduates from this Vocational Graduate Certificate in Refractories Engineering would be able to:

- design new refractory installations
- analyse refractory failures
- specify refractory repairs
- monitor and control new installations and repairs.

This requires knowledge of refractories and also structures.

Application

This qualification applies to recent graduates or graduates with recent refractories experience. It may also be used by those with significant industry experience who wish to upgrade their skills or seek recognition for skills they already possess. Refractories are used by many industry sectors including:

- power generation
- oil refining
- steel making

- aluminium smelting
- foundaries/casting
- glass making
- cement manufacture.

Entry requirements

Entrants to the Vocational Graduate Certificate in Refractories Engineering are required to have one of the following:

- Bachelor Degree in Engineering or related discipline
- Bachelor Degree in Science or related discipline
- a relevant Diploma such as the PMC60110 Advanced Diploma of Manufactured Mineral Products together with significant relevant vocational practice
- relevant extensive vocational practice without formal qualification or with a different qualification to those mentioned above.

For the purposes of this qualification, the term 'vocational practice' is defined as experience of:

- designing of new refractory installations and/or repairs
- project managing refractory installations
- assisting in a significant way with the above.

Licensing considerations

There are no specific licences that relate to this qualification. However, depending on the jurisdiction, licensing or regulatory requirements may apply to the use of some units of competency in this qualification. 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 • 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 • clarify and address 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 optimisation actions
Planning and organising	• organise and prioritise required 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,

EMPLOYABILITY SKILLS QUALIFICATION SUMMARY	
	- processes and procedures - identify resource requirements, document and monitor
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 - 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 Refractories Engineering competency must be achieved in **ten (10)** units of competency:

- three (3)** core units of competency
- seven (7)** elective units of competency chosen from Groups A and B, as described below.

Note: Prerequisite units are listed and must be considered in the total number of units chosen.

Core units of competency

Select all **three (3)** units from this list.

Unit code	Title	Prerequisites
MSAPMOHS200A	Work safely	
PMC557090A	Select refractory materials for an application	

Unit code	Title	Prerequisites
PMC557091A	Design a refractory lining	

Elective units of competency

Group A - Specialist electives

A minimum of **four (4)** units must be selected from the list below.

Unit code	Title	Prerequisites
PMC557092A	Specify and interpret refractory tests	
PMC557093A	Design a refractory/ceramic component	
PMC557094A	Investigate refractory failures	
PMC557095A	Specify and monitor the installation of monolithic/castable refractories	
PMC557096A	Specify and monitor the installation of block/precast refractories	
PMC557097A	Specify and monitor repairs to refractory installations	
PMC557098A	Specify refractory installation systems	

Group B - Other electives

The balance of units, to a maximum of **three (3)**, may be chosen in any combination from:

- units not already chosen from Group A above
- Group B units listed below

Unit code	Title	Prerequisites
MSACMG700A	Review continuous improvement processes	
MSACMG702A	Review manufacturing practice tools and techniques	
MSACMG707A	Respond to a major non-conformance	
MSACMG712A	Lead a problem solving process to determine and solve root cause	
MSAENV672A	Develop workplace policy and procedures for sustainability	
MSL916005A	Manage complex projects	
PMC557001A	Manage trials	
	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 Diploma and above.	

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		

PMC552004C Prepare for production

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers a range of checks required before preparation of raw materials used in the manufacturing process. It involves preparing and selecting materials for production, checking machinery and equipment for operation and rectifying routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for performing a series of checks prior to commencing a variety of operations within the manufactured mineral products industry. It includes the operation of all ancillary equipment. This competency is typically performed by operators working either independently or as part of a 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. Check production plan	1.1. Identify the type of product required, time to run and raw/reclaim materials required 1.2. Check for quantity and quality required and any special requirements 1.3. Check with supervisor/appropriate person if requirements are 'unusual'
2. Identify hazards	2.1. Identify hazards of materials to be used 2.2. Identify hazards in work area 2.3. Implement hazard controls according to procedures 2.4. Report safety concerns according to procedures
3. Assemble raw materials	3.1. Order and check quantities of materials required 3.2. Sample and test materials as required 3.3. Visually check that materials are free from contamination and suitable for production 3.4. Report contamination or other non-conformance
4. Check machinery and equipment	4.1. Check required program 4.2. Check machinery/equipment for operation 4.3. Correct or report maintenance requirements as appropriate 4.4. Check that equipment has been test run 4.5. Check that equipment is set and adjusted according

ELEMENT	PERFORMANCE CRITERIA
	to production schedule as required
5. Rectify routine problems	5.1. Identify the range of faults that can occur during the operation 5.2. Determine and rectify fault causes by procedures 5.3. Identify and rectify equipment failure causes to procedures 5.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures 5.5. Identify non-routine problems and report to designated person

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:

- testing procedures
- impact of contamination
- production schedules
- hazards normally associated with the process and controls as per the hierarchy of control
- underlying causes of faults such as precipitated by:
 - product loading and unloading
 - materials
 - 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	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 process be understood and that the importance of critical material properties and settings 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: • hazards are identified and controls applied • early warning signs of equipment in need of attention/with potential problems are recognised • action is taken to ensure equipment is returned to full performance in a timely manner • communication is timely and effective • problems regarding materials are anticipated and appropriate action is taken. 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

EVIDENCE GUIDE	
	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
Equipment and machinery	Equipment and machinery may include: any processing plant or equipment relevant to this unit of competency
Operation of machinery/equipment	Operation of machinery/equipment include: - visual checks for damage - leaks - obstructions - blockages - component wear
Materials	Raw materials may include: first stage products being prepared for subsequent processes
Typical problems	Typical problems may include:

RANGE STATEMENT	
	- contaminated materials - raw material not to specifications - material variability within specification - equipment malfunctions
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		

PMC552005C Process greenware/green products

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the drying, preparation and other processing of greenware or green products. It involves preparing equipment, loading products, monitoring drying, resolving routine problems and ensuring finished product is to specification.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for conducting activities relevant to the preparation and processing of greenware or green products. It does NOT cover the firing of products in a kiln or similar firing equipment. It does cover warmed or heated curing areas. This unit of competency is typically performed by operators working either independently or as part of a 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 the equipment	1.1. Determine the requirements from the production program 1.2. Identify and set up the racks, shelves or trolleys 1.3. Ensure the equipment is safe for use
2. Control hazards	2.1. Identify hazards from the job to be done 2.2. Identify other hazards in the work area 2.3. Assess the risks arising from those hazards 2.4. Implement measures to control those risks in line with procedures
3. Load products for drying/curing	3.1. Stack or set products to specification 3.2. Ensure correct stacking pattern is used 3.3. Allow adequate space around each item 3.4. Use available space effectively
4. Dry/cure products	4.1. Monitor drying equipment and test products to determine correct conditions 4.2. Adjust temperature and humidity to maintain correct conditions 4.3. Remove product from the area and store appropriately

ELEMENT	PERFORMANCE CRITERIA
5. Finish green products	5.1. Finish products to specifications 5.2. Ensure condition of product is acceptable 5.3. Store products in appropriate area 5.4. Repair product and/or report product faults to the designated person.
6. Rectify routine problems	6.1. Identify the range of faults that can occur during the operation 6.2. Determine and rectify fault causes in accordance with procedures 6.3. Identify and rectify equipment failure causes to procedures 6.4. Make sure appropriate records and log books of equipment operations are maintained to meet procedures 6.5. Identify non-routine problems and report to designated person

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- reading from the production schedule
- stacking greenware to allow efficient drying and curing
- 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:

- surface finish requirements and terms
- nature and purpose of the drying/curing stage

REQUIRED SKILLS AND KNOWLEDGE

- importance of correct moisture content
- importance of correct temperature and air circulation
- consequences of poor stacking
- underlying causes of faults such as precipitated by:
 - dryer/curing kiln
 - air flow/temperature
 - materials

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- greenware is ready for next stage of the process
- drying achieves the specified moisture content
- curing achieves the specified strength
- drying/curing area loaded to requirements
- temperature and humidity are within limits
- product waste levels are low.

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 competency unit (e.g. those parts referring to safety of equipment).

EVIDENCE GUIDE	
	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 will be required as will a bank of questions which will be used to probe the reasoning behind the 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 appropriate to the work being performed and must take into consideration the language and literacy capacity of the candidate.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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
Greenware and green products	Greenware and green products may include: • clay and ceramics products prior to firing • fibre reinforced cement products prior to autoclaving • concrete products such as masonry curing
Equipment	Equipment may include: • hand tools • templates • drying area, cabinets, tunnel, curing kiln • transfer cars, kiln cars, trolleys, shelving or racks • temperature measuring equipment

RANGE STATEMENT	
	moisture measuring equipment (e.g. infra-red moisture meter)
Finishing	Finishing includes operations, such as: - brushing - dressing - fettling - linishing - sanding - sponging - stacking - edge trimming
Typical problems	Typical problems may include: - inspecting and finishing to ensure surfaces are to specification - ensuring moisture content is within requirements - ensuring product strength has been obtained - temperature and humidity control - distribution of product in drying/curing area
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		

PMC552006C Operate an autoclave

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of autoclaves including identifying and isolating equipment malfunctions. It involves operating equipment correctly, monitoring the process and resolving routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators in a plant who are responsible for operating an autoclave to facilitate the curing of products in the glass, cement, clay, ceramic and fibre-cement industries. This unit of competency includes the operation of all ancillary equipment. The unit of competency is typically performed by operators working either independently or as part of a work 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 the equipment for production	1.1. Conduct equipment pre-startup procedure and visual checks according to enterprise procedure 1.2. Set up and configure equipment startup function in accordance with procedures/work instructions 1.3. Load raw materials onto autoclave cars in accordance with procedures/work instructions 1.4. Charge materials into autoclave and close and secure the vessel in accordance with procedures/work instructions
2. Operate equipment	2.1. Start up equipment in accordance with procedures/work instructions 2.2. Ensure equipment is operated in accordance with established enterprise procedures
3. Monitor and record operation	3.1. Monitor equipment performance in accordance with work instructions and manufacturer's specifications 3.2. Monitor operating pressures and temperatures 3.3. Adjust and control equipment to ensure correct product quality 3.4. Complete appropriate records and logs
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes by

ELEMENT	PERFORMANCE CRITERIA
	procedures/work instructions 4.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 4.5. Identify non-routine problems and report to designated person
5. Shut down equipment	5.1. Shut down equipment and depressurise vessel in accordance with work instructions 5.2. Open the vessel and discharge cured product 5.3. Complete appropriate records and logs 5.4. Ensure autoclave cars are clear of all product and left ready for reuse 5.5. Shut down equipment in an emergency situation
6. Prepare equipment for maintenance	6.1. Isolate equipment in accordance with work instructions 6.2. Remove any broken materials safely 6.3. Make sure area is clear and safe for maintenance
7. Control hazards	7.1. Identify hazards from the autoclave 7.2. Identify other hazards in autoclave area 7.3. Assess the risks arising from those hazards 7.4. Implement measures to control those risks in line with 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 and relevant regulatory requirements within time constraints and in a manner relevant to the operation of the equipment
- conveying information relevant to the operation clearly and effectively

REQUIRED SKILLS AND KNOWLEDGE

- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- hazards associated with and sequence of isolation procedures
- operational processes and functions, including startup and shutdown processes
- composition and nature of finished product
- construction and limitations of the equipment
- out of specification situations
- types of defects/faults
- electrical/instrumental causes of malfunctions

Evidence 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 the process be understood and that the importance of critical 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:

- startup and shutdown procedures are applied without variation
- signals and alarms are responded to immediately
- isolation procedures for maintenance are followed
- all OHS requirements are followed.

Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of

EVIDENCE GUIDE	
	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	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	All operations are performed in accordance with standard procedures and work instructions
Variations	Variations may include: nature and type of plant configuration

RANGE STATEMENT	
	• nature and type of material or product to be autoclaved • safe work practices and the use of protective clothing, hard hats and safety glasses
Checking equipment	Checking equipment includes: • vessel door closing and locking equipment • vessel cars • steam and pressure generation equipment
Use of equipment	Use of equipment includes: • instruments and PLCs but not control panels • measuring and/or recording equipment • communication equipment
Typical problems	Typical problems include: • equipment malfunctions • temperature or pressure fluctuations • product quality variations • material/feed variations • vessel pressure losses
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		

PMC552007B Heat accelerate the curing of precast concrete

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers high and low pressure steam curing of precast concrete pipes and other concrete products. It involves preparing, operating and monitoring equipment, resolving routine problems and preparing equipment for maintenance.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for steam curing of precast concrete pipes and other concrete products. This unit of competency also includes operation of all ancillary equipment. This unit of competency is typically performed by operators working either independently or as part of a work 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 the equipment for production	1.1. Conduct equipment pre-startup procedure and visual checks according to enterprise procedures 1.2. Set up and configure equipment startup function in accordance with procedures/work instructions 1.3. Ensure appropriate presetting period has been observed 1.4. Load mould (containing green concrete product) onto transfer car and move to steam chamber in accordance with procedures/work instructions 1.5. Cover mould as specified 1.6. Close and secure the steam chamber in accordance with procedures/work instructions
2. Operate equipment	2.1. Start up equipment in accordance with procedures/work instructions 2.2. Ensure equipment is operated in accordance with established enterprise procedures
3. Monitor and record operation	3.1. Monitor equipment performance in accordance with work instructions and manufacturer's specifications 3.2. Monitor operating pressures and temperatures 3.3. Ensure the rate at which the concrete temperature increases is even, and that it doesn't exceed maximum temperature specified 3.4. Adjust and control equipment to ensure correct

ELEMENT	PERFORMANCE CRITERIA
	product quality 3.5. Complete appropriate records and logs
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes by procedures/work instructions 4.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 4.5. Identify non-routine problems and report to designated person
5. Shut down equipment	5.1. Shut down steam and depressurise chamber in accordance with work instructions 5.2. Allow product to cool gradually and evenly 5.3. Open the chamber and discharge cured product 5.4. Complete appropriate records and logs 5.5. Ensure transfer cars are clear of all product and left ready for reuse 5.6. Shut down equipment in an emergency situation
6. Prepare equipment for maintenance	6.1. Isolate equipment in accordance with work instructions 6.2. Remove any broken materials safely 6.3. Make sure area is clear and safe for maintenance
7. Control hazards	7.1. Identify hazards from the job to be done 7.2. Identify other hazards in the work area 7.3. Assess the risks arising from those hazards 7.4. Implement measures to control those risks in line with procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

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:

- isolation procedures
- steam hazards
- operational processes and functions, including start up and shut down processes
- composition and nature of finished product
- construction and limitations of the equipment
- out of specification situations
- types of defects/faults
- underlying causes of faults such as precipitated by:
 - electrical/instrumental failures
 - steam pressure differentials
 - time cycle irregularities

Evidence 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 the process be understood and that the importance of critical settings and readings are known.

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

EVIDENCE GUIDE	
	action. Consistent performance should be demonstrated. In particular look to see that: • startup and shutdown procedures are applied without variation • signals and alarms are responded to immediately • isolation procedures for maintenance are followed • all OHS requirements are followed. 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

RANGE STATEMENT	
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.
Operation of steam chambers	This unit includes the operation of various steam chambers for the curing of concrete products and pipes and may include: • purpose built, low pressure steam chambers • autoclaves (high or low pressure) • temporary means of retaining low pressure steam near the curing concrete product
Variations	Variations include: • nature and type of plant configuration • nature of curing process (e.g. hot water, low pressure steam, high pressure steam, autoclaving) • nature and type of steam chamber (e.g. tarpaulin cover, steam chamber and autoclave) • nature and type of product to be cured • safe work practices and the use of protective clothing, hard hats and safety glasses
Checking equipment	Checking equipment includes: • chamber doors and locking equipment • transfer cars to fill chambers • steam and pressure generation equipment • pressure and temperature gauges
Equipment	Equipment may include: • instruments and PLCs but not control panels • measuring and/or recording equipment • communication equipment • tarpaulins used to cover concrete
Typical problems	Typical problems may include: • equipment malfunctions • temperature or pressure fluctuations • product quality variations • material/feed variations • chamber pressure losses

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	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		

PMC552010C Operate a calcining kiln

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operating of a calcining kiln. It involves conducting safety and system checks, operating equipment, monitoring the process and identifying and isolating equipment malfunctions.

Application of the Unit

Application of the unit	This unit of competency applies to plant operators in a large plant who are responsible for the operation of cement making and lime making kilns, and can cover similar calcining operations such as making plaster. The type of operation will depend on: • nature and type of plant configuration • type of manufacturing process as to whether wet, dry or semi-dry. This unit does NOT require the operation of a central control panel. 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 the equipment for production	1.1. Conduct equipment pre-startup procedure and visual checks according to enterprise procedure checklist 1.2. Set up and configure equipment startup function complying with procedures 1.3. Load raw materials in accordance with work instructions
2. Operate equipment and check on support equipment	2.1. Start up equipment in accordance with work instructions 2.2. Ensure equipment is operated in accordance with established enterprise procedures 2.3. Check on the operation of support equipment such as grinding mills, pneumatics pumps, slurry pumps, dust collectors, mixing and blending silos, vibrating screens, rotary kilns; and on bulk storage silos

ELEMENT	PERFORMANCE CRITERIA
3. Monitor and record operation	3.1. Monitor equipment performance in accordance with work instructions and manufacturer's specifications 3.2. Monitor non-conforming product against customer specifications 3.3. Adjust and control equipment to ensure correct product quality 3.4. Complete final inspection checks 3.5. Complete appropriate records and logs
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes by procedures 4.3. Identify and rectify equipment failure causes in accordance with procedures 4.4. Make sure appropriate records and log books of equipment operations are maintained to meet procedures 4.5. Identify non-routine problems and report to designated person
5. Shut down equipment	5.1. Ensure line is clear of all product and left ready for startup 5.2. Shut down equipment in accordance with work instructions 5.3. Complete appropriate records and logs 5.4. Shut down equipment in an emergency situation
6. Prepare equipment for maintenance	6.1. Isolate equipment in accordance with work instructions 6.2. Remove any broken materials safely 6.3. Make sure area is clear and safe for maintenance
7. Control hazards	7.1. Identify hazards in the calcining work area 7.2. Assess the risks arising from those hazards 7.3. 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 AND KNOWLEDGE

Required skills

Required skills include:

- recognising variances in the process conditions and the equipment which will lead to out of specification production
- 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 the equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- isolation procedures
- chemistry and physics of cement/lime/plaster making processes (as appropriate)
- operational processes and functions, including startup and shutdown processes
- composition and nature of raw materials and finished product
- construction and limitations of the equipment
- out of specification situations
- distinguish between:
 - raw materials
 - equipment
 - types of defects/faults
 - electrical/instrumental causes of malfunctions

Evidence 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 the process be understood and that the importance of critical settings and readings is known. Competence must be demonstrated in the ability to recognise and analyse

EVIDENCE GUIDE	
	potential situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • startup and shutdown occurs first time • signals and alarms are responded to immediately • all OHS requirements are followed. 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	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

RANGE STATEMENT	
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	This unit includes all such items of equipment and unit operations which form part of the kiln system. These may include: • instrument panels (local) • measuring and recording equipment • communication equipment • hand tools • emergency stop buttons and lanyards • safety clothing and equipment
Typical problems	Typical problems may include: • equipment malfunctions • temperature fluctuations • quality of product • material/feed variations • spillages and leakages
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		

PMC552020C Operate slip casting equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of slip casting equipment used for production of clay and ceramic products, including the rectification of problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for following procedures to make slip cast products. This competency includes the operation of all ancillary equipment. This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic work. It does NOT include drying, firing or finishing operations. This unit of competency is typically performed by operators working either independently or as part of a 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. Prepare the forming equipment	1.1.Determine the product formation requirements from the production program 1.2.Ensure the required moulds are in place 1.3.Ensure the equipment is set up and prepared as required 1.4.Ensure the required raw materials are selected and poured or connected to the equipment 1.5.Ensure the equipment is safe to use
2. Operate forming equipment	2.1.Operate equipment to produce product to requirements 2.2.Remove product from the mould 2.3.Monitor and adjust slip properties as required 2.4.Transfer product to drying racks/conveyor/trucks as required 2.5.Record production data as required
3. Control hazards	3.1.Identify hazards from the job to be done

ELEMENT	PERFORMANCE CRITERIA
	3.2. Identify other hazards in the work area 3.3. Assess the risks arising from those hazards 3.4. Implement measures to control those risks in line with procedures
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes by procedures 4.3. Identify and rectify equipment failure causes to procedures 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures 4.5. Identify non-routine problems and report to designated person

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 and taking appropriate action
- implementing enterprise's procedures and relevant regulatory requirements within time constraints and in a manner relevant to the operation of the casting equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- slip casting process
- mould purpose and fundamentals
- determining correct wall thickness
- slip consistency and properties
- distinguish between causes of faults such as:
 - mould condition
 - equipment malfunction

REQUIRED SKILLS AND KNOWLEDGE

- mould removal
- slip consistency
- product wall thickness

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- moulds are clean and ready
- slip is applied correctly
- excess slip is removed as required
- cast is removed cleanly
- mould life is preserved
- formed product meets requirements
- material handling methods and waste levels are consistent to standards.

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

EVIDENCE GUIDE	
	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
Operation of equipment	This unit includes the operation of equipment used for the casting of clay and ceramic products. It includes the processes: • casting (including medium pressure casting) • punching • palleting • sponging and fettling • use of hand tools This competency includes the operation of all ancillary equipment and the operation of plant using PLCs where appropriate although the use of control panels is covered by another unit
Product requirements	Product requirements include: • specified thickness is achieved • proper casting time is allowed • excess slip is removed
Removing product from mould	Removing product from mould includes ensuring:

RANGE STATEMENT	
	• condition of the product is acceptable • mould condition is acceptable for reuse • enterprise procedures are followed • equipment is cleaned and readied for reuse
Typical problems	Typical problems may include: • checking for mould deterioration • slip consistency • product wall thickness • identifying piece faults

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC552021C Operate manual glazing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of manual glazing and decorating equipment used for clay and ceramic product production.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating glazing, printing and finishing equipment to complete fired products. This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic work. It does NOT include: • product forming and drying • product firing • setting up automated glazing equipment. This competency is typically performed by operators working either independently or as part of a 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. Prepare glazing and decorating equipment	1.1.Determine glazing and decorating requirements from production schedule 1.2.Adjust equipment as required 1.3.Connect glaze or surface materials to glazing and decorating equipment 1.4.Check equipment operation and safety specifications
2. Apply glaze or surface materials to formed products	2.1.Set up glaze application for operation 2.2.Apply glaze to produce the specified thickness 2.3.Recover excess or spilt glaze for treatment or recycling 2.4.Shut down and unload equipment at conclusion of glazing to procedures, ensuring that products are stored in the appropriate area
3. Print fired products	3.1.Operate printing equipment to produce a correctly

ELEMENT	PERFORMANCE CRITERIA
	registered decoration 3.2. Report printing equipment faults to the designated person 3.3. Shut down and unload equipment at conclusion of printing to specifications, ensuring that products are stored in the appropriate area
4. Repair glaze faults	4.1. Apply glaze repair techniques to produce a properly finished product 4.2. Remove all glaze faults 4.3. Reglaze repaired area with the specified glaze 4.4. Clear work area at the conclusion of the glaze repairing to procedures 4.5. Store products in the appropriate area
5. Rectify routine problems	5.1. Identify the range of faults that can occur during the operation 5.2. Determine and rectify fault causes according to procedures 5.3. Identify and rectify equipment failure causes according to procedures 5.4. Complete appropriate records and log books of equipment operations to meet procedures 5.5. Identify non-routine problems and report to designated person
6. Control hazards	6.1. Identify hazards from the job to be done 6.2. Identify other hazards in the work area 6.3. Assess the risks arising from those hazards 6.4. Implement measures to control those risks in line with 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 and taking

REQUIRED SKILLS AND KNOWLEDGE

- appropriate action
- implementing enterprise's procedures and relevant regulatory requirements within time constraints and in a manner relevant to the operation of the glazing and decorating equipment
- reading and numeracy to interpreting workplace documents and technical information

Required knowledge

Required knowledge includes:

- glaze composition and function
- decal construction and application techniques
- glaze application techniques (including hand dipping and spraying)
- distinguish between causes of problems such as:
 - product surface condition
 - equipment problems
 - glaze properties

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- glaze application is within requirements
- equipment is used as required
- glazing faults are recognised and categorised correctly.

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

EVIDENCE GUIDE	
	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
Products	Products may include: • cups, saucers • tiles • bricks • sanitary ware • bathroom fittings • insulators
Equipment	Equipment may include:

RANGE STATEMENT	
	• belt feed hopper • dipping equipment • hand spray equipment • screen printers • silk screens • vibrating hoppers
Processes	Processes may include: • decorating • dry glaze/material • glaze fault repair • manual dip • manual spray • oversand spraying • reglaze (repaired products) • silk screen printing • waterfall/flinger/bell • wet glaze/material
Materials	Materials may include: • artwork • colours • cover coat • dry glaze dusts • frits • glazed products • liquid glaze • paints • sand • slurry
Typical problems	Typical problems may include: • glaze application faults (e.g. non-adherence or runs) • applicator equipment problems • product surface unsuitable for glaze application • glaze consistency • contamination
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

RANGE STATEMENT

	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		

PMC552022C Prepare materials for clay and ceramic production

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of equipment used to prepare a range of raw materials used in clay and ceramic product production.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for using equipment to load and prepare clays and other materials for ceramic production. Operators must be able to determine requirements and quantities of materials from the production schedule and product specifications, and determine the adjustments required to meet the production needs. This competency does NOT include bulk raw materials blending and forming processes. This competency is typically performed by operators working either independently or as part of a 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. Mix raw materials	1.1.Receive, sample and store raw materials as required 1.2.Load and start mixing equipment to procedures 1.3.Operate mixing equipment to produce materials as specified 1.4.Operate mixing equipment within specifications 1.5.Carry out routine maintenance to specifications 1.6.Unload and shut down mixing equipment to specifications 1.7.Store materials as required
2. Settle mixtures as required	2.1.Operate pumps and valves to move materials as required 2.2.Load materials into tank as required 2.3.Produce a properly settled mixture 2.4.Pump mixture to appropriate storage after treatment 2.5.Carry out routine maintenance to settling equipment to specifications

ELEMENT	PERFORMANCE CRITERIA
	2.6. Report sediment status to designated person
3. Control moisture of mixtures	3.1. Operate equipment to produce clay with the correct moisture content 3.2. Carry out routine maintenance to moisture control equipment to specifications 3.3. Unload and shut down moisture control equipment as required 3.4. Store materials as required
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes by procedures 4.3. Identify and rectify equipment failure causes to procedures 4.4. Maintain appropriate records and log books of equipment operations in accordance with procedures 4.5. Identify non-routine problems and report to designated person
5. Control hazards	5.1. Identify hazards from the job to be done 5.2. Identify other hazards in the work area 5.3. Assess the risks arising from those hazards 5.4. Implement measures to control those risks in line with 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 and taking appropriate action
- implementing enterprise's procedures and relevant regulatory requirements within 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 SKILLS AND KNOWLEDGE

Required knowledge includes:

- source and properties of typical raw materials
- operation of the preparation equipment
- consistency of the prepared materials
- distinguish between causes of faults such as:
 - material variations
 - specification or recipe tolerance
 - equipment malfunction

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- raw materials are correctly selected
- preparation is as specified
- completed products meet specifications
- performance of materials is as required.

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

EVIDENCE GUIDE	
	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	This unit may be assessed in conjunction with: <i>PMC552002B Operate equipment to blend/mix materials.</i> 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
Materials	Materials may include: - additives - body materials - glaze pigments and stains - slip - waste
Equipment	Equipment may include: - ball mill - blunger - bobcat - box feeder

RANGE STATEMENT	
	• filter press and filters • fine rolls • fork lift truck • front end loader • hammer mill • hygrometer • magnet • mortar and pestle • power consumption gauge • pug mill • rotameter • sieves and screens • spray drying tower • storage room • tanks and silos • tempering machine • thermometer • timing equipment • weighing equipment • PLCs • scrapper • penetrometers • balances • infrared • microwave
Processes	Processes may include: • batch • continuous • dry materials • wet materials
Typical problems	Typical problems may include: • adjustments to allow for materials variations • equipment malfunction • contamination
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

RANGE STATEMENT

	precedence

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC552023C Finish products after firing

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the finishing operations for clay and ceramic products to prepare them for further processing or packaging.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for carrying out the final inspections and repairs, if necessary, to fired products. The operator must be able to determine production requirements from documents (e.g. production schedules) and product requirements from product specifications and procedures. This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic work. It does NOT include initial forming or firing, or packaging.

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. Inspect and sort products	1.1. Grade products to ensure enterprise standards are met 1.2. Mark items with code to indicate grade/batch
2. Finish and assemble products	2.1. Apply finishing techniques to produce a properly finished product, as required 2.2. Assemble products to specification, as required 2.3. Maintain appropriate records and log books of equipment operations to meet procedures/work instructions
3. Rectify routine problems	3.1. Identify the range of faults that can occur during the operation 3.2. Determine and rectify fault causes in accordance with procedures/work instructions 3.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 3.4. Identify non-routine problems and report to

ELEMENT	PERFORMANCE CRITERIA
	designated person
4. Control hazards	4.1. Identify hazards from the job to be done 4.2. Identify other hazards in the work area 4.3. Assess the risks arising from those hazards 4.4. Implement measures to control those risks in line with 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 potential problems and taking appropriate action
- implementing enterprise's standard procedures and work instructions and relevant regulatory requirements within 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:

- attributes of in-specification product
- types of manufacturing blemishes
- use of finishing equipment
- distinguish between causes of faults such as:
 - forming
 - firing
 - finishing

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	Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • defects capable of rectification are recognised and dealt with • defects unable to be rectified are identified and product rejected • product is handled appropriately.
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	This unit may be assessed in conjunction with: • PMC561080B Organise self • MSAPMSUP106A Work in a team • MSAPMOHS200A Work safely. 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
Enterprise standards	Enterprise standards include: • colour is to standard • shape is satisfactory • structural appearance is to specification • surface finish is to specification • product is to specified size, squareness, profile, concentricity, straightness and flatness
Products	This unit includes all products after firing, such as: • bisque • glost • decoration
Materials and processes	This unit includes: • materials from: • adhesives • cisterns • inserts • insulators • jugs • switch gear • tiles • tessellations • pipes • processes including: • foot polishing • hand assembly • measurements

RANGE STATEMENT	
	• pin grinding • sorting • tile splitting • operation of all ancillary equipment including: • automatic and manual foot polishers • bench and hand grinders • colour standards • jigs • rulers and tapes • templates • PLCs (but not control panels)
Typical problems	Typical problems may include: • determination of surface quality within specification • colour, shape, structure and surface finish faults • repairing or scrapping of damaged parts
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		

PMC552024C Hand mould products

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the hand moulding of ceramic, plaster and other materials and the production of special purpose components/products. It involves selecting and preparing moulds, finishing and storing components and rectifying faults or equipment failures.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for determining production requirements and quantities from production schedules and product requirements from specifications or similar documents. This unit involves the hand moulding of clay, ceramic, plaster and other products and may also be relevant to craft practitioners producing ceramic work. This competency is typically performed by operators working either independently or as part of a 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. Assemble and prepare the mould or former	1.1. Establish a safe working environment to procedures 1.2. Identify and prepare the appropriate mould or former 1.3. Level and secure the mould or former to procedures 1.4. Check that the base is stabilised and correctly mounted as required to facilitate rolling or turning out 1.5. Position inserts or loose pieces as required 1.6. Apply the correct stripping agent
2. Mould materials	2.1. Prepare the material mix or obtain the material from the batch preparation unit 2.2. Provide an adequate supply of material to meet production requirements 2.3. Introduce material to the workpiece cavity and compact to procedures 2.4. Check inserts or loose pieces and secure to avoid movement during moulding

ELEMENT	PERFORMANCE CRITERIA
	2.5. Employ safe working practices consistent with procedures 2.6. Roll and strip/turn out the component for finishing
3. Finish the component/ product	3.1. Repair defects occurring during the moulding process 3.2. Remove inserts or loose pieces and replace in mould or former 3.3. Prepare the surface of the component for the application of any surface finishes 3.4. Cure or dry the components to specification 3.5. Return mould and/or segments for re-use or storage in accordance with requirements
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes according to procedures 4.3. Identify and rectify equipment failure causes according to procedures 4.4. Make sure appropriate records and log books of equipment operations are maintained to meet procedures 4.5. Identify non-routine problems and report to designated person
5. Inspect and store components	5.1. Inspect component for defects 5.2. Store the component to specifications and 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 abnormal operating conditions and alerting appropriate individuals
- implementing enterprise procedures and relevant regulatory requirements within

REQUIRED SKILLS AND KNOWLEDGE

appropriate time constraints and in a manner relevant to the operation of the equipment/process

- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- appropriate preparation and handling of moulds and formers
- preparation of adequate material mix and standards
- preparing, curing and drying components to specifications
- safe completion of hand moulding products
- appropriate safety procedures concerning the handling of moulds and formers
- procedures relating to the reporting of hazardous conditions
- the content of and handling characteristics of the materials being moulded

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- types of raw materials and finishing materials are able to be identified
- OHS and safe work practices are followed
- component movements are accompanied by appropriate safe working practices
- preparation of moulds and moulding materials to specification

EVIDENCE GUIDE	
	• basic mould or former maintenance and inspection practices are carried out.
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
Typical problems	Typical problems may include: • maintaining correct distribution and compaction of materials • maintaining sectional profiles in accordance

RANGE STATEMENT	
	with specifications maintaining cleanliness and specification of materials
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		

PMC552030C Operate a firing kiln

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of a firing kiln to fire clay and ceramic products. It involves preparing the kiln, loading the kiln, monitoring operations and solving operational problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating a firing kiln and resolving routine problems in a large plant. This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic work. This unit does NOT apply to forming, drying prior to firing, finishing or operation of rotary kilns. This competency is typically performed by operators working either independently or 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		

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 the firing equipment	1.1. Determine the firing requirements from the production program 1.2. Identify and set up the kiln cars or furniture 1.3. Ensure kiln refractories are within specification, including kiln cars, kiln lining and refractories at burners, as appropriate 1.4. Ensure the firing equipment is safe to use 1.5. Check for fuel feed obstructions and clear burner pathways
2. Load kiln	2.1. Ensure products are set or stacked to specification 2.2. Ensure correct stacking pattern is used 2.3. Ensure adequate space is allowed around each item 2.4. Use kiln space effectively
3. Monitor kiln operation	3.1. Monitor kiln firing to ensure temperature rise and fall rate is to specification 3.2. Monitor and record kiln car movement, or kiln

ELEMENT	PERFORMANCE CRITERIA
	contents 3.3. Monitor and adjust kiln heating equipment (elements or burners) and record temperature gradient details 3.4. Monitor the kiln atmosphere 3.5. Monitor for correct operation of kiln 3.6. Move kiln car or kiln contents to the appropriate storage area 3.7. Check and record condition of products leaving the kiln
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures/work instructions 4.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 4.5. Identify non-routine problems and report to designated person
5. Control hazards	5.1. Identify hazards in kiln 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

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

REQUIRED SKILLS AND KNOWLEDGE

- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- stages and critical transitions during the firing process
- kiln temperature profile and deviations allowed
- importance of stacking patterns
- consequences of variations in the firing process
- underlying causes of faults such as precipitated by:
 - firing/temperature profile
 - drying
 - materials
 - stacking or distribution of product in kiln

Evidence 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

Assessment for this unit of competency will be on an operating 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:

- kiln or kiln car is loaded to requirements
- kiln firing is to requirements
- temperature rise/fall rates are to specification.

EVIDENCE GUIDE	
	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	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	All operations are performed in accordance with standard procedures and work instructions

RANGE STATEMENT	
Clay and ceramic products	Clay and ceramic products may include: • bricks • tiles and pipes • ceramic products • crockery • sanitary ware • insulators or thermal ceramics
Equipment and unit operations	This unit includes all such items of equipment and unit operations which form part of the kiln system. These may include: • kilns: batch, tunnel, top-hat, shuttle and roller hearth • kilns: oil, gas, electric, coal and wood fired • optical and thermocouple pyrometers • kiln cars, racking or other kiln furniture • PLCs, control panels, control computers
Typical problems	Typical problems may include: • ensuring moisture content of product prior to firing is within specification • furnace temperature profile variations • distribution of product in kiln or on kiln car • correct transition through quartz inversion, as appropriate • distortion of refractories or mechanical failures
Occupational health and safety (OHS)	The identification and control of hazards and the application of OHS are to be in accordance with current, applicable legislation and regulations, and company procedures

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC552031C Operate extrusion equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of extrusion equipment including identifying and isolating equipment malfunctions. It involves operating equipment correctly and safely, monitoring equipment and facilitating output changes.

Application of the Unit

Application of the unit	This unit of competency applies to operators in a large plant who are responsible for looking after the operation of mechanical forming equipment, including extruders and ancillaries, for clay, ceramic and concrete products. This unit does NOT apply to presses or back stamping, slip forming or manual forming. This unit does NOT require the operation of a central control panel. This competency is typically performed by operators working either independently or 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	

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 the extrusion equipment	1.1.Determine the product formation requirements from the production program 1.2.Ensure the required change parts are in place 1.3.Ensure the required raw materials are selected and loaded or connected to the equipment 1.4.Ensure the equipment is safe to use
2. Operate forming equipment	2.1.Ensure correct vacuum is applied to raw material 2.2.Operate equipment to produce product of the required shape, dimensions and consistency 2.3.Monitor equipment conditions and adjust as required 2.4.Monitor and adjust product properties as required 2.5.Record production data as required
3. Operate surface finishing equipment	3.1.Operate surface patterning equipment as required 3.2.Operate frit application and similar equipment as

ELEMENT	PERFORMANCE CRITERIA
	required 3.3. Monitor operations and adjust/refill as required 3.4. Apply glazing material as required
4. Unload and shut down extrusion equipment	4.1. Unload and shut down extrusion equipment at conclusion of the production run to requirements 4.2. Clean up work area and perform housekeeping duties 4.3. Store materials appropriately
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. Control hazards	6.1. Identify hazards in extruder 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 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 and relevant regulatory requirements within time constraints and in a manner relevant to the operation of the equipment
- conveying information relevant to the operation clearly and effectively
- reading and numeracy to interpret workplace documents and technical information

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Required knowledge includes:

- composition and nature of the products being manufactured
- construction and limitations of the equipment
- startup and shutdown processes
- adjustments required
- ability to distinguish between causes of faults such as:
 - material/moisture
 - equipment adjustment/set up
 - 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, 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 extrusion 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:

- extruder is working within limits
- product meets size and consistency parameters
- waste is properly handled
- product is formed without surface blemishes or damage
- surface treatments are applied to requirements.

Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of

EVIDENCE GUIDE	
	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	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	All operations are performed in accordance with standard procedures and work instructions
Equipment and unit operations	This unit includes all such items of equipment and unit operations which form part of the extrusion

RANGE STATEMENT	
	system. These may include: • pug mill • extruder including dies, wire trims or blades • surface treatment applications, including frit or glaze • impression rollers or moulds • wire cutting machines • transfer machines
Typical problems	Typical problems may include: • moisture content not within specifications • maladjustment of the cutting wires • damage to the product
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		

PMC552032C Operate pressing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of pressing equipment including identifying and isolating equipment malfunctions. It involves preparing equipment for operation, monitoring equipment and facilitating output changes.

Application of the Unit

Application of the unit	This unit of competency applies to operators in a large plant who are responsible for looking after the operation of mechanical press forming equipment for clay, ceramic and concrete products. This unit does NOT apply to extruding, slip forming, or manual forming. This competency is typically performed by operators working either independently or 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		

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 the pressing equipment	1.1. Determine the product formation requirements from the production program 1.2. Ensure the required change parts are in place 1.3. Ensure the required raw materials are selected and loaded or connected to the equipment 1.4. Ensure the equipment is safe to use
2. Operate pressing equipment	2.1. Operate equipment to produce product of the required shape, dimensions and consistency 2.2. Monitor equipment conditions and adjust as required 2.3. Monitor and adjust product properties as required 2.4. Record production data as required
3. Unload and shut down pressing equipment	3.1. Unload and shut down pressing equipment at conclusion of the production run to requirements 3.2. Clean up work area and perform housekeeping 3.3. Store materials appropriately

ELEMENT	PERFORMANCE CRITERIA
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures/work instructions 4.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 4.5. Identify non-routine problems and report to designated person
5. Control hazards	5.1. Identify hazards in pressing 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

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 or equipment operation
- implementing the enterprise's procedures and relevant regulatory requirements within time constraints and in a manner relevant to the operation of the equipment
- conveying information relevant to the operation clearly and effectively
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the products being manufactured
- construction and limitations of the equipment
- startup and shutdown processes
- adjustments required

REQUIRED SKILLS AND KNOWLEDGE

- ability to distinguish between causes of faults such as:
 - material/moisture variations
 - equipment adjustment/set up variations
 - maintenance 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

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 pressing 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:

- dies/moulds are in satisfactory condition
- product is to specification (size, shape and consistency)
- press is operating as required.

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

EVIDENCE GUIDE	
	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. 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	This unit includes all such items of equipment and unit operations which form part of the pressing system. These may include: • moulds • presses • press dies • PLCs where fitted
Typical problems	Typical problems may include: • moisture content not within specifications • unsatisfactory alignment • damage to the product

RANGE STATEMENT	
	• uneven distribution of material in mould • incorrect amount of fill in mould • incorrect pressure/vibration for product
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		

PMC552040C Operate glass melting process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of primary melting furnaces. It involves preparing and operating glass melting equipment, monitoring process operations and making necessary adjustments, identifying and solving routine problems and undertaking minor maintenance on equipment.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating primary melting furnaces used in glass production or the forming of glass products directly from a melting furnace. This unit does NOT apply to the operation of furnaces used for reheating glass product, which is covered by <i>PMC552041C Operate process ovens</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 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. Prepare the melting equipment	1.1. Establish production program and melting guidelines from the job specifications/work instructions 1.2. Conduct furnace pre-startup procedure according to enterprise procedure checklist 1.3. Ensure furnace startup function complies with standard operating procedures 1.4. Ensure glass melting equipment is operated in accordance with established enterprise procedures
2. Test furnace back-up equipment	2.1. Make sure furnace back-up equipment test schedule is maintained 2.2. Conduct back-up equipment test procedures to meet specific enterprise requirements
3. Melt raw materials	3.1. Interpret the molten glass mix and required furnace operation from job specifications 3.2. Melt glass and monitor furnace and other operating

ELEMENT	PERFORMANCE CRITERIA
	parameters in accordance with established enterprise procedures
4. Monitor and interpret data and adjust operation	4.1. Monitor instruments and control panels, and interpret test results for fluctuations, variations and trends 4.2. Monitor plant and process and deduce conditions of materials in process and products being made 4.3. Determine appropriate action to improve process operation 4.4. Adjust furnace controls to ensure glass melt parameters are maintained to job specifications 4.5. Check that process operation has improved 4.6. Continue analysing data and making adjustments until desired level of process operation is achieved and product is within specifications in accordance with work instructions
5. Rectify problems	5.1. Identify the range of faults that can occur during the operation 5.2. Determine and rectify fault causes in accordance with established enterprise procedures 5.3. Identify and rectify equipment failure causes in accordance with established enterprise procedures 5.4. Make sure appropriate records and log books of equipment operations are maintained to meet enterprise requirements 5.5. Identify non-routine problems and report to designated person
6. Control hazards	6.1. Identify hazards from the job to be done 6.2. Identify other hazards in the work area 6.3. Assess the risks arising from those hazards 6.4. Implement measures to control those risks in line with procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Required skills include

- recognising process conditions which will lead to out of specification production and taking appropriate action
- 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 the melting equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- startup and shutdown processes
- construction and limitations of the melting equipment and conditions
- combustion 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
 - mechanical
 - electrical/instrument

Evidence 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 melting equipment be understood and that the importance of critical material properties, settings and readings is known.

Competence must be demonstrated in the ability to

EVIDENCE GUIDE

	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: • importance of critical material properties, settings and readings is identified • process and equipment are operated in accordance with work instructions and process parameters • temperatures are maintained within limits • melt quality is monitored to minimise wastage • start up and shut down occur first time • change in utilities (gas/power/diesel) is responded to immediately • signals and alarms are responded to immediately • process measurements and tests are continually made, observed and interpreted • melt quality is maintained to customer specifications. 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	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>MSAPMSUP292ASample and test materials and</i>

EVIDENCE GUIDE	
	<i>product.</i>
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
Melting equipment	This unit includes melting equipment applicable to each of the specific areas of glass products manufacture. These may include: • flat glass • insulation, glass wool insulation, laminated blankets, roll and boards • fibreglass and glass filaments • packaging, bottles and jars
Tools and equipment	Tools and equipment may include: • furnaces and associated equipment • gas stations • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Process and products	Process and products include: • melting, refining and conditioning of raw material, including frit and other recycled glass materials, to produce glass for forming

RANGE STATEMENT	
	processes It does NOT include processes involved with: • scientific glass • secondary processes • the softening of already made glass
Plant data	Plant data includes: • test results • instrument/control panel information • data from physical senses (sight, sound and hearing) • temperatures, pressures, material flow and discharge rates and effects • variations to chemical reactions/material modifications
Typical problems	Typical problems may include: • raw materials feed • alternative fuel sources • analysis of all plant data including test results, control instrument data and other observations • control of furnace temperature within specifications • surveillance of melt quality • taking corrective action
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		

PMC552041C Operate process ovens

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of furnaces used in annealing, conditioning, laminating, mirroring, toughening and glass reheating. It involves preparing equipment for production, operating and monitoring equipment operation and rectifying routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating process ovens. This unit does NOT apply to the operation of furnaces used for primary glass production and forming of glass products directly from the melting furnace which is covered by <i>PMC552040C Operate glass melting process</i>. This competency includes the operation of all ancillary equipment. It does NOT include processes involved with: • melting furnaces used in glass production • forming of glass products directly from a melting furnace. 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 the annealing/toughening/reheating/laminating equipment	1.1. Interpret job specifications 1.2. Isolate appropriate line/equipment 1.3. Undertake basic setup and removal of current moulds in accordance with manufacturer's and work instructions if required 1.4. Check that the quality and quantity of input glass is suitable for production run as per company requirements 1.5. Undertake equipment preparation and checks according to established procedures 1.6. Make machinery/equipment adjustments and final preparations to ensure that work instructions are met 1.7. Conduct product run/procedure to produce

ELEMENT	PERFORMANCE CRITERIA
	samples to confirm that quality meets specifications, if required
2. Anneal/toughen/reheat/laminate the products	2.1. Monitor equipment to ensure quality specifications are met 2.2. Identify routine variations to annealing/reheating process 2.3. Make routine operation adjustments according to established procedures to maintain product quality 2.4. Conduct product sampling and quality control checks according to standard procedures 2.5. Use ancillary equipment and observe safety procedures in accordance with enterprise requirements 2.6. Document and maintain records and production results according to enterprise requirements
3. Monitor and record reheating operation	3.1. Measure and record operating parameters, according to enterprise requirements 3.2. Adjust reheating equipment controls to ensure glass parameters are maintained to job specifications 3.3. Ensure appropriate records and log books of equipment operations are maintained to meet procedures
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures 4.3. Identify and rectify equipment failure causes in accordance with procedures 4.4. Identify non-routine problems and report to designated person
5. Control hazards	5.1. Identify hazards from the job to be done 5.2. Identify other hazards in the work area 5.3. Assess the risks arising from those hazards 5.4. Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production and taking appropriate action
- 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 the reheating equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- startup and shutdown processes
- construction and limitations of reheating equipment and conditions
- out of specification situations
- annealing/toughening/conditioning/mirror/laminating/reheating process set up, including identification of isolation points and entering new parameters into PLC
- temperature and temporary and permanent stress
- annealing and post-annealing processes
- toughening and post-toughening processes
- quality problems such as:
 - poor optics
 - excessive breakage
 - non-uniform break pattern
 - incorrect cross bend
 - excessive bow
 - scratches
 - poor glass shape
- distinguish between causes of faults such as:
 - raw material
 - mechanical
 - electrical/instrument

Evidence 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 reheating equipment be understood and that the importance of critical material properties, settings, parameters 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:

- temperatures and stress parameters are maintained within limits
- equipment setup is completed in accordance with work instructions including identification of isolation points, correct isolation of equipment and correct entering of new parameters
- startup and shutdown occurs first time
- signals and alarms are responded to immediately
- process measurements are continually made, observed and interpreted
- quality is maintained to customer specifications.

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

EVIDENCE GUIDE	
	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. It may be appropriate to assess this unit concurrently with: MSAPMSUP292A Sample and test materials and product. 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
Line equipment	Line equipment includes: - robots - load stations - lehr furnace - unloading, station conveyors
Equipment	This unit includes annealing/conditioning/reheating equipment applicable to each specific area of glass products manufacture. These may include:

RANGE STATEMENT	
	• packaging, bottles and jars • automotive glass • flat glass
Tools and equipment	Tools and equipment may include: • reheating equipment and associated equipment • toughening equipment • mirror and laminating equipment • annealing and associated equipment • gas stations • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Typical problems	Typical problems may include: • temperature and pressure problems • equipment problems • quality problems
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		

PMC552042C Operate blown insulation equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of blowing equipment used for manufacture of glass insulation. It involves preparing, operating and monitoring equipment, checking supply and quality of materials stocks, undertaking sampling and quality checks and rectifying routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for the operation and minor maintenance of glass blowing equipment. This competency includes the operation of all ancillary equipment. 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 formation equipment	1.1. Interpret job specifications and set up the appropriate line/ equipment 1.2. Check materials stocks for quality and quantity suitable for production run 1.3. Undertake equipment preparation and checks according to established procedures 1.4. Conduct initial product run/procedure to produce samples to confirm that quality meets specifications 1.5. Make machinery/equipment adjustments and final preparations to ensure that job specifications are met
2. Form the products	2.1. Start forming process line and monitor equipment to ensure that quality specifications are met 2.2. Monitor operating parameters according to procedures 2.3. Make operation adjustments according to established procedures to maintain product quality 2.4. Conduct product sampling and quality control checks according to standard procedures to ensure and maintain the forming specifications 2.5. Use and observe ancillary equipment and safety procedures in accordance with enterprise

ELEMENT	PERFORMANCE CRITERIA
	requirements 2.6.Document and maintain records and production results according to enterprise requirements 2.7.Identify processing problems and report to a designated person for rectification
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 3.3.Identify and rectify equipment failure causes in accordance with procedures 3.4.Ensure 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. Control hazards	4.1.Identify hazards from the job to be done 4.2.Identify other hazards in the work area 4.3.Assess the risks arising from those hazards 4.4.Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production
- 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 the process and equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge includes:

- composition and nature of the glass
- startup and shutdown processes
- construction and limitations of the equipment
- out of specification situations
- importance of safety procedures and personal protective equipment (PPE)
- quality problems which may include:
 - broken packs
 - mixed and damaged material
 - binder delivery
 - blocked spinners/spray rings
 - poor glass quality
- distinguish between causes of faults such as:
 - raw materials
 - equipment
 - types of defects/faults
 - electrical/instrumental/mechanical

Evidence 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 reheating equipment be understood and that the importance of critical material properties, settings, parameters 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:

EVIDENCE GUIDE	
	• equipment setup is completed in accordance with work instructions and manufacturer's specifications • startup and shutdown occur first time • signals and alarms are responded to immediately • process measurements are continually made, observed and interpreted • operating supply levels are maintained • equipment problems are identified and responded to immediately • quality is maintained to customer specifications. 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	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

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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 operations	This unit includes the operation of insulation forming equipment, such as: - forming and ancillary equipment which may include: - spinners - fiberisers - bushings - lapping equipment - communication equipment - measuring equipment - hand tools - safety clothing and equipment
Typical problems	Typical problems may include: - temperature and pressure problems - equipment problems - quality problems
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		

PMC552043C Operate float forming equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of float forming equipment used for the manufacture of sheet glass. It involves setting up and tuning the process, operating and maintaining equipment, undertaking routine checks, rectifying routine problems and completing documentation.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating float forming equipment within the manufactured mineral products industry. This competency includes the operation of all ancillary equipment. 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	

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 formation equipment	1.1. Interpret job specifications and set up the appropriate line/equipment 1.2. Set quality and quantity of molten glass conditions to be consistent with production program requirements 1.3. Undertake equipment preparation and checks according to established procedures
2. Fine tune forming processes	2.1. Conduct pre-run checks according to equipment procedures 2.2. Make machinery/equipment adjustments and final preparations to ensure that work instructions are met 2.3. Confirm that quality meets specifications
3. Form the products	3.1. Monitor equipment to ensure that quality specifications are met 3.2. Make operation adjustments according to established procedures to maintain product quality 3.3. Conduct product sampling and quality control checks

ELEMENT	PERFORMANCE CRITERIA
	according to standard procedures 3.4. Use and monitor ancillary equipment and safety procedures in accordance with enterprise requirements 3.5. Maintain records according to enterprise requirements
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures 4.3. Identify and rectify equipment failure causes in accordance with procedures 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures 4.5. Identify non-routine problems and report to designated person
5. Control hazards.	5.1. Identify hazards from the job to be done 5.2. Identify other hazards in the work area 5.3. Assess the risks arising from those hazards 5.4. Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production and taking appropriate action
- implement 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 the forming equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge includes:

- composition and nature of the glass
- setup/changeover of equipment
- startup and shutdown processes
- construction and limitations of the equipment
- out of specification situations
- quality problems include:
 - poor optics
 - excessive breakage
 - non-uniform break pattern
 - excessive bow
 - scratches
 - poor glass shape
- distinguish between causes of faults such as:
 - raw materials
 - equipment
 - types of defects/faults
 - electrical/instrumental

Evidence 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 reheating equipment be understood and that the importance of critical material properties, settings, parameters 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:

EVIDENCE GUIDE	
	- temperatures are maintained within limits - startup and shutdown occur first time - signals and alarms are responded to immediately - process measurements are continually made, observed and interpreted - quality is maintained to customer specifications.
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. 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.

RANGE STATEMENT	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Equipment	Equipment may include: • bath • ancillary equipment • computers • measuring recording equipment • communication equipment • hand tools • safety clothing and equipment
Typical problems	Typical problems may include: • temperature and pressure problems • equipment problems • quality problems • loss of ribbon
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		

PMC552044C Operate fibre forming equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of fibre forming/ extrusion equipment used for the manufacture of glass fibres. It involves preparing formation equipment for production, operating and monitoring equipment, undertaking sampling and quality checks, rectifying routine problems and undertaking minor maintenance.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating, monitoring and maintaining float forming equipment within the manufactured mineral products industry. This competency includes the operation of all ancillary equipment. 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	

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 forming equipment	1.1. Interpret job specifications and set up the appropriate equipment in accordance with work instructions 1.2. Check materials stocks for quality and quantity suitable for production 1.3. Prepare all consumables for production 1.4. Undertake equipment preparation and checks according to established procedures
2. Operate forming equipment	2.1. Start up equipment in accordance with work instructions 2.2. Form glass by directing product flow in accordance with work instructions and safety requirements 2.3. Ensure forming processing equipment is operated in accordance with established enterprise procedures
3. Monitor and record forming equipment	3.1. Monitor equipment to ensure that quality

ELEMENT	PERFORMANCE CRITERIA
operation	specifications are met 3.2. Make operation adjustments according to established procedures to maintain product quality 3.3. Conduct product sampling and quality control checks according to enterprise procedures to maintain forming specifications 3.4. Monitor application of size over glass fibres to ensure quality specifications are met 3.5. Use and observe ancillary equipment and safety procedures in accordance with enterprise requirements 3.6. Document and maintain records and production results according to enterprise requirements 3.7. Identify and report processing problems to a designated person for rectification
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures 4.3. Identify and rectify equipment failure causes in accordance with procedures 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures 4.5. Identify non-routine problems and report to designated person
5. Control hazards	5.1. Identify hazards from the job to be done 5.2. Identify other hazards in the work area 5.3. Assess the risks arising from those hazards 5.4. Implement measures to control those risks in line with procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Required skills include:

- recognising process conditions which will lead to out of specification production
- 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 the process and equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- startup and shutdown processes
- construction and limitations of the equipment
- out of specification situations
- importance of safety procedures and personal protective equipment (PPE)
- quality problems which may include:
 - broken packs
 - mixed and damaged material
 - double winding
 - forming positions
 - break and stoppages
 - poor glass quality
- distinguish between causes of faults such as:
 - raw materials
 - equipment
 - types of defects/faults
 - electrical/instrumental

Evidence 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.

EVIDENCE GUIDE	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	It is essential that the equipment and operating parameters 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: • equipment setup is completed in accordance with work instructions • signals and alarms are responded to immediately • process measurements are continually made, observed and interpreted • operating supply levels are maintained • equipment problems are identified and responded to immediately • quality is maintained to customer specifications. 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	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 processes and techniques must be culturally appropriate and appropriate to the language and literacy

EVIDENCE GUIDE**assessment**

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

Equipment may include:

- forming equipment
- size application equipment
- communication equipment
- hand tools
- safety clothing and equipment

Typical problems

Typical problems may include:

- winding and sliver problems
- equipment problems including condition and cleaning of equipment
- quality problems

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		

PMC552045C Operate container forming equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of forming equipment used for the manufacture of glass containers (e.g. bottles and jars). It involves checking line setup, checking quality and supply of raw materials, monitoring and fine tuning the process and rectifying routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating container forming equipment within the manufactured mineral products industry. This unit does NOT apply to the operation of furnaces used for primary glass production or the forming of glass products directly from the melting furnace, which is covered by <i>PMC552040C Operate glass melting process</i>. This competency includes the operation of all ancillary equipment. It does NOT include melting, furnace or raw materials, annealing lehr and packing and handling. 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 formation equipment	1.1. Interpret job specifications and check the appropriate line/equipment is setup correctly 1.2. Ensure glass feed is at the correct temperature 1.3. Check that production aids and materials are suitable and available for production run 1.4. Undertake equipment preparation and checks according to procedures
2. Fine tune forming processes	2.1. Conduct checks according to equipment procedures 2.2. Make machinery and equipment adjustments to ensure that job specifications are met
3. Form the products	3.1. Monitor equipment to ensure that quality specifications are met 3.2. Make operation adjustments according to procedures

ELEMENT	PERFORMANCE CRITERIA
	to maintain product quality 3.3. Conduct product sampling and quality control checks according to procedures to ensure and maintain the forming specifications 3.4. Use and observe ancillary equipment and safety procedures in accordance with enterprise requirements 3.5. Document and maintain records and production results according to procedures 3.6. Identify processing problems and report to a designated person for rectification
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures 4.3. Identify and rectify equipment failure causes in accordance with procedures 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures 4.5. Identify non-routine problems and report to designated person
5. Control hazards	5.1. Identify hazards from the job to be done 5.2. Identify other hazards in the work area 5.3. Assess the risks arising from those hazards 5.4. Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production
- implementing the enterprise's standard procedures and work instructions and relevant regulatory requirements within appropriate time constraints and in a

REQUIRED SKILLS AND KNOWLEDGE

- manner relevant to the operation of the equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- basics of glass
- independent section (IS) machine and mould operation
- forming processes (blow and blow, press and blow, narrow neck press and blow)
- swabbing
- inspection, quality procedures and records
- distinguish between causes of faults such as:
 - heat and temperature
 - dies and forming
 - other equipment faults

Evidence 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 be understood and that the importance of critical material properties and settings 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:

- production rates are acceptable
- product meets specification
- procedures are carried out to requirements and timing (e.g. swabbing)
- work area meets occupational cleanliness and

EVIDENCE GUIDE	
	hygiene standards. 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	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. This unit may be assessed in conjunction with: • <i>MSAPMOPS212A Use enterprise computers or data systems.</i> 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

RANGE STATEMENT	
regional contexts) may also be included.	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Equipment	Equipment may include: • fore hearth • feeders and delivery • independent section (IS) forming machines • ware handling equipment (e.g. conveyors) • hot end inspection equipment
Typical problems	Typical problems may include: • container weight off specification • container sizes not meeting specification • equipment breakdown
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	

Co-requisite units		

PMC552046C Operate glass printing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation and operation of glass printing equipment. It involves setting up printing equipment, cleaning and maintaining print screens, monitoring glass throughput and quality, undertaking routine checks and rectifying routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for preparing and operating glass printing equipment within the manufactured mineral products industry. This competency includes the operation of all ancillary equipment. 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	

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 the printing equipment for production	1.1. Set up line in accordance with job specifications 1.2. Transfer glass to conveyor 1.3. Conduct pre-startup procedure and visual checks according to enterprise procedure checklist 1.4. Set up and configure printing equipment to ensure startup function complies with standard operating procedures 1.5. Load and separate glass in accordance with work instructions
2. Operate printing equipment	2.1. Identify customer requirements and set minimum parameters in accordance with batch sheets 2.2. Start up equipment in accordance with work instructions 2.3. Ensure glass printing equipment is operated in accordance with established enterprise procedures

ELEMENT	PERFORMANCE CRITERIA
3. Monitor and record printing equipment operation	3.1. Monitor equipment performance in accordance with work instructions and manufacturer's specifications 3.2. Monitor non-conforming product against customer specifications 3.3. Adjust and control equipment to ensure correct product quality in accordance with company requirements 3.4. Complete final inspection checks 3.5. Complete appropriate records and logs
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures 4.3. Identify and rectify equipment failure causes in accordance with procedures 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures 4.5. Identify non-routine problems and report to designated person
5. Shut down equipment	5.1. Ensure line is clear of all product and left in a safe manner for shutdown 5.2. Shut down equipment in accordance with work instructions 5.3. Complete appropriate records and logs 5.4. Shut down equipment in an emergency situation
6. Prepare equipment for maintenance	6.1. Isolate equipment in accordance with work instructions 6.2. Remove any broken glass safely 6.3. Make sure area is clear and safe for maintenance
7. Control hazards	7.1. Identify hazards from the job to be done 7.2. Identify other hazards in the work area 7.3. Assess the risks arising from those hazards 7.4. Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production
- 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 the finishing equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- startup and shutdown processes
- importance of occupational health and safety (OHS) procedures in handling glass
- construction and limitations of the glass printing and edgework processing equipment
- out of specification situations
- distinguish between causes of faults such as:
 - raw materials
 - equipment
 - types of defects/faults
 - electrical/instrumental

Evidence 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

It is essential that the printing equipment be understood and that the importance of critical material properties,

EVIDENCE GUIDE	
competency in this unit	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: • quality is monitored to minimise wastage • products are produced within specifications and customer requirements • startup and shutdown occur first time • signals and alarms are responded to immediately • process measurements are continually made or observed • all OHS requirements are followed. 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	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 or 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
Finishing equipment	This unit includes finishing equipment applicable to each of the specific areas of glass products manufacture: • flat glass • automotive glass
Equipment	Equipment may include: • printing and edgework equipment • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Typical problems	Typical problems may include: • process problems • equipment problems • quality problems
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		

PMC552047C Operate primary annealing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation and operation of annealing equipment in the forming of glass products from a melting furnace. It involves setting up and tuning the process, monitoring ribbon quality, dimensions and temperature, undertaking routine checks and rectifying routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating and maintaining primary annealing equipment within the manufactured mineral products industry. This unit does NOT include secondary processes involved in reheating of glass for laminating or toughening processes, which are covered by <i>PMC552041C Operate process ovens</i>. This competency includes the operation of all ancillary equipment. 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 the annealing equipment	1.1. Identify the location and function of annealing equipment 1.2. Interpret job specifications and set up the appropriate line/equipment 1.3. Check that the quality and quantity of input glass is suitable for production run as per company requirements 1.4. Undertake equipment preparation and prestart checks according to established procedures. 1.5. Undertake pre-startup checks in accordance with procedures
2. Start up and shut down annealing equipment	2.1. Complete the steps for setting up and preparing to start annealing equipment in normal and abnormal situations

ELEMENT	PERFORMANCE CRITERIA
	2.2. Complete the steps preparing for shutting down annealing equipment in normal and abnormal situations 2.3. Start up the annealing equipment as required 2.4. Shut down the annealing equipment as required
3. Operate annealing equipment	3.1. Operate annealing equipment to ensure quality specifications are met 3.2. Make operation adjustments according to established procedures and ensure product quality and specifications are maintained 3.3. Use and observe ancillary equipment and safety procedures in accordance with enterprise requirements 3.4. Document and maintain records and production results according to enterprise requirements
4. Monitor, adjust and record annealing operation	4.1. Monitor equipment operation to maintain product quality and specifications 4.2. Measure and record operating parameters according to enterprise requirements 4.3. Conduct product sampling and quality control checks according to standard procedures to ensure and maintain annealing specifications 4.4. Adjust annealing equipment controls to ensure glass parameters are maintained to job specifications 4.5. Record results in accordance with work instructions
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 5.3. Identify and rectify equipment failure causes in accordance with procedures 5.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures 5.5. Identify non-routine problems and report to designated person
6. Control hazards.	6.1. Identify hazards from the job to be done 6.2. Identify other hazards in the work area 6.3. Assess the risks arising from those hazards 6.4. Implement measures to control those risks in line

ELEMENT	PERFORMANCE CRITERIA
	with 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 process conditions which will lead to out of specification production
- 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 the process and equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- startup and shutdown processes
- setup and annealing/conditioning process
- temperature and temporary and permanent stress
- pre-annealing, annealing and post-annealing processes
- construction and limitations of the reheating equipment
- out of specification situations
- quality problems such as:
 - poor optics
 - distortion
 - excessive breakage
 - non-uniform break pattern
 - incorrect cross bend
 - excessive bow
 - scratches
 - poor glass shape
- distinguish between causes of faults such as:
 - raw materials/ribbon faults
 - equipment

REQUIRED SKILLS AND KNOWLEDGE

- types of defects/faults
- electrical/instrumental

Evidence 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 reheating 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:

- temperatures and stress parameters are maintained within limits
- equipment set up is completed in accordance with work instructions
- startup and shutdown occur first time
- signals and alarms are responded to immediately
- process measurements are continually made, observed and interpreted
- quality is maintained to customer specifications.

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

EVIDENCE GUIDE	
	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. Individual enterprises may choose to add prerequisites or co-requisite units 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
Finishing equipment	This unit includes finishing equipment applicable to each of the specific areas of glass products manufacture, including: - flat glass - packaging, bottles and jars
Equipment	Equipment may include: - lehr and associated equipment - gas burners

RANGE STATEMENT	
	• instrumentation • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Typical problems	Typical problems may include: • process problems • equipment problems • quality problems • temperature and strain problems • equipment problems • quality problems • loss of utilities
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	

Co-requisite units		

PMC552048C Operate glass finishing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation and operation of glass finishing equipment. It involves setting up and monitoring process operation, undertaking changeovers, making adjustments and rectifying routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating glass finishing equipment. This unit of competency was developed for larger production contexts but may also be relevant to craft practitioners producing glass products. This competency includes the operation of all ancillary equipment. 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	

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 the glass finishing equipment for production	1.1. Set up line/equipment in accordance with job specifications 1.2. Transfer glass to conveyor 1.3. Conduct pre-startup procedure and visual checks according to enterprise procedure checklist 1.4. Set up and configure finishing equipment/materials to ensure startup function complies with standard operating procedures 1.5. Load and separate glass in accordance with work instructions
2. Operate glass finishing equipment	2.1. Identify customer requirements and set minimum parameters in accordance with enterprise standards 2.2. Start up equipment in accordance with work instructions 2.3. Ensure glass finishing equipment is operated in

ELEMENT	PERFORMANCE CRITERIA
	accordance with established enterprise procedures/work instructions
3. Monitor and record glass finishing equipment operation	3.1. Monitor equipment performance in accordance with work instructions and manufacturer's specifications 3.2. Monitor non-conforming product against customer specifications 3.3. Adjust and control equipment/material to ensure correct product quality in accordance with company requirements 3.4. Complete final inspection checks according to enterprise standards 3.5. Complete appropriate records and logs according to enterprise standards
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures 4.3. Identify and rectify equipment failure causes in accordance with procedures 4.4. Make sure appropriate records and log books of equipment operations are maintained to meet procedures 4.5. Identify non-routine problems and report to designated person
5. Shut down equipment	5.1. Ensure line/equipment is clear of all product and left in a safe manner for startup 5.2. Shut down equipment in accordance with work instructions 5.3. Complete appropriate records and logs 5.4. Shut down equipment in an emergency situation
6. Control hazards	6.1. Identify hazards from the job to be done 6.2. Identify other hazards in the work area 6.3. Assess the risks arising from those hazards 6.4. Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production
- 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 the finishing equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- start up and shut down processes
- importance of occupational health and safety (OHS) procedures in handling glass
- construction and limitations of the glass finishing processing equipment
- out of specification situations
- distinguish between causes of faults such as:
 - raw material
 - mechanical
 - electrical/instrument

Evidence 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 glass finishing 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

EVIDENCE GUIDE	
	analyse potential situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • quality is monitored to minimise wastage • products are produced within specifications and customer requirements • startup and shutdown are correctly implemented • signals and alarms are responded to immediately • process measurements are continually made or observed • all OHS requirements are followed. 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	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 or co-requisite units 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
Finishing equipment	This unit includes finishing equipment applicable to each of the specific areas of glass products manufacture. These may include: • flat glass • insulation, glass wool insulation, laminated blankets, roll and boards • fibreglass and glass filaments • packaging, bottles and jars • laminated/toughened glass • automotive glass
Equipment	Equipment may include: • cutting/breakout and drilling • trimming and packing • lathes • etching/surface coating/ treatment equipment • wide line equipment • laminating line equipment • rigid pipeline • measuring recording equipment • choppers • winding machines • ovens • edge working machinery • creel • on-line cutting • communication equipment • computers
Typical problems	Typical problems may include: • process problems

RANGE STATEMENT	
	• equipment problems • quality problems
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		

PMC552049C Operate on-line stacking and assembly equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation and operation of glass finishing equipment for on-line stacking and assembly. It involves setting up equipment for production process, monitoring glass quality, assembling glass, conducting routine checks and rectifying routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating on-line stacking and assembly equipment. It does NOT include processes involved with melting furnaces used in glass production (primary or secondary sources), which are covered by <i>PMC552040C Operate glass melting process</i> or <i>PMC552041C Operate process ovens</i>. This competency includes the operation of all ancillary equipment. 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 the flat glass processing equipment for production	1.1. Set up line in accordance with job specifications 1.2. Transfer glass to conveyor 1.3. Conduct flat glass processing equipment pre-startup procedure and visual checks according to enterprise procedure checklist 1.4. Set up and configure flat glass processing equipment to ensure startup function complies with standard operating procedures 1.5. Load and separate glass in accordance with work instructions
2. Operate flat glass processing equipment	2.1. Identify customer requirements and set minimum parameters in accordance with batch sheets 2.2. Start up equipment in accordance with work

ELEMENT	PERFORMANCE CRITERIA
	instructions 2.3. Ensure flat glass processing equipment is operated in accordance with established enterprise procedures.
3. Monitor, adjust and record flat glass processing equipment operation	3.1. Monitor equipment performance in accordance with work instructions and manufacturer's specifications 3.2. Monitor non-conforming product against customer specifications 3.3. Adjust and control equipment to ensure correct product quality 3.4. Complete final inspection checks 3.5. Complete appropriate records and logs
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures 4.3. Identify and rectify equipment failure causes in accordance with procedures 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures 4.5. Identify non-routine problems and report to designated person
5. Shut down equipment	5.1. Ensure line is clear of all product and left in a safe manner for start up 5.2. Shut down equipment in accordance with work instructions 5.3. Complete appropriate records and logs 5.4. Shut down equipment in an emergency situation
6. Prepare equipment for maintenance	6.1. Isolate equipment in accordance with work instructions 6.2. Remove any broken glass safely 6.3. Make sure area is clear and safe for maintenance
7. Control hazards	7.1. Identify hazards from the job to be done 7.2. Identify other hazards in the work area 7.3. Assess the risks arising from those hazards 7.4. Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production
- 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 the flat glass processing equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- startup and shutdown processes
- construction and limitations of the flat glass processing equipment
- out of specification situations
- distinguish between causes of faults such as:
 - raw material
 - mechanical
 - electrical/instrument

Evidence 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 flat glass processing 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

EVIDENCE GUIDE	
	implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • temperatures are maintained within limits • quality is monitored to minimise wastage • products are produced within specifications and customer requirements • startup and shutdown occur first time • signals and alarms are responded to immediately • process measurements are continually made or observed • all OHS requirements are followed. 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	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	All operations are performed in accordance with standard procedures and work instructions
Glass processing equipment	Glass processing equipment applicable to on-line cutting, laminating, toughening or mirror formed glass for each specific area of glass products manufacture include: • flat glass • laminated glass assembly equipment • automotive glass
Tools and equipment	Tools and equipment may include: • flat glass processing equipment and associated equipment • glass assembly equipment • on-line stacking equipment • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment It does NOT include processes involved with: • melting furnaces used in glass production (primary source) • furnaces used in reheating (secondary source) • scientific glass equipment making
Typical problems	Typical problems may include: • glass jamming or kicking sideways • temperature problems • quality problems including scars, moisture content, shelling, venting, curing and thickness in accordance with customer specifications

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	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC552050C Schedule, cut and bend reinforcement

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the interpretation of plans (steel drawings) and the cutting, bending and testing of reinforcing steel for manufactured concrete products. It involves determining job requirements, choosing the necessary tools and materials and ensuring testing is conducted effectively.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for preparing reinforcement for use in a variety of manufactured concrete products. This unit includes: • bars and mesh • bars and mesh prepared by reinforcement supplier • validation of test certificates • cropping and guillotining of bar and mesh • bending and other preparation of reinforcement ready for assembly • using automatic and semi-automatic reinforcement machines • the operation of all ancillary equipment. This competency is typically performed by operators working either independently or as part of a work team. Individual enterprises may choose to add prerequisites and co-requisites relevant to their 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. Interpret plan/steel drawing/specifications	1.1. Recognise steel sizes and types required 1.2. Interpret steel dimensions 1.3. Check cover to steel is adequate and report if not 1.4. Determine steel lengths allowing for bends and bar thickness 1.5. Follow instructions/requirements for cage assembly
2. Prepare materials and equipment	2.1. Determine requirements prior to fabricating 2.2. Read job specification/plan and determine equipment and material requirements

ELEMENT	PERFORMANCE CRITERIA
	2.3. Check availability of bars and mesh 2.4. Set up templates and equipment in compliance with plan/specifications and work instructions 2.5. Cut, bend and tag reinforcement
3. Organise quality testing of reinforcement	3.1. Arrange for samples of work in progress to be verification tested if specified 3.2. Check reinforcement using go no-go gauges, dimension tolerance, cosmetics and level of standards specification 3.3. Implement test requirements in accordance with standard operating procedures and any legislative or regulatory requirements
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures/work instructions 4.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 4.4. Make sure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 4.5. Identify non-routine problems and report to designated person
5. Control hazards	5.1. Identify hazards from the job to be done 5.2. Identify other hazards in the work area 5.3. Assess the risks arising from those hazards 5.4. Implement measures to control those risks in line with 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 problems and taking appropriate action

REQUIRED SKILLS AND KNOWLEDGE

- implementing enterprise's standard procedures and work instructions and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the fabrication of reinforcement
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- relevant quality tests
- interpret plans (steel drawings, reinforcement schedules) and specifications
- reinforcement design drawings
- reinforcement schedules
- reinforcement tags
- make necessary calculations from 'steel drawings'
- choose appropriate bending pin and bending machine setup
- predict final shape/dimension based on bar size/type, bend radius and anchorage requirement
- underlying causes of faults such as precipitated by:
 - reinforcing
 - design
 - fabrication
 - 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

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 fabrication process be understood and that the importance of critical material properties, specifications and dimensions is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

EVIDENCE GUIDE	
	Consistent performance should be demonstrated. In particular look to see that: • allowance is made for fittings and lifting lugs to be correctly positioned • steel coverage is adequate • dimensions/dimensional tolerance are correct • appropriate grade of steel is used. 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

RANGE STATEMENT	
regional contexts) may also be included.	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Typical problems	Typical problems may include: • dimensions and positions of fittings and lugs as they affect reinforcement dimension and shape • adequate cover of steel • predicting final size and shape of bent bar reinforcement • rectifying design and scheduling errors that may not be obvious until items are assembled
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		

Co-requisite units		

PMC552051C Finish green concrete products

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the process of finishing green concrete products. It involves preparing and finishing surfaces and identifying and resolving process malfunctions.

Application of the Unit

Application of the unit	This unit of competency applies to operators in a concrete plant who are responsible for finishing green manufactured concrete products before they have been cured. The unit covers all finishes applied to concrete before curing (e.g. exposed aggregate) and assumes that all manufacturing operations up to final vibration and/or screeding the top surface flat have been covered by other units of competency. This unit includes: • operation of concrete mixers • measuring of ingredients and additives • interpretation of formulae/mixing specifications • matching concrete to specification • finishing concrete to match samples • spraying concrete to make exposed aggregate • applying sealers and curing compounds to wet concrete • the operation of all ancillary equipment. This competency is typically performed by operators working either independently or as part of a work 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 surface finish green concrete	1.1. Check drawings and work orders for finish requirements 1.2. Check product against relevant specification 1.3. Check required condition and set state of concrete 1.4. Prepare/mix surface finish as required 1.5. Prepare finish equipment
2. Finish surface green concrete as required	2.1. Apply finish/spray surface in accordance with procedures 2.2. Inspect surface after initial finishing and

ELEMENT	PERFORMANCE CRITERIA
	patch/rework as required 2.3. Continue finishing/monitor finish as appropriate 2.4. Inspect final finish after appropriate time and make any changes required to meet specification 2.5. Dispose of waste to requirements
3. Rectify routine problems	3.1. Identify the range of faults that can occur during the operation 3.2. Determine and rectify fault causes in accordance with 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 from the job to be done 4.2. Identify other hazards in the work area 4.3. Assess the risks arising from those hazards 4.4. Implement measures to control those risks in line with 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 conducting of operations
- conveying information relevant to the operation clearly and effectively
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

REQUIRED SKILLS AND KNOWLEDGE

- principles of concrete mixing (if mixed by operator)
- principles of veneer adhesion
- principles of concrete finishing
- distinguish between causes of faults such as:
 - material inconsistencies
 - mixing irregularities
 - application
 - finishing difficulties

Evidence 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 process be understood and that the importance of critical material properties, mixing variables and surface finishing techniques 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:

- surface finish matches specification and is consistent
- coverage is adequate and consistent
- sealer coverage is adequate and consistent.

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.

EVIDENCE GUIDE	
	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. 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
Surface finishes	Surface finishes may include: • fine wood float • rough wood float • hand steel float • broomed • helicopter steel float • raked finish

RANGE STATEMENT	
	Surface finishes may be applied before or after veneering Surface finish after veneering may then also require further finish after curing
Typical problems	Typical problems may include: • off colour batches • bleeding between concrete mixes • consistency of veneer and cover • consistency of spray pattern • adequacy and consistency of surface finish • wet patching of surface finish
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		

PMC552052C Cast moulded concrete products

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the casting of complex concrete product moulds. It involves preparing the mould for reinforcement, selecting the necessary tools and equipment, ensuring reinforcing and fittings are correctly placed and ensuring finished product is to specification.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for casting complex concrete moulds for use in the production of concrete products. This unit includes: • timber, glass fibre, metal casing, latex rubber, plaster and other moulds • use of hand tools as required • interpretation of production schedules/work cards as appropriate • interpreting plans or specifications • placement of reinforcing and accessories • placement and stressing of strands • compaction using vibrating tables and immersion vibrators as appropriate to the enterprise • the operation of all ancillary equipment. This competency is typically performed by operators working either independently or as part of a work 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. Set up mould and accessories	1.1. Fit reinforcement and fittings according to work instructions 1.2. Pre-stress reinforcement as required 1.3. Strap pipes/accessories down as required 1.4. Inspect mould assembly is to specification 1.5. Check mould for defects and correct if required
2. Prepare equipment for the mix	2.1. Set up tools required 2.2. Set up vibrators to standard 2.3. Ensure concrete dispenser is in action

ELEMENT	PERFORMANCE CRITERIA
	2.4.Ensure mix is to standard consistency
3. Cast concrete into moulds	3.1.Check casting schedule, job specification and drawings 3.2.Clean, seal and oil moulds as required 3.3.Pour mix into mould at correct speed 3.4.Vibrate according to standard operating procedures 3.5.Finish and cover mould as required 3.6.Clean mould and work site as required by good occupational hygiene practices
4. Rectify routine problems	4.1.Identify the range of faults that can occur during the operation 4.2.Determine and rectify fault causes in accordance with procedures/work instructions 4.3.Identify and rectify equipment failure causes in accordance with procedures/work instructions 4.4.Make sure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 4.5.Identify non-routine problems and report to designated person
5. Control hazards	5.1.Identify hazards from the job to be done 5.2.Identify other hazards in the work area 5.3.Assess the risks arising from those hazards 5.4.Implement measures to control those risks in line with 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 and taking appropriate action
- implementing the enterprise's procedures within time constraints and in a manner relevant to the correct use of the equipment and placement of reinforcing

REQUIRED SKILLS AND KNOWLEDGE

- 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:

- causes of mould wear
- results of using worn moulds
- problems resulting from mould leakage
- importance of vibration on compaction
- required concrete cover of reinforcing
- hazards from pre-stressed reinforcement
- underlying causes of faults such as precipitated by:
 - mould anomalies
 - casting/operating conditions
 - concrete mix variations
 - vibration

Evidence 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 be understood and that the importance of critical mould properties and dimensions 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:

- moulds are withdrawn for repair as required
- moulds drawn from the mould store are in good order

EVIDENCE GUIDE	
	• stocks of spares are kept at appropriate levels • correct moulds are available for required jobs • product is cast with correct amount and grade of concrete • product is vibrated to give a consistent product without air holes • products are made consistently in minimum time and with minimum patching • finishing is within specifications • good OHS practice is used consistently. 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

RANGE STATEMENT	
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
Accessories	Accessories may include: • pipes/tubing • hooks • cones
Typical problems	Typical problems may include: • interpretation of drawings and matching reinforcement and moulds to drawing • slippage, breaking of tensioned strands • compacting product and tight bends/clearances • wear and tear on mould parts • loose or missing bolts • bolt holes • stretched rubber • moulds coming apart
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		

PMC552053C Finish cured concrete products

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the finishing of cured concrete products. It involves checking and preparing surfaces, finishing surfaces, cleaning and sealing surfaces and identifying and resolving process malfunctions.

Application of the Unit

Application of the unit	This unit of competency applies to operators in a concrete plant who are responsible for finishing manufactured concrete products after they have been cured. This unit includes, but is not restricted to: • all finishes applied to concrete after curing such as: • blasting • honing • polishing • etching • sealing • painting • grit and sand blasting • graffiti treatments • sprayed finishes on cured concrete • acid etching • routine housekeeping and maintenance of equipment and area • the operation of all ancillary equipment. This competency is typically performed by operators working either independently or as part of a work 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. Check product prior to finishing	1.1.Check product identity and finish required 1.2.Check product has been cured and is ready for finishing 1.3.Check type and size of aggregate and any special characteristics of concrete mix 1.4.Check for handling and other damage and report if necessary 1.5.Set up finishing process as required
2. Undertake initial	2.1.Perform initial finishing over product surface

ELEMENT	PERFORMANCE CRITERIA
finishing as required	2.2.Check for consistency, flatness and that other requirements have been met 2.3.Report products which are outside specification or which may not be able to be correctly finished
3. Finish surface as required	3.1.Adjust finishing process as required 3.2.Monitor progress of finishing and readjust as required 3.3.Continue finishing until surface meets specification
4. Clean and seal coat as required	4.1.Clean finished surface as required 4.2.Apply sealer coat as required 4.3.Monitor and adjust sealer coating thickness against relevant specification 4.4.Lift unit into store in accordance with occupational health and safety (OHS) requirements and support on protective pads
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. Control hazards	6.1.Identify hazards from the job to be done 6.2.Identify other hazards in the work area 6.3.Assess the risks arising from those hazards 6.4.Implement measures to control those risks in line with procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Required skills include:

- recognising conditions which will lead to variations to the finishing process and taking appropriate action
- implementing the enterprise's procedures within time constraints and in a manner relevant to the operation of the equipment used
- conveying information relevant to the operation clearly and effectively
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- principles of concrete product formation
- principles of concrete finishing
- distinguish between causes of faults such as:
 - material inconsistencies
 - product variation
 - finishing difficulties
 - handling difficulties

Evidence 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 process be understood and that the importance of critical material properties and surface finishing techniques 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:

- surface finish matches specification and is consistent

EVIDENCE GUIDE	
	- progress is continuously monitored and final finish is approached smoothly and confidently - finished surface is cleaned and sealed as required. 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**OHS**

The identification and control of hazards and the application of OHS 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**

PMC552054C Spin concrete pipes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of pipe spinning equipment and the production of spun concrete pipes. It involves ensuring the mould is correctly assembled, loading and operating equipment correctly, monitoring the process and removing and inspecting the product.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for spinning concrete pipes of various sizes in a concrete plant. It includes the operation of all ancillary equipment. This competency is typically performed by operators working either independently or as part of a work 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. Assemble and prepare the pipe mould	1.1. Check mould for distortion, cracks or other defects 1.2. Clean mould cavity and apply stripping agent 1.3. Check and insert reinforcing cage and/or other fitments and secure in accordance with procedures/work instructions 1.4. Check cover to steel and fix or report as appropriate 1.5. Check holding of cage 1.6. Assemble mould and secure in accordance with procedures/work instructions 1.7. Move pipe mould to spinning equipment
2. Load mould onto pipe spinning equipment	2.1. Load pipe mould onto spinning equipment 2.2. Check that mould is stabilised and correctly mounted on rollers 2.3. Make adjustments to equipment settings to ensure conformance with procedures/work instructions 2.4. Notify appropriate personnel of intention to start spinning equipment
3. Spin pipe	3.1. Conduct additional pre-start checks as required in accordance with procedures/work instructions 3.2. Ensure an adequate supply of the specified concrete mix is available to meet production requirements 3.3. Start spinning equipment in accordance with

ELEMENT	PERFORMANCE CRITERIA
	procedures/work instructions 3.4. Monitor instrument/control panels and adjust rate of spin and material flow as necessary to remain within specified operating parameters 3.5. Make observations of plant and equipment at specified intervals to identify any anomalies in procedures/work instructions 3.6. Maximise product throughput and efficiency to maintain target parameters 3.7. Communicate with appropriate personnel regarding the status of operations in line with enterprise requirements 3.8. Employ safe working practices which conform to occupational health and safety (OHS) and enterprise requirements
4. Finish and cure pipe	4.1. Float/finish pipes as required 4.2. Remove spun pipe and mould from spinning equipment 4.3. Inspect inside diameter of pipe, ends and inside surface finish 4.4. Undertake any repairs to pipe caused by irregularities in material flow 4.5. Move pipe to curing tunnel or kiln in accordance with procedures/work instructions 4.6. Monitor curing of pipe to ensure compliance with enterprise quality requirements 4.7. Remove pipe and mould from curing equipment
5. Demould pipe	5.1. Remove any separators, non-permanent inserts, plugs or blinds 5.2. Disassemble mould and release pipe in accordance with safe working practice and procedures/work instructions 5.3. Return mould segments for reuse or storage in accordance with enterprise storage quality requirements
6. Inspect and store pipe	6.1. Inspect pipe outside diameter and ends/flanges for defects 6.2. Make allowable repairs in accordance with specification and procedures/work instructions 6.3. Identify and mark pipe with appropriate brand or identification number

ELEMENT	PERFORMANCE CRITERIA
	6.4. Apply appropriate interior surface coatings or coverings as required by the specification 6.5. Move pipe and store in compliance with enterprise storage quality/quantity requirements
7. Rectify routine problems	7.1. Identify the range of faults that can occur during the operation 7.2. Determine and rectify fault causes in accordance with procedures/work instructions 7.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 7.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 7.5. Identify non-routine problems and report to designated person

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 leading to unsafe machine operation and taking appropriate action
- recognising conditions which will lead to out of specification product and taking appropriate action
- implementing the enterprise's procedures and relevant regulatory requirements within time constraints and in a manner relevant to the operation of the equipment
- conveying information relevant to the operation clearly and effectively
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- operational aspects of the spinning equipment being employed
- appropriate safety procedures concerning the operation of the equipment
- procedures relating to the reporting of hazardous conditions

REQUIRED SKILLS AND KNOWLEDGE

- appropriate shut down 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

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 concrete to be spun and its additives are able to be identified
- individual material feed and distribution systems are understood
- OHS and safe work practices are followed
- mould is carefully checked for defects to ensure it is safe to spin
- unsafe spinning conditions are recognised and appropriate action taken
- mould and pipe transfer movements are monitored and appropriate safe working practices employed
- signage, tags and isolation procedures are conformed to
- 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 will require access to an operating plant over

EVIDENCE GUIDE	
assessment	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
Typical problems	Typical problems may include: - maintaining correct sectional thicknesses and distribution of materials - selecting optimum spinning speeds and conditions for the size of pipe being produced - correctly selecting and positioning/securing cages and inserts in moulds

RANGE STATEMENT	
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		

PMC552055C Conduct benching operations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the conducting of benching operations and the production of special purpose concrete, clay or refractory components. It involves ensuring the mould is correctly assembled, selecting the necessary tools and materials, ensuring correct inserts are available and ensuring finished product is to specification.

Application of the Unit

Application of the unit	This unit of competency applies to operators in a plant who are responsible for looking after the manual production of special purpose products largely formed from moulds or templates including resolving routine problems. This competency is typically performed by operators working either independently or as part of a work 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. Determine the shape of the work piece	1.1. Check the specification, drawing or client instructions 1.2. Calculate the angle of decline to be applied to the work piece 1.3. Determine the number of access and egress points to facilitate movement of liquids through the work piece 1.4. Identify and obtain components, reinforcing and/or other fitments as required by the specification.
2. Assemble and prepare the work piece	2.1. Establish a safe working environment which meets occupational health and safety (OHS) and enterprise requirements 2.2. Identify and prepare the appropriate liner or cover 2.3. Secure and level in accordance with procedures/work instructions 2.4. Check that the base is stabilised and correctly mounted as required to facilitate lifting or moving 2.5. Position components, reinforcing and/or other fitments as required by the specification
3. Rough cast the work	3.1. Prepare the concrete mix or obtain the material from

ELEMENT	PERFORMANCE CRITERIA
piece	the batch preparation unit 3.2.Ensure an adequate supply of material is available to meet production requirements 3.3.Free form the concrete inside the work piece to meet the rough dimensions required by the specification 3.4.Ensure that components, reinforcing and/or other fitments do not move during rough casting 3.5.Employ safe working practices which conform to OHS and enterprise requirements
4. Finish the work piece	4.1.Prepare a finishing mixture for application to the work piece 4.2.Apply the finishing coating, trowelling and sleeking the surface to specification 4.3.Ensure the work piece cures according to procedures/work practices 4.4.Remove any separators, non-permanent inserts, plugs or blinds 4.5.Release work piece in accordance with safe working practice and procedures 4.6.Return mould segments for reuse or storage in accordance with enterprise storage quality requirements
5. Rectify routine problems	5.1.Identify the range of faults that can occur during the operation 5.2.Determine and rectify fault causes 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. Inspect and store products	6.1.Inspect work piece for defects 6.2.Make allowable repairs in accordance with specifications and procedures/work instructions 6.3.Identify and mark work piece with appropriate brand or identification number 6.4.Apply appropriate surface coatings or coverings as required by the specification 6.5.Move work piece and store in compliance with

ELEMENT	PERFORMANCE CRITERIA
	enterprise storage quality/quantity requirements
7. Control hazards	7.1. Identify hazards from the job to be done 7.2. Identify other hazards in the work area 7.3. Assess the risks arising from those hazards 7.4. Implement measures to control those risks in line with 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 and taking appropriate action
- 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
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- hazards associated with the operation and materials in use
- operational procedures and safe work practices relevant to the operation
- composition and nature of finished product
- construction and limitations of the equipment
- out of specification situations
- types of defects/faults
- mechanical and manual causes of malfunctions;
- appropriate safety procedures concerning the handling of work pieces
- procedures relating to the reporting of hazardous 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

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 concrete and finishing materials are able to be identified
- OHS and safe work practices are followed
- work piece transfer movements are monitored and appropriate safe working practices employed
- 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.

EVIDENCE GUIDE	
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
Typical problems	Typical problems may include: • maintaining correct sectional thicknesses and distribution of materials • maintaining sectional profiles in accordance with specification • correctly selecting and positioning/securing permanent or non-permanent inserts, plugs or blinds, and/or reinforcing in moulds
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		

PMC552056B Assemble, fabricate and place reinforcement

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the interpretation of plans (steel drawings), the fabrication of reinforcement from pre-cut and bent steel and the placement of reinforcing steel cages and assemblies for manufactured concrete products.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for producing reinforced steel, cages and assemblies for insertion in concrete products. This unit of competency includes: • bars and mesh • bars and mesh prepared by reinforcement supplier • welding of reinforcement cages • wire tying of reinforcement cages • using automatic and semi-automatic reinforcement machines • the operation of all ancillary equipment. This competency is typically performed by an experienced operator working either independently or as part of a work 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 fabrication	1.1. Check quantities, type, size and shape of reinforcement supplied against drawings, tags and schedules 1.2. Prepare jigs and/or other assembly aids if applicable
2. Assemble/fabricate reinforcement	2.1. Assemble reinforcement using appropriate fixing method 2.2. Check final dimensions are to specification 2.3. Insert lifting devices, lugs, fittings, bar chairs and nibs according to standard operating procedures 2.4. Ensure minimum lap sizes are observed where applicable 2.5. Complete cage to enable lifting (if assembled)

ELEMENT	PERFORMANCE CRITERIA
	outside the mould) 2.6. Report any non-compliance 2.7. Follow all occupational health and safety (OHS) procedures and work instructions
3. Rectify routine problems	3.1. Identify the range of faults that can occur during the operation 3.2. Determine and rectify fault causes in accordance with 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 from the job to be done 4.2. Identify other hazards in the work area 4.3. Assess the risks arising from those hazards 4.4. Implement measures to control those risks in line with 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 problems 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 fabrication of reinforcement
- using appropriate fixing equipment such as tie wires and/or welding
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

REQUIRED SKILLS AND KNOWLEDGE

- relevant quality tests
- interpretation of plans, reinforcement designs, schedules, tags and specifications
- predicting final shape/dimension based on bar size/type and bend radius
- reinforcing materials
- design factors
- fabrication methodologies
- equipment needs and operations

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

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 reinforcement fabrication and placement process be understood and that the importance of critical material properties and specifications 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:

- fittings and lifting lugs are correctly positioned
- steel coverage is adequate
- dimensions/dimensional tolerance is correct
- appropriate grade of steel is used
- minimum lap sizes are observed where bar and/or fabric must be lapped
- reinforcement is fixed securely by tying or tack welding to prevent movement during casting.

Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.

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. 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
Typical problems	Typical problems may include: • dimensions and positions of fittings and lugs • incorrect cover to steel • incorrect size and shape of completed reinforcement • inadequate tying of assembled reinforcement

RANGE STATEMENT	
	• undercutting, which can burn part of the steel away • cropping bar inside a mould which can result in small off-cuts of bar falling to the bottom of the mould • assembling welded cages inside a steel mould which may produce welding spatter on the mould
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		

PMC552057B Finish casting operation

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the positioning and fitting of accessories and reinforcement to manufactured concrete products before they have been cured. It involves ensuring the stability of the mould, correctly positioning mould components, ensuring reinforcing is correctly placed and ensuring finished product is to specification.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for positioning and fitting accessories and reinforcements into concrete components. It may be used to top up and finish manufactured concrete products to specification. This unit of competency includes: • matching concrete to specification • fitting accessories and reinforcing • veneering • the positioning and fitting of accessories and reinforcement before curing, • veneering • topping up of moulded concrete products • the operation of all ancillary equipment. This competency is typically performed by operators working either independently or as part of a work 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. Adjust and level mould and accessories	1.1.Ensure position of mould base is level and stabilised according to standard operating procedures 1.2.Adjust level of pipes and other accessories already fitted as required
2. Position and fit reinforcement and accessories	2.1.Place reinforcement in green concrete according to work as required 2.2.Place fittings/accessories in concrete to specification
3. Top up mould and finish	3.1.Top up and cover mould according to work instructions

ELEMENT	PERFORMANCE CRITERIA
	3.2. Finish and patch product to specification 3.3. Clean mould and work site as required by good occupational hygiene practices
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes by procedures/work instructions 4.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 4.5. Identify non-routine problems and report to designated person
5. Control hazards	5.1. Identify hazards from the job to be done 5.2. Identify other hazards in the work area 5.3. Assess the risks arising from those hazards 5.4. Implement measures to control those risks in line with 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 and taking appropriate action
- 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:

REQUIRED SKILLS AND KNOWLEDGE

- topping up and finishing process
- principles of concrete mixing
- principles of reinforcing concrete to specification
- principles of fitting accessories to specification
- principles of concrete product finishing
- underlying causes of faults such as precipitated by:
 - material
 - mixing
 - application
 - finishing

Evidence 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 process be understood and that the importance of critical material properties, mixing variables, topping up and fitting of accessories 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:

- reinforcing is fitted according specification
- accessories are fitted as required by work instructions
- moulded product is level, according to specification.

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 will require access to an operating plant over an extended period of time, or a suitable method of

EVIDENCE GUIDE	
assessment	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
Typical accessories	Typical accessories may include: • hooks • pipes • rubber tubing
Typical veneering	Typical veneering may include: • screeding • floating • helicopter floating

RANGE STATEMENT	
	brushing
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		

PMC552058B Demould concrete products

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the dismantling, reassembling, lubrication and stock control of complex concrete product moulds.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for removing a mould from a competed concrete product and preparing it for a new moulding operation. This unit of competency includes: • timber, glass fibre, metal, plaster, latex rubber and other moulds • use of hand tools as required • interpretation of production schedules/work cards as appropriate • interpreting plans or specifications • the operation of all ancillary equipment. This competency is typically performed by operators working either independently or as part of a work team. It also includes the interpretation of drawings/plans.

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. Dismantle mould	1.1.Remove nuts and bolts as required 1.2.Remove mould
2. Clean and inspect mould	2.1.Identify product faults from visual inspection 2.2.Identify mould faults from visual inspection 2.3.Dismantle mould as per work instructions 2.4.Check condition of all mould parts 2.5.Clean mould parts
3. Reassemble mould	3.1.Identify product to be made 3.2.Interpret mould drawings/plans 3.3.Select and check required mould parts 3.4.Use correct mould setup jig 3.5.Assemble mould as per work instructions

ELEMENT	PERFORMANCE CRITERIA
	3.6. Place and fix reinforcement cage as required 3.7. Check cover is adequate and fix or report as required 3.8. Check mould dimensions and tolerance 3.9. Check mould for joint leakage and correct if required
4. Lubricate mould	4.1. Lubricate mould to standard 4.2. Store mould in correct location
5. Maintain mould part stock control	5.1. Check stocks of spare parts 5.2. Advise supervisor of stock required, parts used and date of completed mould
6. Rectify routine problems	6.1. Identify the range of faults that can occur during the operation 6.2. Determine and rectify fault causes in accordance with procedures/work instructions 6.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions 6.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions 6.5. Identify non-routine problems and report to designated person
7. Control hazards	7.1. Identify hazards from the job to be done 7.2. Identify other hazards in the work area 7.3. Assess the risks arising from those hazards 7.4. Implement measures to control those risks in line with 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 mould and dies being incorrectly assembled and taking appropriate action

REQUIRED SKILLS AND KNOWLEDGE

- 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
- recognising worn moulds and parts
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- causes of mould wear
- results of using worn moulds
- problems resulting from mould leakage
- required lubrication of mould
- hazards from prestressed reinforcement
- underlying causes of faults such as precipitated by:
 - mould
 - casting/operating
 - concrete mix
 - vibration

Evidence 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 be understood and that the importance of critical mould properties and dimensions 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:

EVIDENCE GUIDE	
	• moulds are withdrawn for repair as required • moulds drawn from the mould store are in good order • stocks of spares are kept at appropriate levels • correct moulds are available for required jobs • mould is lubricated to standard • moulds are made consistently within an appropriate timeframe and with minimum faults • good OHS practice is used consistently. 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

RANGE STATEMENT	
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
Typical problems	Typical problems may include: • recognition of parts requiring replacement (e.g. stretched rubber, missing bolts) • selection of appropriate mould parts to replace worn parts • interpretation of drawings and matching reinforcement and moulds to drawing
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		

PMC552060C Batch mix concrete

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the selection of materials, batching and loading of different grades and amounts of concrete to meet production needs and the required standards.

Application of the Unit

Application of the unit	This unit of competency applies to operators of concrete batching plants in the pre-mixed and/or manufactured concrete products industries. It includes both wet and dry batching. It is NOT intended to apply to the use of manually charged/discharged concrete mixers such as might be used by builders on sites. <i>PMC551003B Operate equipment applies to those mixers.</i> This unit of competency includes the operation of the batching plant using PLCs where applicable and of all equipment which is ancillary to the operation of the batching plant. The operation of equipment such as front end loaders, conveyors and hoppers are covered by other units (see <i>PMC562070B Move materials</i>, <i>PMC562071C Operate bulk materials handling equipment</i>). In a typical scenario an operator runs the concrete batching equipment to meet product specifications and delivery requirements and/or production schedules. The operator is able to read and interpret these requirements and make necessary adjustments to meet the specifications. This competency is typically performed by operators working either independently or as part of a 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. Determine mix requirements	1.1. Identify job requirements 1.2. Select the correct type and quantity of materials as required 1.3. Meet special requirements and specifications 1.4. Identify any material handling problems and take the appropriate action 1.5. Update material records as required

ELEMENT	PERFORMANCE CRITERIA
2. Batch mix raw materials	2.1. Set up and operate batching and/or mixing equipment to specifications and procedures 2.2. Batch materials as required by specifications and procedures 2.3. Check that materials prepared match requirements 2.4. Use ancillary equipment as required according to procedures 2.5. Discharge batched concrete into delivery trucks/mixers
3. Monitor batch mixing process	3.1. Check and adjust settings as required 3.2. Make routine checks and recognise developing problems 3.3. Recognise equipment in need of maintenance/repair 3.4. Take samples and interpret test results as required 3.5. Ensure the production process and product complies with the appropriate quality procedures 3.6. Complete all required records
4. Maintain batch mixing plant and area	4.1. Keep the area and equipment clean and in good order 4.2. Shut down equipment as required 4.3. Complete maintenance checklists as required 4.4. Respond to routine faults according to procedures 4.5. Report non-routine faults according to procedures
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 5.3. Identify and rectify equipment failure causes in accordance with procedures 5.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures 5.5. Identify non-routine problems and report to designated person
6. Control hazards	6.1. Identify hazards from the job to be done 6.2. Identify other hazards in the work area 6.3. Assess the risks arising from those hazards 6.4. Implement measures to control those risks in line with 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 organisation's procedures and relevant regulatory requirements within time constraints and in a manner relevant to the operation of the equipment
- conveying information relevant to the operation clearly and effectively
- supervising delivery drivers as required by procedures
- numeracy and literacy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- understanding of the equipment sufficient to operate it, recognise potential problems and to take appropriate action
- organisation's procedures and relevant regulatory requirements, such as:
 - principles of operation of batching and mixing equipment
 - principles of batching and mixing these products
 - impact of variations in raw materials on the final product
 - impact of mixing on final product
 - organisation's production and/or delivery schedules
- causes of faults such as those precipitated by:
 - raw material inaccuracies
 - equipment failures
 - mixing time/technique 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

EVIDENCE GUIDE	
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	Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • batches are produced on time and in specification • upstream and downstream communication is timely and effective • problems are anticipated and appropriate action is taken (i.e. problem fixed or reported). 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. Simulations may also include the use of case studies and scenarios. 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	This unit may be assessed in conjunction with: • PMC561080B Organise self • MSAPMSUP106A Work in a team. Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes. In remote operations, this person may also need scheduling and other material ordering and handling competencies.

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

Job requirements

Job requirements may be determined from:

- work schedule
- job specification
- job card
- batch card
- computerised system
- other

Sampling and testing

Sampling and testing may be required for:

- moisture content
- particle size
- other

Variations

Variations may include:

- nature and type of plant configuration
- nature and type of material or product to be batched/mixed
- conditions under which the product is to be employed including weather conditions

Typical problems

Typical problems include:

- equipment malfunction
- raw material specifications

RANGE STATEMENT	
	• mixing tolerance • uniform dispersion of minor ingredients/additives • mixing to colour/other special requirements • matching mixes produced with production requirements • adjusting mix formula to compensate for variations in raw materials (e.g. sand moisture content)
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		

PMC552061C Deliver concrete to site

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the efficient delivery of quality concrete to site using an agitator or similar.

Application of the Unit

Application of the unit	This competency covers the efficient delivery of quality concrete to site using an agitator or similar. It includes the operation of all ancillary equipment and the operation of plant using PLCs where appropriate. This competency is NOT intended to be used for the delivery of concrete within a site using mobile equipment or overhead cranes. <i>PMC562070B Move materials</i> should be used in these circumstances. In a typical scenario the agitator will be truck mounted. This unit does not cover the driving of the truck. Local regulations should be consulted and complied with. Typically an operator would: • deliver premix concrete to a customer. • determine the product/delivery requirements from the production schedule, specifications, delivery docket and/or other specifications. • resolve and prevent routine problems; and • ensure the delivered product is to specification. The operator generally works independently with frequent contact with the base plant.

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. Load agitator.	1.1. Check job requirements 1.2. Position agitator for loading 1.3. Load agitator with correct concrete batch 1.4. Check any special requirements and take action required. 1.5. Check that slump is to specification and take any action required
2. Deliver concrete.	2.1. Deliver concrete without delay 2.2. Position vehicle/agitator as required by safety needs

ELEMENT	PERFORMANCE CRITERIA
	and if practical customer requirements 2.3. Report breakdowns or lengthy delays en route to relevant person 2.4. Maintain product quality as per requirements and procedures.
3. Conform to site protocols	3.1. Check access to site with customer 3.2. Assess site conditions and enter in a manner suited to the conditions, load and site requirements 3.3. Mix concrete on site as per quality requirements 3.4. Discharge concrete as required by customer 3.5. Wash down chutes and agitator in the area designated by the customer 3.6. Complete all records
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with procedures/work instructions 4.3. Identify and rectify equipment failure causes in accordance with procedures 4.4. Make sure appropriate records and log books of equipment operations are maintained to meet procedures 4.5. Identify non-routine problems and take appropriate action. 4.6. Ensure required checklists are completed
5. Control hazards	5.1. Identify hazards from the job to be done 5.2. Identify other hazards in the work area 5.3. Assess the risks arising from those hazards 5.4. Implement measures to control those risks in line with procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Skills required for this unit include the ability to:

- communicate with customers
- determine, and meet customer requirements while maintaining HSE standards
- deliver product to site on time and within specification
- operate the equipment safely

Reading and numeracy is required to the level of interpreting workplace documents and technical information.

Required knowledge

- Knowledge and understanding of the equipment sufficient to recognise problems and the appropriate action to be taken.
- Knowledge of the organisation's procedures 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.
- Knowledge of:
 - the relationship between mixing time/water cement ratio and product quality
 - importance of slump
 - quality procedures
 - handling techniques to maintain quality
- Knowledge of underlying causes of faults such as precipitated by:
 - irregular mixing action
 - mechanical failure
 - electrical equipment malfunction

as is relevant to the practical operation of the 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

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

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

EVIDENCE GUIDE	
competency in this unit	implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • concrete is delivered in full, on time and in specification • there are good relations with the customers • there is good liaison with the batching plant. 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 for this unit of competency will be on an operating work site. 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 competency unit (e.g., those parts of element 3 referring to dealing with customers). 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. 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	It may be appropriate to assess this unit together with: • TLIC407D Drive heavy rigid vehicle • TLIC307C Drive medium rigid vehicle • TLIC507D Drive heavy combination vehicle or such other unit as may be appropriate. This unit may be assessed in conjunction with: • MSAPMSUP280A Manage conflict at work • PMC562081B Deliver customer service. 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	All operations are performed in accordance with standard procedures and work instructions.
Special requirements	Special requirements may be noted on the docket or instructed by the batcher or otherwise communicated. Special requirements may include the addition of water.
Relevant person	Relevant person for reporting delays/breakdowns may include batcher, dispatcher or other person as specified in the procedures.
Records	Completion of records must include: - the addition of water - other items identified in the procedures and where possible the customer signature. Records may be completed on the docket or other means as specified in the procedures.
Checklists	Required checklists may include: - maintenance checklists - pre start checklists - other checklists

RANGE STATEMENT	
Context	This unit includes: - determining and adding the correct amount of water taking into account required specification and moisture/water already in the mix - measurement of slump or similar tests - customer service and product knowledge - knowledge of relevant road rules and waste disposal requirements. - It does NOT include the driving of the truck (which is a prerequisite). However the driver's road skills should be observed to ensure that they meet the business's standards. It does NOT include the driving of the truck. However, the driver's road skills should be observed to ensure that they meet the business's standards.
Typical problems	Typical problems may include: - sites with poor access/unstable soil - transportation/site delays - site conflicts - disposal of agitator washings

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC552065B Prepare asphalt

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the batching of asphalt using either a batch or continuous plant. It involves selecting, drying and blending of the correct aggregates and blending with bitumen to make the desired grade of asphalt.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for mixing asphalt using a range of pug and drum mixers and for a range of purposes. It is intended to apply to batching plants as used by the asphalt industry and may cover batch, continuous, fixed and mobile plants. This unit covers both the use of natural bitumen such as is obtained from oil refineries and synthetic bitumen used for coloured asphalt. It includes the operation of all ancillary equipment and the operation of plant using PLCs where appropriate. This competency is typically performed by operators working either independently or as part of a work 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 mix requirements	1.1. Check work schedule/job specification/job card 1.2. Select correct type and quantity of aggregates and other materials 1.3. Meet all special requirements and specifications 1.4. Identify any material handling problems and take action in accordance with standard procedures 1.5. Update material records as appropriate
2. Mix asphalt	2.1. Check setup of equipment as required by specifications and standard procedures 2.2. Set/adjust plant conditions as required for required product 2.3. Feed aggregate to dryer at required rates 2.4. Prepare bitumen and other materials and add to mixer as required by specifications and standard

ELEMENT	PERFORMANCE CRITERIA
	procedures 2.5. Check that materials prepared match requirements 2.6. Use ancillary equipment as required according to standard procedures 2.7. Mix to obtain required results 2.8. Discharge product to asphalt storage/delivery
3. Monitor asphalt process	3.1. Check and adjust settings as required 3.2. Make routine checks and recognise developing problems 3.3. Recognise equipment in need of maintenance/repair 3.4. Take sample and interpret test results as required 3.5. Take appropriate action to ensure continuing quality production according to standard procedures 3.6. Complete all required records
4. Maintain batching plant and area	4.1. Keep area and equipment clean and in good order 4.2. Unload and shut down equipment as required 4.3. Respond to routine faults according to enterprise procedures 4.4. Report non-routine faults according to enterprise procedures
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. Control hazards	6.1. Identify hazards from the job to be done 6.2. Identify other hazards in the work area 6.3. Assess the risks arising from those hazards 6.4. Implement measures to control those risks in line with 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 potential problems and taking appropriate action
- 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 the equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- principles of drying of aggregates
- principles of mixing these products
- impact of variations in raw materials on final product
- impact of mixing on final product
- enterprise production schedules
- distinguish between causes of faults such as:
 - raw material
 - equipment
 - 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.

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 and mixing variables is known. Competence must be demonstrated in the ability to recognise and analyse potential situations

EVIDENCE GUIDE	
	requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • product is produced on time and in specification • upstream and downstream communication is timely and effective • problems are anticipated and appropriate action is taken (i.e. problem fixed or reported). 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	This unit may be assessed in conjunction with: • PMC561080A Organise self • MSAPMSUP106A Work in a team. Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes. In remote operations, this person may also need scheduling and other materials ordering and handling competencies.
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
Aggregate	Aggregate may include: the normal range of gravels and sand as well as recycled asphalt pavement (RAP) It may, or may not, include the addition of special aggregates such as slag, carborundum, lime or crushed garnets
Typical problems	Typical problems may include: - equipment malfunction - raw material specifications - mixing tolerance - uniform dispersion of minor ingredients/additives - mixing to special requirements - matching mixes produced with production requirements - adjusting mix formula to compensate for variations in raw materials (e.g. aggregate moisture content)

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC552070B Operate forming equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of forming equipment in the production of plasterboard, cornice and fibre cement sheet manufacture. It involves operating and monitoring forming equipment, making adjustments in accordance with work instructions, undertaking routine quality checks and undertaking minor maintenance on equipment.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating forming equipment within the manufactured mineral products industry. 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 forming equipment for production	1.1. Set up line in accordance with work instructions 1.2. Determine product formation requirements from the production program 1.3. Conduct equipment pre-startup procedure and visual checks according to enterprise procedure check list 1.4. Ensure required change parts are in place 1.5. Set up and configure equipment startup functions to comply with standard operating procedures 1.6. Ensure equipment is safe to use
2. Operate forming equipment	2.1. Start up equipment in accordance with work instructions 2.2. Operate equipment to produce product of required shape, dimensions and consistency 2.3. Monitor equipment conditions and adjust to ensure correct product quality 2.4. Monitor and adjust material properties as required 2.5. Record production data 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 established

ELEMENT	PERFORMANCE CRITERIA
	enterprise procedures/work instructions 3.3. Identify and rectify equipment failure causes in accordance with established enterprise procedures 3.4. Identify non-routine problems and report to designated person
4. Shut down equipment	4.1. Ensure line is clear of all product and left in a safe manner for startup 4.2. Determine and rectify fault causes in accordance with procedures/work instructions 4.3. Clean work area 4.4. Complete appropriate records and logs 4.5. Shut down equipment in an emergency situation
5. Prepare equipment for cleaning and maintenance	5.1. Isolate equipment in accordance with work instructions 5.2. Remove any remaining product or materials safely 5.3. Ensure the area is clear and safe for cleaning or maintenance
6. Control hazards	6.1. Identify hazards from the job to be done 6.2. Identify other hazards in the work area 6.3. Assess the risks arising from those hazards 6.4. Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production and taking appropriate action
- 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 the equipment
- reading and numeracy to interpret workplace documents and technical information

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Required knowledge includes:

- composition and nature of products being manufactured
- startup and shutdown processes
- construction and limitations of the equipment
- identification of required adjustments to keep process within specifications
- identification of out of specification situations
- distinguish between causes of faults such as:
 - raw material
 - equipment adjustment setup
 - maintenance issues

Evidence 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 forming 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:

- process and equipment are operated in accordance with work instructions and process parameters
- quality is monitored to minimise wastage
- startup and shutdown occur first time
- signals and alarms are responded to immediately
- process measurements and tests are continually made, observed and interpreted

EVIDENCE GUIDE	
	all OHS requirements are followed. 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. 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 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	
Operations	This unit of competency includes the operation of items of equipment where the operator is expected to demonstrate an understanding of the process and the equipment operation. The processes covered by this unit include: • fibre cement board • plaster board • machine cornices
Tools and equipment	Tools and equipment may include: • curing ovens • transfer machines • scoring • plasterboard liner unwinders/burners • setting belts • forming plates/dams • mixers • pizza cutters/blades • hand tools • safety clothing and equipment
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		

PMC552071B Operate wet and dry end equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of wet and dry end equipment in the production of plasterboard, cornice and fibre cement sheet. It involves operating and monitoring equipment, undertaking quality checks, preparing roll-ups and undertaking minor maintenance on equipment.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for operating wet and dry end equipment within the manufactured mineral products industry. This unit of competency includes the operation of items of equipment where the operator is expected to demonstrate an understanding of the process and the equipment operation. The processes covered by this unit include: • fibre cement board • plaster board • machine cornices This competency is typically performed by operators and team leaders 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 equipment for production	1.1. Set up line in accordance with work instructions 1.2. Conduct equipment pre-startup procedure and visual checks according to enterprise procedure check list 1.3. Set up and configure equipment startup functions to comply with standard operating procedures 1.4. Ensure equipment is safe to use
2. Operate wet end/dry end equipment	2.1. Conduct pre-run checks and make adjustments as required 2.2. Start up equipment in accordance with work instructions 2.3. Monitor equipment conditions and adjust to ensure correct product quality 2.4. Ensure equipment is operated in accordance with

ELEMENT	PERFORMANCE CRITERIA
	enterprise procedures 2.5. Record production data as required
3. Monitor and record operation	3.1. Monitor equipment performance in accordance with work instructions and manufacturer's specifications 3.2. Monitor non-conforming product against customer specifications 3.3. Adjust and control equipment to ensure correct product quality 3.4. Complete final inspection checks if required 3.5. Complete appropriate records and logs
4. Rectify routine problems	4.1. Identify the range of faults that can occur during the operation 4.2. Determine and rectify fault causes in accordance with established enterprise procedures/work instructions 4.3. Ensure appropriate records are maintained to meet procedures/work instructions 4.4. Identify non-routine problems and report to designated person
5. Shut down equipment	5.1. Ensure line is clear of all product and left in a safe manner for shutdown 5.2. Determine and rectify fault causes in accordance with procedures/work instructions 5.3. Ensure work area is clean 5.4. Complete appropriate records and logs 5.5. Shut down equipment in an emergency situation
6. Prepare equipment for cleaning and maintenance	6.1. Isolate equipment in accordance with work instructions 6.2. Remove any remaining product or materials safely 6.3. Make sure the area is clear and safe for cleaning or maintenance
7. Control hazards	7.1. Identify hazards from the job to be done 7.2. Identify other hazards in the work area 7.3. Assess the risks arising from those hazards 7.4. Implement measures to control those risks in line with procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Skills required for this unit include the ability to:

- 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 equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of products being manufactured
- startup and shutdown processes
- construction and limitations of the equipment
- drying profiles
- identification of required adjustments to keep process within specifications
- identification of out of specification situations
- distinguish between causes of faults such as:
 - raw material
 - equipment adjustment setup
 - maintenance issues

Evidence 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

It is essential that the forming equipment be understood and that the importance of critical material properties,

EVIDENCE GUIDE	
competency in this unit	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: • process and equipment are operated in accordance with work instructions and process parameters • quality is monitored to minimise wastage • drying profiles/operations are maintained • startup and shutdown occurs first time • signals and alarms are responded to immediately • process measurements and tests are continually made, observed and interpreted • all OHS requirements are followed. 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. 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 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
Tools and equipment	Tools and equipment may include: • drier • cooler • unloader • bridge conveyor • split and reject table • belts • booker system table • hand tools • safety clothing and equipment
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		

PMC552072B Produce fibrous plasterboard

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the production of fibrous plasterboard. It involves facilitating the mixing operation, ensuring plaster is of the correct consistency and formulation, maintaining a clean work environment, manually combining the fibre and plaster, cutting sheets to size and turning out sheets to facilitate final curing.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for the manufacture of fibrous plaster sheeting using a mixture of plaster material and fibre. Operators produce much of the product by hand with the full sheets cut to length after the product has set. Generally the operator would be part of a team during the process and 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 the production area	1.1.Ensure the production area is clean and free from debris and waste 1.2.Ensure the production area is ready to receive the plaster mixture and that all equipment is ready 1.3.Apply stripping agent to the production facility to ensure ease of removal of the product after setting of the plaster mix
2. Mix plaster	2.1.Ensure that appropriate materials are available to facilitate mixing and production of plaster mix 2.2.Check that the mixer is clean and free from debris and that there are no obstructions or contaminants present 2.3.Check that the mixing equipment is safe to use 2.4.Introduce materials to the mixer and add temper water to specification 2.5.Mix the plaster for the required time and consistency 2.6.Discharge the mixed plaster from the mixer when it reaches the desired consistency
3. Produce fibrous plasterboard	3.1.Insert the fibre into the plaster mix 3.2.Form the plasterboard to the desired size and screed

ELEMENT	PERFORMANCE CRITERIA
	off 3.3. Check the plaster sheets for entrapped air or the inclusion of unwanted materials or contamination 3.4. Ensure product is of the required uniform thickness 3.5. Allow the product to dry and prepare to strip the product
4. Strip and finish the product	4.1. Cut the finished product to the required dimensions 4.2. Strip the product and inspect for imperfections and distortion 4.3. Hang the product for final drying 4.4. Remove the product from the dryer and undertake final inspection 4.5. Stack the product according to size and prepare for storage or shipment
5. Control hazards	5.1. Identify hazards in mixing and casting areas 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 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 designated person

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 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 melting equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of materials being utilised
- equipment startup and shutdown processes
- drying times and conditions
- out of specification situations
- distinguish between causes of faults such as:
 - incorrect raw materials
 - equipment maladjustment
 - contamination or poor 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, 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 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:

EVIDENCE GUIDE	
	• work area is maintained appropriately • plaster is mixed to required consistency • plasterboard is formed correctly • finished product meets required dimensions • 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	Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes. 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 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

RANGE STATEMENT	
regional contexts) may also be included.	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Equipment	Equipment may include: • mixers • moulds or formers • lifting equipment • cutting equipment • drying and other equipment integral to the manufacture of fibrous plasterboard
Fibre	Fibre may include: • glass fibre or other appropriate fibre
Typical problems	Typical problems may include: • inappropriate material specifications • introduction of contaminants • inclusion of air • distortion or section thickness variations
Occupational health and safety (OHS)	The identification and control of hazards and the application of OHS are 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		

PMC552090B Use and maintain tools and equipment for refractory operations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the maintenance and use of common tools and equipment used for refractory operations. It involves checking that they are in a usable condition and taking appropriate action if they are not.

Application of the Unit

Application of the unit	This unit of competency applies to operators working in the refractory sector who use tools and equipment for the manufacture and/or installation of refractory materials. This could apply to tools and equipment used in a manufacturing facility or for the on-site installation of refractories and includes the cleaning of the tools and equipment and inspection for wear and tear or damage. This competency is performed by all operators working with tools and equipment and may be undertaken as part of working in a team environment.

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 set up tools and equipment	1.1. Check the information about the required resources is accurate and available for use according to work practices 1.2. Identify incorrect or incomplete information and take the necessary corrective action 1.3. Select and set up the required resources to conform with the information and, where they are unsuitable, take the necessary corrective action
2. Use tools and equipment	2.1. Use appropriate tools and equipment to procedures 2.2. Inspect tools/equipment for wear/damage and rectify or report as appropriate 2.3. Clean tool/equipment and return to correct location after use
3. Contribute to the provision of a safe work environment	3.1. Identify hazards in work area particularly from blending/mixing 3.2. Assess the risks arising from those hazards

ELEMENT	PERFORMANCE CRITERIA
	3.3. Implement measures to control those risks in line with procedures and duty of care
4. Control hazards	4.1. Identify hazards from the job to be done 4.2. Identify other hazards in the work area 4.3. Assess the risks arising from those hazards 4.4. Implement measures to control those risks in line with 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:

- adjusting/correcting/responding to procedures
- identifying and responding to problems
- using tools and equipment correctly
- working in a team or individually as required
- inspection of tools and equipment
- cleaning of tools and equipment
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- the variety of equipment used
- equipment application and its maintenance procedures
- procedures related to this competency
- typical problems with equipment applicable to this competency
- procedures for reporting or dealing with typical equipment problems
- materials sources
- materials types/categorisation
- methods of production
- familiarity with installation techniques
- familiarity with principles of selection
- familiarity with variety of applications

Evidence 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	Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • situations which are out of the normal, 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.
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	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:

EVIDENCE GUIDE	
	MSAPMOHS200A Work safely.
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
Information	Information to be used includes: - organisational requirements - oral and written instructions - manufacturer's technical information
Corrective action	Corrective action to be taken includes: - correcting within your own authority - reporting to the person in charge - complying with company procedures
Work practices	Work practices include: - setting up, maintaining and using tools and equipment - interpreting information - identifying, selecting and setting up tools and equipment - identifying hazards - working as an individual organising your own work - working as part of a team
Tools and equipment	Tools and equipment include:

RANGE STATEMENT	
	• manual tools and equipment • powered tools and equipment
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.
Responding to problems	The responding to problems or non-conforming situations is restricted to responding in a routine, predetermined manner as specified in the relevant procedures. All operations are performed to procedures.

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC552091B Prepare for, install and repair refractory brickwork/blockwork

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the installation of refractory brickwork. It includes the use of tools and ancillary equipment and the mixing and application of appropriate mortars.

Application of the Unit

Application of the unit	This unit of competency applies to operators who install and/or repair refractory bricks and blocks. Brickwork/blockwork may be the total requirements for the job, or it may need to join to moulded or cast refractory. This unit does NOT cover the installation of mouldable or cast refractory, refer to <i>PMC552092B Prepare for and install mouldable refractory materials</i> or <i>PMC552093B Prepare for and cast refractory materials</i> This unit of competency also includes the mixing and application of refractory mortars as part of the installation. This competency will typically be performed by a team of operators working under direction and to a specification and/or procedures.

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. Establish the suitability of resources	1.1. Check all information conforms with resources 1.2. Report any inaccuracies in information to the person in charge 1.3. Identify and select materials, components, tools and equipment 1.4. Identify hazards associated with materials, components, tools and equipment and take appropriate steps to minimise hazard
2. Prepare, repair and install refractory brickwork/blockwork	2.1. Carry out work practices to comply with the given information and achieve the required specification 2.2. Organise work practices to complete work within the allocated time and to comply with the given information 2.3. Correct any deficiencies in the quality of work 2.4. Carry out work practices to comply with the given

ELEMENT	PERFORMANCE CRITERIA
	information to minimise the risk of damage to the work and surrounding work area 2.5. Comply with organisational information when carrying out work practices to maintain safe working procedures
3. Contribute to controlling hazards in work area	3.1. Identify hazards in work area 3.2. Assess risks arising from those hazards 3.3. Take appropriate action to control risks to 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:

- adjusting/correcting/responding to work procedures
- identifying and solving problems
- manual skills
- physical handling skills
- using tools and equipment safely
- working in a team or individually, as required
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- how to prepare for and install refractory brickwork/blockwork
- the organisation's requirements relating to your responsibilities for installing refractory brickwork/blockwork
- types and characteristics of background surfaces
- methods of preparing background surfaces
- types, uses and operation of tools and equipment
- types of finishes to completed brickwork/blockwork
- types and uses of jointing materials
- methods of jointing
- reasons for avoiding voids in joints

REQUIRED SKILLS AND KNOWLEDGE

- types of, and reasons for, expansion joints
- types and uses of temporary support
- methods of protecting work during installation
- reasons for, and methods of, providing test panels
- methods of cutting
- safeguards to take during reinstatement work
- methods of removing damaged refractory
- methods of keying and bonding new to existing refractories
- reasons for, and methods of, obtaining seals between new and existing refractory
- materials sources
- materials types/categorisation
- methods of production
- familiarity with installation techniques
- familiarity with principles of selection
- familiarity with variety of applications

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- 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.

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

EVIDENCE GUIDE	
	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.
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
Tools and equipment	Tools and equipment include: • mortar mixing equipment • trowels • lifting and placing equipment • equipment allowing access
Installation	Installation includes: • laying patterns (e.g. stretcher bond)

RANGE STATEMENT	
	• correct thickness of course • laying bricks/blocks to conform to required curves and angles • tying bricks/blocks to structure • keying bricks/blocks to existing refractory
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		

PMC552092B Prepare for and install mouldable refractory materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the installation of mouldable refractory. It includes the use of tools and ancillary equipment and the mixing and application of appropriate mortars.

Application of the Unit

Application of the unit	This unit of competency applies to operators who install and/or repair mouldable refractory materials. Moulded refractory may be the total requirements for the job, or it may need to join to brick/block or cast refractory. This unit does NOT cover the installation of brick/block or cast refractory, refer to <i>PMC552091B Prepare for, install and repair refractory brickwork/blockwork or PMC552093B Prepare for and cast refractory materials</i>. This competency also includes the mixing and application of refractory mortars as part of the installation. This competency will typically be performed by a team of operators working under direction and to a specification and/or 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. Establish the suitability of resources	1.1. Check all information conforms with resources and pneumatic ramming equipment
2. Prepare for and install mouldable refractory materials	2.1. Prepare backgrounds, such as cutting out, demolition and keying 2.2. Organise work to meet work deadlines 2.3. Install refractory to appropriate procedures 2.4. Carry out remedial work to meet the specifications 2.5. Inform the person in charge that installation and any remedial work have been completed 2.6. Store tools and equipment following organisational requirements for current legislation and official guidance

ELEMENT	PERFORMANCE CRITERIA
3. Contribute to controlling hazards in work area	3.1. Identify hazards in work area 3.2. Assess risks arising from those hazards 3.3. Take appropriate action to control risks to 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:

- adjusting/correcting/responding to work procedures
- identifying and solving problems
- manual skills
- physical handling skills
- using tools and equipment correctly and safely
- working in a team or individually, as required
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- the organisation's requirements relating to responsibilities for installing mouldable refractory materials
- types and characteristics of background surfaces
- methods of preparing background surfaces
- types, uses and operation of tools and equipment
- methods of compacting mouldable materials
- effects of under- or over-ramming mouldable materials
- reasons for anchors and methods of ensuring compaction of mouldable refractory around the anchors
- types and methods of finishing the surface of the installed mouldables
- types and uses of temporary support/formwork
- methods of protecting work during installation
- reasons for, and methods of, providing test panels
- methods of cutting
- safeguards to take during reinstatement work

REQUIRED SKILLS AND KNOWLEDGE

- methods of removing damaged refractory
- methods of keying and bonding new to existing refractories
- reasons for, and methods of, obtaining seals between new and existing refractory
- materials sources
- materials types/categorisation
- methods of production
- familiarity with installation techniques
- familiarity with principles of selection
- familiarity with variety of applications

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- 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.

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

EVIDENCE GUIDE	
	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.
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
Tools and equipment	Tools and equipment include: • moulding tools • refractory mixing equipment • lifting and placing equipment • equipment allowing access
Installation	Installation includes: • moulding to shape • correct thickness/cover • conforming to required curves and angles while maintain cover • tying mouldable to structure • keying to existing refractory
Occupational health and safety	All operations are subject to stringent OHS

RANGE STATEMENT	
(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		

PMC552093B Prepare for and cast refractory materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the casting of refractory. It includes the use of tools and ancillary equipment.

Application of the Unit

Application of the unit	This unit of competency applies to operators who install and/or repair refractory bricks and blocks. Cast refractory may be the total requirements for the job, or it may need to join to moulded or brick/block refractory. This unit does NOT cover the installation of brick/block or mouldable refractory, refer to <i>PMC552091B Prepare for, install and repair refractory brickwork/blockwork</i> or <i>PMC552092B Prepare for and install mouldable refractory materials</i>. This unit includes the mixing of castable refractory. This competency will typically be performed by a team of operators working under direction and to a specification and/or procedures.

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. Establish the suitability of resources	1.1. Check all information conforms with resources 1.2. Record discrepancies in information 1.3. Report any inaccuracies in information to the person in charge 1.4. Identify and select materials, components, tools and equipment
2. Mix, place and compact refractory concrete	2.1. Mix refractory concrete 2.2. Place and compact refractory concrete 2.3. Vibrate refractory concrete 2.4. Remove and reinstate damaged refractory concrete 2.5. Provide and remove temporary supports/formwork 2.6. Maintain tools and equipment
3. Contribute to controlling hazards in work area	3.1. Identify hazards in work area 3.2. Assess risks arising from those hazards 3.3. Take appropriate action to control risks in

ELEMENT	PERFORMANCE CRITERIA
	accordance 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:

- observing and monitoring work procedures
- adjusting/correcting/responding to sources of information
- identifying and solving problems
- manual skills
- physical handling skills
- using tools and equipment correctly and safely
- working in a team or individually, as required
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- methods of preparing background surfaces
- types, uses and operation of tools and equipment
- methods of compacting materials by hand and with vibration equipment
- correct selection and use of anchors
- types and methods of finishing the surface of the concrete
- reasons for, and timing of, dedicated curing and heat-up programs and the consequences for the installed concrete if the program is not correctly followed
- types and uses of temporary support/formwork
- methods of protecting work during installation
- reasons for, and methods of, providing test panels
- methods of cutting
- safeguards to take during reinstatement
- methods of removing damaged refractory
- methods of keying and bonding new to existing refractories
- reasons for, and methods of, obtaining seals between new and existing refractory
- materials sources
- materials types/categorisation

REQUIRED SKILLS AND KNOWLEDGE

- methods of production
- familiarity with installation techniques
- familiarity with principles of selection
- familiarity with variety of applications

Evidence 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

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:

- refractory cement has the required degree of compaction (neither too little nor too much) and that the casting conforms to requirements
- all OHS requirements are followed.

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

EVIDENCE GUIDE	
	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. 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 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
Tools and equipment	Tools and equipment include: • mixers • pumps • vibrators • lifting equipment • equipment allowing access
Installation	Installation includes: • correct thickness • conforming to required curves and angles • maintaining cover • tying to structure • keying to existing refractory

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	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC552094B Prepare for and apply shotcrete for installation

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency cover the use of the guniting/shotcrete technique to apply refractory materials. The refractory may be applied by wet or dry processes..

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for using the shotcrete technique to apply refractory materials. Shotcrete is often referred to by trade name of guniting and so the process is sometimes referred to as guniting. It involves setting out work, installing and applying guniting materials, assembling and operating guniting equipment, and removing and reinstating guniting materials. It includes the use of tools and ancillary equipment. Shotcrete work may be the total requirement for the job, or it may need to join to brick/block, moulded or cast refractory. This competency will typically be performed by a team of operators working under direction and to a specification and/or 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. Establish the suitability of resources	1.1. Check all information conforms with resources 1.2. Record discrepancies in information 1.3. Report any inaccuracies in information to the person in charge 1.4. Identify and select materials, components, tools and equipment
2. Apply shotcrete to prepared surface	2.1. Prepare backgrounds, cutting out, demolition and keying 2.2. Mix shotcrete 2.3. Assemble and operate shotcreting equipment 2.4. Apply shotcrete 2.5. Remove and reinstate damaged shotcrete material 2.6. Maintain tools and equipment

ELEMENT	PERFORMANCE CRITERIA
3. Contribute to controlling hazards in work area	3.1. Identify hazards in work area 3.2. Assess risks arising from those hazards 3.3. Take appropriate action to control risks to 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:

- observing and monitoring work procedures
- adjusting/correcting/responding to work requirements
- identifying and solving problems
- manual skills
- physical handling skills
- using tools and equipment correctly and safely
- working in a team or individually, as required
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- methods of preparing background surfaces
- types, uses and operation of tools and equipment
- types, uses and operation of shotcreting equipment
- types and characteristics of shotcreting materials
- methods of mixing and applying shotcreting materials
- methods of avoiding lamination of applied shotcreting materials
- methods of protecting applied shotcreting material during application and curing
- types and methods of finishing the surface of the shotcrete
- curing shotcrete
- reasons for, and timing of, dedicated curing and heat-up programs and the consequences of the installed concrete if the program is not correctly followed
- types and uses of temporary support/formwork
- methods of protecting work during installation
- reasons for, and methods of, providing test panels

REQUIRED SKILLS AND KNOWLEDGE

- methods of cutting
- safeguards to take during reinstatement
- methods of removing damaged refractory
- methods of keying and bonding new to existing refractories
- reasons for, and methods of, obtaining seals between new and existing refractory
- materials sources
- materials types/categorisation
- methods of production
- familiarity with installation techniques
- familiarity with principles of selection
- familiarity with variety of applications

Evidence 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

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:

- a uniform coating has been applied
- it adheres appropriately the surface
- it is of the desired thickness and consistency.

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.

EVIDENCE GUIDE	
	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. 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 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
Shotcrete	Shotcrete is the generic term used to describe the placement of cementitious products such as concrete or refractory monolithics, by high volume and high velocity air
Tools and equipment	Tools and equipment include: - mixing equipment - air compressors

RANGE STATEMENT	
	• water addition equipment • gunning equipment/nozzles • equipment allowing access
Installation	Installation includes: • correct thickness of course • correct compaction • conforming to required curves and angles • tying to structure • keying to existing refractory
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		

PMC552095B Prepare for, install and repair ceramic fibre

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the installation of ceramic fibre refractory. It involves interpreting information, following safe work practices, installing and repairing ceramic fibre and using tools and ancillary equipment.

Application of the Unit

Application of the unit	This unit of competency applies to operators who install and/or repair ceramic fibre refractory. Ceramic fibre may be the total requirements for the job, or it may need to join other refractory. 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		

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 the suitability of resources	1.1. Check all information conforms with resources 1.2. Record discrepancies in information 1.3. Report any inaccuracies in information to the person in charge 1.4. Identify and select materials, components, tools and equipment
2. Prepare for and install ceramic fibre	2.1. Prepare backgrounds, cutting out, demolition and keying 2.2. Install extraction equipment 2.3. Weld anchors using automatic stud guns 2.4. Install ceramic fibre and make correct joints 2.5. Repair ceramic fibre
3. Contribute to controlling hazards in work area	3.1. Identify hazards in work area 3.2. Assess risks arising from those hazards 3.3. Take appropriate action to control risks to procedures and duty of care

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

Required skills include:

- observing and monitoring work practices
- adjusting/correcting/responding to work requirements
- identifying and solving problems
- manual skills
- physical handling skills
- using tools and equipment safely
- working in a team or individually, as required
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- types and characteristics of ceramic fibre
- dust hazards and methods of minimising risks
- types and uses of respiratory equipment
- types and uses of extraction devices
- anchorage systems
- methods of welding anchors to background surfaces
- methods of installing and jointing ceramic fibre
- methods of rigidising surface of installed ceramic fibre
- types and uses of temporary support
- methods of protecting work during installation
- safeguards to take during reinstatement work
- methods of removing damaged refractory
- methods of keying, bonding new to existing
- materials sources
- materials types/categorisation
- methods of production
- familiarity with installation techniques
- familiarity with principles of selection
- familiarity with variety of applications

Evidence 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	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: • appropriate attachment of the ceramic fibre is ensured • jointing is correct.
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. 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 language and literacy

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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

Tools and equipment

Tools and equipment include:

- fibre handling equipment
- fibre/other refractory mixing equipment
- lifting and placing equipment
- equipment allowing access

Installation

Installation includes:

- correct thickness
- conforming to required curves and angles
- tying to structure
- keying/interfacing to existing refractory

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		

PMC553000C Set up and tune a process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the setting up and tuning of equipment or a process. It involves preparing equipment, performing routine checks, monitoring operations, making adjustments and dealing with non-routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to operators or technicians who are responsible for setting up a process for operation and making adjustments to ensure it is operating well. The unit includes setting up and tuning equipment for startup, job change and equipment changes in preparation for production. This unit assumes that the person doing the set up has the knowledge and skills to operate the process being set up. This competency is typically performed by an experienced operator, leading hand or supervisor. It does NOT include setting up and tuning processes covered by: • <i>PMC553040C Set up and optimise glass forming process</i> • <i>PMC553041C Set up and optimise glass furnace process</i> • <i>PMC553042C Set up and optimise cutting and stacking process.</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 equipment/change parts installation	1.1. Identify all safety and emergency procedures 1.2. Shut down equipment in accordance with procedures/work instructions and manufacturer's specifications 1.3. Isolate equipment according to procedures/work instructions 1.4. Remove ancillary equipment in accordance with procedures/work instructions and manufacturer's specifications 1.5. Complete records and logs for removal of

ELEMENT	PERFORMANCE CRITERIA
	equipment or change parts
2. Prepare the process for production	2.1. Consult the production schedule to determine the product to be manufactured 2.2. Ensure that the raw materials are available as required 2.3. Ensure that the equipment/change parts, ancillaries and fixtures are available as required 2.4. Perform pre-installment equipment preparation according to procedures/work instructions 2.5. Ensure that the equipment is in a safe condition for use
3. Set up process	3.1. Perform checks and tests to product and equipment specifications 3.2. Ensure alignment of all equipment according to product specifications and procedures/work instructions 3.3. Ensure that process/equipment is set up as required for the production schedule
4. Tune the process	4.1. Monitor operation and compare with standard operating procedures for appropriate operation 4.2. Identify any deviation from standard performance 4.3. Identify the cause of the deviation and take action 4.4. Make adjustments to the equipment settings, process conditions or raw materials to bring production into specification 4.5. Continue monitoring operation and making adjustments until product/equipment is within specification.
5. Respond to problems	5.1. Identify possible routine and non-routine problems in the 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. Report problems outside area of responsibility to designated person
6. Control hazards	6.1. Identify hazards from the job to be done 6.2. Identify other hazards in the work area 6.3. Assess the risks arising from those hazards 6.4. Implement measures to control those risks in line

ELEMENT	PERFORMANCE CRITERIA
	with 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 process conditions and situations that will lead to out of specification production
- implementing the enterprise's procedures and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the operation of the process
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- nature of the product
- setup and tuning of all equipment
- startup and shutdown processes
- construction and limitations of the equipment
- out of specification situations
- quality problems
- distinguish between following causes of problems:
 - raw materials
 - mechanical
 - electrical/instrument

Evidence 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 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: • setup/tuning are completed to specifications and within timeframe • critical process parameters such as temperature and pressures are maintained within limits • quality is monitored to minimise wastage • startup and shutdown occurs first time • signals and alarms are responded to immediately • process measurements are continually made or observed • adjustments made are completed in a timely manner in accordance with work instructions. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this competency 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. 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	This unit may be assessed concurrently with other

EVIDENCE GUIDE	
	relevant units.
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
Manufactured mineral products	Manufactured mineral products may include: • clay and ceramics • concrete • concrete products • ceramic crucibles • cement • fibre cement • plasterboard • ground minerals • other manufactured mineral products processes
Tools and equipment	Tools and equipment may include: • changeover parts and equipment • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Plant data	Plant data may include: • test results

RANGE STATEMENT	
	• instrument/control panel information • data from physical senses (sight, sound and hearing) • temperatures, pressures, material flow and discharge rates and effects • variations to chemical reactions/material modifications
Typical problems include:	Typical problems may include: • raw materials feed • equipment alignment • analysis of all plant data including test results, control instrument data and other observations • control of temperature within specification • product quality • equipment speed • taking corrective action

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC553010C Process raw meal into product

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation and processing (in a large plant) of raw meal through a kiln and distribution of the cement/lime product to storage. It involves conducting pre-start checks, operating and monitoring the process, rectifying operational 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 and processing raw meal into cement and/or lime product. This unit does NOT require the operation of a central control panel. This competency is typically performed by an experienced operator, leading hand or supervisor. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
	PMC552010C	<i>Operate a calcining kiln</i>

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 processing	1.1. Notify/keep informed all relevant people about the current status operations and any intention to make changes 1.2. Perform all pre-start checks in accordance with standard operating procedures 1.3. Set up and configure equipment startup function complying with procedures 1.4. Check plant/equipment settings against operating parameters as identified in standard operating procedures 1.5. Load raw materials in accordance with work instructions 1.6. Start up plant/equipment in accordance with procedures
2. Process raw meal	2.1. Commence/continue process operations in accordance with specified operating procedures 2.2. Monitor and check against target parameters

ELEMENT	PERFORMANCE CRITERIA
	instrument/ control panels for variations, fluctuations or trends 2.3. Maximise throughput of system while meeting quality target parameters 2.4. Check and adjust ancillary equipment as required
3. Distribute product to storage	3.1. Monitor and perform necessary adjustments to discharge rate and temperature as required 3.2. Monitor the distribution transport system for efficiency and spillages and take appropriate action as required 3.3. Monitor the distribution of product to the correct storage area and level of product in that area, and redirect as required
4. Respond to problems	4.1. Identify possible routine and non-routine problems in the equipment or process 4.2. Determine problems needing action 4.3. Determine possible fault 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
5. Shut down equipment	5.1. Ensure line is clear of all product and left ready for startup 5.2. Shut down equipment in accordance with procedures 5.3. Complete appropriate records and logs 5.4. Shut down equipment in an emergency situation
6. Prepare equipment for maintenance	6.1. Isolate equipment in accordance with procedures 6.2. Remove any broken materials safely 6.3. Ensure area is clear and safe for maintenance
7. Control hazards	7.1. Identify hazards in kiln work area 7.2. Assess the risks arising from those hazards 7.3. 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 variance from specifications and standard operating procedures and determining an appropriate action that is consistent with operating guidelines
- 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 the process
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- operation procedures of the kiln and kiln system
- kiln chemistry, chemistry and physics of cement/lime making processes (as appropriate)
- isolation procedures
- operational processes and functions, including startup and shutdown processes
- composition and nature of raw materials and finished product
- construction and limitations of the equipment
- out of specification situations
- material feed, cooling and distribution systems
- distinguish between causes of faults such as:
 - equipment fault
 - variations in raw materials
 - variations in feed rates and preparation
 - kiln quality and optimisation practices
 - types of kiln fuels and reactions
 - acceptable ranges of 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

EVIDENCE GUIDE	
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 process 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: • temperatures are maintained within limits • quality is monitored to minimise wastage • process measurements are continually made or observed. 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	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 processes and techniques must be culturally appropriate and appropriate to the language and literacy

EVIDENCE GUIDE**assessment**

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 operations

Equipment and operations may include:

- instrument panels (local)
- measuring and recording equipment
- communication equipment
- hand tools
- emergency stop buttons and lanyards
- personal protective equipment
- grinding mills
- pneumatic conveying systems
- slurry pumps
- dust collectors
- mixing and blending silos
- vibrating screens
- kilns
- bulk storage silos
- heat recovery systems

Typical problems

Typical problems may include:

- equipment malfunctions
- temperature fluctuations
- quality of product
- material/feed variations
- spillages and leakages
- inaccuracies in blending and proportioning of

RANGE STATEMENT	
	raw materials • out of specification moisture content of raw materials/slurry • variations in temperature, time and cooling rates • variations in feed rates or quantities • vibration
Occupational health and safety (OHS)	The identification and control of hazards and the application of OHS are 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		

PMC553020C Prepare moulds and dies

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the preparation of moulds and dies, and includes the preparation of cases and frames. It involves selecting the necessary tools and materials, making dies to specification and ensuring finished product is to specification.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for preparing cases and frames and making working moulds for specified products. The operator is able to make and check the mould against the procedures or other relevant standards/drawings. This unit of competency covers the making of moulds, models and dies for use in a variety of manufacturing operations, such as: • concrete products • clay products • ceramic products This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic 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. Prepare cases and frames	1.1. Check manufacturing schedule to determine type of mould to be made 1.2. Set up materials for case making to procedure 1.3. Make case to specification 1.4. Check case against requirements
2. Prepare and make working moulds	2.1. Pick the required case/frame 2.2. Make the working mould to procedures 2.3. Remove working mould from the case 2.4. Check, finish and store mould to procedures
3. Prepare dies	3.1. Check manufacturing schedule for type of die needed 3.2. Set up materials for die making to procedure

ELEMENT	PERFORMANCE CRITERIA
	3.3. Make die to specifications 3.4. Remove working die from master die and prepare for use to procedure
4. Respond to problems	4.1. Identify possible routine and non-routine problems in the equipment or process 4.2. Determine problems needing action 4.3. Determine possible fault causes 4.4. Rectify problem using appropriate solution within area of responsibility 4.5. Report problems outside area of responsibility to designated person
5. Control hazards	5.1. Identify hazards from the job to be done 5.2. Identify other hazards in the work area 5.3. Assess the risks arising from those hazards 5.4. Implement measures to control those risks in line with 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 situations which could cause production problems and taking appropriate action
- implementing enterprise's procedures and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the operation of moulds and dies
- using and maintaining all required materials, tools and parts
- diagnosing and solving problems involved in the work
- achieving specified quality standards
- communicating effectively with team members, management and other departments
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge includes:

- characteristics of different materials
- requirements from drawings, specifications or job sheets
- underlying causes of faults such as precipitated by:
 - materials
 - dimensions
 - allowance for shrinkage
 - damage to components

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- OHS requirements are met
- quality improvement techniques are applied
- emergency procedures are understood and applied
- waste is minimised.

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

EVIDENCE GUIDE	
	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
Materials	Materials may include: • additives • body materials • epoxy resins • metal strapping • plaster • plastic • release agents • rubber • slip • timber • water
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

RANGE STATEMENT

	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		

PMC553021C Set up and tune glazing equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the setting up and tuning of glaze application equipment or process. It involves conducting pre-start checks, monitoring operations, making necessary adjustments and dealing with non-routine problems.

Application of the Unit

Application of the unit	This unit of competency applies to experienced operators, leading hands or supervisors who are responsible for setting up and adjusting glazing equipment from the requirements as set out in production schedules and specifications. The operator is able to run trials and adjust all of the equipment settings to have the production equipment perform satisfactorily.

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 glazing equipment setup	1.1. Identify all safety and emergency procedures 1.2. Shut down equipment to procedures and manufacturer's specifications 1.3. Isolate equipment in accordance with procedures 1.4. Remove ancillary equipment to procedures and manufacturer's specifications 1.5. Complete records and logs for setup of equipment or changing of parts
2. Prepare the process for production	2.1. Consult the production schedule to determine the product to be manufactured 2.2. Ensure availability of raw materials as required 2.3. Identify and provide equipment/change parts, ancillaries and fixtures in accordance with production schedule 2.4. Perform equipment preparation to procedures 2.5. Monitor equipment condition and take corrective action if equipment is in an unsafe condition
3. Set up process	3.1. Perform checks and tests to product and equipment specifications 3.2. Align all equipment to product specifications and procedures 3.3. Set up process/equipment as required for the

ELEMENT	PERFORMANCE CRITERIA
	production schedule
4. Tune the process	4.1. Monitor operation and compare with procedures for appropriate operation 4.2. Identify any deviation from standard performance 4.3. Identify the cause of the deviation and take action 4.4. Make adjustments to the equipment settings, process conditions or raw materials to bring production into specification 4.5. Continue monitoring operation and making adjustments until product/equipment is within specification
5. Respond to problems	5.1. Identify possible routine and non-routine problems in the 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. Report problems outside area of responsibility to designated person
6. Control hazards	6.1. Identify hazards from the job to be done 6.2. Identify other hazards in the work area 6.3. Assess the risks arising from those hazards 6.4. Implement measures to control those risks in line with 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 process conditions and situations that 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 process

REQUIRED SKILLS AND KNOWLEDGE

- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- glaze properties and composition
- product properties and requirements for glazing
- glaze application faults
- quality problems
- construction and limitations of the equipment
- setup and tuning of all equipment
- startup and shutdown processes
- glaze is application and specifications
- waste minimisation techniques
- process measurements required and their purpose
- adjustments required and permissible to equipment or process to remain within specifications
- distinguish between following causes of problems:
 - raw materials, including glaze and product
 - set up and tuning
 - mechanical
 - electrical/instrument

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- setup/tuning are completed to specifications and

EVIDENCE GUIDE	
	within timeframe • glaze application parameters are maintained within limits • glaze is applied to specification • quality is monitored to minimise wastage • startup and shutdown occur first time • signals and alarms are responded to immediately • process measurements are continually made or observed • adjustments made are completed in a timely manner to procedures. 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. 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

RANGE STATEMENT	
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
Application of equipment	This unit includes equipment for application of glazes to ceramic or clay products, including: • automatic spray lines • robotic spray equipment • automatic dipping lines • PLCs, but not control panels
Tools and equipment	Tools and equipment may include: • changeover parts and equipment • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Process	Process includes: • setting up and tuning equipment for startup, job change and equipment changes in preparation for production
Typical problems	Typical problems may include: • product feed to and from process • glaze composition and properties • equipment alignment • analysis of all plant data • product quality • equipment speed • taking corrective action
Plant data	Plant data may include: • test results • instrument/control panel information • data from physical senses (sight, sound and hearing) • temperatures, pressures, material flow and

RANGE STATEMENT	
	discharge rates and effects • variations to glaze composition or behaviour
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		

PMC553040C Set up and optimise glass forming process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the setting up and tuning of the glass forming process including technical fault finding and non-routine problem solving, emergency recovery, optimising the process to gain maximum yield, and detailed knowledge of forming process.

Application of the Unit

Application of the unit	This unit of competency applies to experienced operators, leading hands or supervisors who are responsible for setting up and adjusting the glass forming process from the requirements as set out in production schedules and specifications. The operator is able to run trials and adjust all of the equipment settings to have the production equipment perform satisfactorily. This unit does NOT apply to the set up and optimisation of secondary glass furnace processes, which is covered by <i>PMC553041C Set up and optimise glass furnace process</i>. Typically an operator would: • set up, monitor and tune equipment for optimum performance • identify and rectify routine and non-routine operational problems • adjust and optimise processes to gain maximum yield • undertake detailed quality measurements and inspections • implement emergency recovery • undertake housekeeping • complete records and logs. 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 for equipment installation	1.1. Determine the product to be manufactured 1.2. Ensure that the equipment change parts, ancillaries and fixtures are available as required

ELEMENT	PERFORMANCE CRITERIA
	1.3. Perform pre-installment equipment preparation according to procedures 1.4. Ensure that the equipment is in a safe condition for use
2. Remove current equipment and/or tooling	2.1. Identify and implement all safety and emergency procedures 2.2. Shut down equipment in accordance with procedures. 2.3. Isolate equipment as per procedures 2.4. Remove ancillary equipment in accordance with procedures 2.5. Complete records and logs for removal of current equipment
3. Install and setup new equipment and/or tooling	3.1. Perform required checks and tests prior to installation 3.2. Identify any faults in equipment/tooling and take appropriate action 3.3. Install and set up appropriate ancillary equipment in accordance with procedures 3.4. Set up equipment/tooling as required 3.5. Monitor and adjust until production is as required
4. Monitor, interpret data and adjust operation	4.1. Monitor process data 4.2. Ensure forming equipment startup function complies with work instructions 4.3. Operate glass forming equipment in accordance with procedures 4.4. Monitor plant and process and deduce conditions of materials in process and products being made 4.5. Take appropriate action to improve process operation 4.6. Check that process operation has improved 4.7. Monitor and adjust until production is as required
5. Sample test and record product data	5.1. Sample as required by the product and in line with enterprise requirements 5.2. Complete appropriate test to enterprise and client requirements 5.3. Identify variations from process parameters and take appropriate action 5.4. Measure/graph and record operating parameters, according to enterprise requirements 5.5. Record test results as required by procedures

ELEMENT	PERFORMANCE CRITERIA
6. Rectify equipment and quality problems	6.1. Identify the range of equipment and quality faults that can occur during the operation 6.2. Diagnose possible causes of equipment and quality faults 6.3. Rectify cause of equipment failure and quality faults by established enterprise procedures 6.4. Identify and rectify equipment failure causes in accordance with established enterprise procedures 6.5. Ensure appropriate records and logs of equipment operations are maintained to meet enterprise requirements 6.6. Identify non-routine problems and report to designated person
7. Shut down equipment	7.1. Shut down equipment in accordance with procedures 7.2. Complete appropriate records and logs 7.3. Shut down equipment in an emergency situation
8. Prepare equipment for maintenance	8.1. Isolate equipment in accordance with work instructions 8.2. Make sure area is clear and safe for maintenance 8.3. Complete all records and logs
9. Control hazards	9.1. Identify hazards from the job to be done 9.2. Identify other hazards in the work area 9.3. Assess the risks arising from those hazards 9.4. Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production
- implementing the enterprise's standard procedures and work instructions and relevant regulatory requirements in a manner relevant to the operation of the process

REQUIRED SKILLS AND KNOWLEDGE

- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- setup and tuning of all equipment
- startup and shutdown processes
- optimisation of process for yield maximisation
- energy utilisation
- importance of atmospheric conditions and effect on process
- construction and limitations of the equipment
- out of specification situations
- quality problems
- distinguish between causes of problems, such as:
 - raw materials
 - mould equipment
 - variables
 - mechanical and thermal
 - electrical/instrument
 - atmospheric

Evidence 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 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 trouble

EVIDENCE GUIDE

	rather than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • setup/tuning is completed to specifications • temperature and pressures are maintained within limits • adjustments made are completed in a timely manner in accordance with procedures/work instructions • quality is monitored to minimise wastage • startup and shutdown occur first time • early warning signs of equipment/processes needing attention or potential problems are recognised and dealt with in a timely manner • process measurements are continually made or observed • the range of possible causes can be identified and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems to related plant 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 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

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 and work instructions
Product to be made	The product to be made may be determined by consulting the production schedule or similar means
Required setup	Required setup includes: • alignment of all equipment • checks and adjustments according to product specifications and procedures • production schedule requirements
Monitoring	Monitoring includes analysing and interpreting data for: • variations • fluctuations • trends with a view to establishing stable, efficient operation producing goods as required
Process data	Process data include that from:

RANGE STATEMENT	
	• equipment • instruments • control panels • test results
Appropriate action	Appropriate action includes adjusting: • temperature controls • equipments settings • process conditions to ensure process parameters are maintained to job specifications
Records	Records may be in: • hard copy • electronic form
Application of equipment:	This unit includes equipment applicable to forming glass in each of the specific areas of glass products manufacture: • flat glass • insulation, glass wool insulation, laminated blankets, roll and boards • fibreglass and glass filaments • packaging, bottles and jars
Tools and equipment	Tools and equipment may include: • forming and associated equipment such as: • bushings • finshields • applicators • shoe and winder assemblies • spinners • lapping equipment • process water • lehr • furnace • forehearth • bath • fiberisers • computers • measuring and recording equipment

RANGE STATEMENT	
	• communication equipment • hand tools • safety clothing and equipment
Process	The process includes: • setting up, monitoring and tuning equipment for optimum performance especially during startup, job change and equipment changes
Typical problems	Typical problems may include: • raw materials supply • equipment alignment • analysis of all plant data • control of temperature within specification • product quality • equipment speed • taking corrective action
Plant data	Plant data may include: • test results • instrument/control panel information • data from physical senses (sight, sound and hearing) • temperatures, pressures, material flow and discharge rates and effects • variations to chemical reactions/material modifications
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		

PMC553041C Set up and optimise glass furnace process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers implementing furnace changeover and monitoring and optimising the forming of flat glass, including the rectification of equipment and quality problems.

Application of the Unit

Application of the unit	This unit of competency applies to experienced operators, leading hands or supervisors who are responsible for setting up and adjusting glass furnaces from the requirements as set out in production schedules and specifications. The operator is able to run trials and adjust all of the equipment settings to have the production equipment perform satisfactorily. This unit does NOT apply to the set up and optimisation of primary glass furnace processes, which is covered by <i>PMC553040C Set up and optimise glass forming process</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 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. Remove current equipment and/or tooling	1.1. Identify all safety and emergency procedures 1.2. Shut down furnace and ancillary equipment in accordance with work instructions and manufacturer's specifications 1.3. Conduct tests and checks on equipment/tooling prior to removal in accordance with work instructions 1.4. Remove current equipment/tooling in accordance with work instructions and manufacturer's specifications 1.5. Complete records and logs for removal
2. Install and set up new equipment and/or tooling	2.1. Perform checks and tests prior to installation 2.2. Identify any faults in equipment/tooling and take appropriate action

ELEMENT	PERFORMANCE CRITERIA
	2.3. Install and set up appropriate equipment/tooling for new production process in accordance with work instructions 2.4. Ensure alignment of all equipment and perform checks according to product specifications and work instructions 2.5. Ensure setup and configuration of equipment for startup complies with work instructions 2.6. Perform checks and tests to product and equipment in accordance with work instructions
3. Monitor, interpret data and adjust operation	3.1. Ensure forming equipment start up function complies with work instructions 3.2. Ensure glass forming equipment is operated in accordance with work instructions 3.3. Monitor instruments and control panels, and interpret test results for fluctuations, variations and trends 3.4. Monitor plant and process and deduce conditions of materials in process and products being made 3.5. Determine appropriate action to improve process operation 3.6. Adjust furnace controls to ensure glass parameters are maintained to job specifications 3.7. Check that process operation has improved 3.8. Continue analysing data and making adjustments until desired level of process operation is achieved and product is within specifications in accordance with work instructions
4. Sample, test and record product data	4.1. Carry out sampling procedures appropriate to the product and the test in line with enterprise requirements 4.2. Complete appropriate test to enterprise and client requirements 4.3. Identify variations from process parameters and take appropriate action 4.4. Measure/graph and record operating parameters, according to enterprise requirements 4.5. Record test results in hard or electronic form as required by standard procedures and work instructions
5. Rectify equipment and quality problems	5.1. Identify the range of equipment and quality faults that can occur during the operation

ELEMENT	PERFORMANCE CRITERIA
	5.2. Diagnose possible causes of equipment and quality faults 5.3. Rectify cause of equipment failure and quality faults by established enterprise procedures 5.4. Identify and rectify equipment failure causes in accordance with established enterprise procedures 5.5. Ensure appropriate records and log books of equipment operations are maintained to meet enterprise requirements 5.6. Identify non-routine problems and report to designated person
6. Shut down equipment	6.1. Shut down equipment in accordance with work instructions 6.2. Complete appropriate records and logs 6.3. Shut down equipment in an emergency situation
7. Prepare equipment for maintenance	7.1. Isolate equipment in accordance with work instructions 7.2. Ensure area is clear and safe for maintenance 7.3. Complete all records and logs
8. Control hazards	8.1. Identify hazards from the job to be done 8.2. Identify other hazards in the work area 8.3. Assess the risks arising from those hazards 8.4. Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production
- implementing the enterprise's standard procedures and work instructions and relevant regulatory requirements in a manner relevant to the operation of the process
- reading and numeracy to interpret workplace documents and technical information

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- setup/changeover of all equipment/tooling
- startup and shutdown processes
- optimisation of process for yield maximisation
- construction and limitations of the equipment
- out of specification situations
- quality problems such as:
 - poor optics
 - excessive breakage
 - non-uniform break pattern
 - incorrect cross bend
 - excessive bow
 - scratches
 - poor glass shape
- distinguish between causes of problems, such as:
 - raw material
 - mechanical
 - electrical/instrument

Evidence 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 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

EVIDENCE GUIDE

	emphasis should be on the ability to stay out of trouble than on recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • setup/tuning are completed to specifications • temperature and pressures are maintained within limits • quality is monitored to minimise wastage • startup and shutdown occur first time • early warning signs of equipment/processes needing attention or potential problems are recognised and dealt with in a timely manner • process measurements are continually made or observed • the range of possible causes can be identified and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems to related plant 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 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**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

Application of equipment

This unit includes equipment applicable to formed glass manufacture, such as:

- equipment/tooling which may include:
 - mould
 - lift jet array
 - quench ring
 - press ring
 - tile
- other production equipment:
 - forming and conditioning equipment
 - computers
 - measuring recording equipment
 - communication equipment
 - hand tools

Types of changeovers

Types of changeovers may include:

- deep bend to deep bend or deep bend to quick sag
- quick sag to quick sag
- advanced press bend to advanced or conventional press bend
- conventional press bend to conventional press

RANGE STATEMENT	
	bend It does NOT include processes involved with: - melting furnaces used in glass production (primary source) - scientific glass
Typical problems	Typical problems may include: - temperature and pressure problems - equipment problems - quality problems
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		

PMC553042C Set up and optimise secondary process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the setup, monitoring and tuning of equipment or process to optimise performance, including the rectification of non-routine equipment and quality problems.

Application of the Unit

Application of the unit	This unit of competency applies to experienced operators, leading hands or supervisors who are responsible for setting up and adjusting glass secondary processes from the requirements as set out in production schedules and specifications. The operator is able to run trials and adjust all of the equipment settings to have the production equipment perform satisfactorily. This unit does NOT apply to the set up and optimisation of primary glass furnace processes, which is covered by <i>PMC553040C Set up and optimise glass forming process</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 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 the process for production	1.1. Identify all safety and emergency procedures 1.2. Shut down all equipment in accordance with work instructions and manufacturer's specifications 1.3. Consult the production schedule to determine the product to be manufactured 1.4. Ensure that the raw materials are available as required 1.5. Ensure that the equipment change parts, ancillaries and fixtures are available as required 1.6. Complete records and logs for setup of fabrication equipment
2. Set up fabrication process	2.1. Perform checks and tests to product and equipment specifications

ELEMENT	PERFORMANCE CRITERIA
	2.2.Ensure alignment of all equipment by performing checks and adjustments according to product specifications/work instructions 2.3.Ensure that process and equipment are setup as required for the production schedule 2.4.Ensure that the equipment is in a safe condition for use
3. Monitor, interpret data and adjust operation	3.1.Monitor instruments and control panels, and interpret test results for fluctuations, variations and trends 3.2.Monitor plant and process and deduce conditions of materials in process and products being made 3.3.Determine appropriate action to improve process operation 3.4.Adjust controls to ensure glass parameters are maintained to job specifications 3.5.Check that process operation has improved 3.6.Continue analysing data and making adjustments until desired level of process operation is achieved and product is within specifications in accordance with work instructions
4. Sample, test and record product data	4.1.Carry out sampling procedures appropriate to the product and the test in line with enterprise requirements 4.2.Complete appropriate test to enterprise and client requirements 4.3.Measure/graph and record operating parameters according to enterprise requirements 4.4.Record test results in hard or electronic form as required by standard procedures and work instructions
5. Rectify equipment and quality problems	5.1.Identify the range of equipment and quality faults that can occur during the operation 5.2.Determine and rectify equipment and quality faults causes in accordance with established enterprise procedures 5.3.Identify and rectify equipment failure causes in accordance with established enterprise procedures 5.4.Ensure appropriate records and log books of equipment operations are maintained to meet enterprise requirements 5.5.Identify non-routine problems and rectify within area

ELEMENT	PERFORMANCE CRITERIA
	of responsibility 5.6. Report problems outside area of responsibility to designated person
6. Shut down equipment	6.1. Shut down equipment in accordance with work instructions 6.2. Complete appropriate records and logs 6.3. Shut down equipment in an emergency situation
7. Control hazards	7.1. Identify hazards from the job to be done 7.2. Identify other hazards in the work area 7.3. Assess the risks arising from those hazards 7.4. Implement measures to control those risks in line with 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 process conditions which will lead to out of specification production
- implementing the enterprise's standard procedures and work instructions and relevant regulatory requirements in a manner relevant to the operation of the process
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the glass
- setup/changeover and tuning of all equipment
- startup and shutdown processes
- optimisation of process for yield maximisation
- construction and limitations of the equipment
- out of specification situations
- quality problems such as:
 - poor optics

REQUIRED SKILLS AND KNOWLEDGE

- excessive breakage
- non-uniform break pattern
- incorrect cross bend
- excessive bow
- scratches
- poor glass shape
- distinguish between causes of problems, such as:
 - raw material
 - mechanical
 - electrical/instrument

Evidence 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 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 trouble than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- setup/changeover/tuning are completed to specifications
- temperature and pressures are maintained within limits
- quality is monitored to minimise wastage
- startup and shutdown occur first time
- early warning signs of equipment/processes needing

EVIDENCE GUIDE	
	attention or potential problems are recognised and dealt with in a timely manner • process measurements are continually made or observed • adjustments are completed in a timely manner • the range of possible causes can be identified and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems to related plant 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 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. 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 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
Application of equipment	This unit includes equipment applicable to each of the specific areas of glass products manufacture: • flat glass • insulation, glass wool insulation, laminated blankets, roll and boards • fibreglass and glass filaments • packaging, bottles and jars
Tools and equipment	Tools and equipment may include: • secondary process/finishing and associated equipment such as: • CSM line equipment • rovings equipment • robot packer • edge trimmer • choppers • on-line cutting equipment • on-line stacking equipment • curing oven • facing equipment • computers • measuring recording equipment • communication equipment • hand tools • safety clothing and equipment
Process	The process includes: • setting up, monitoring and tuning equipment for optimum performance especially during startup, job change and equipment changes

RANGE STATEMENT	
	It does NOT include processes involved with: • scientific glass manufacture • primary manufacturing processes
Typical problems	Typical problems may include: • raw materials supply • equipment alignment • analysis of all plant data • product quality • equipment problems
Plant data	Plant data may include: • test results • instrument/control panel information • data from physical senses (sight, sound and hearing) • temperatures, pressures, material flow and discharge rates and effects • variations to chemical reactions/material modifications
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		

PMC553050C Produce architectural precast concrete

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the production of architectural precast concrete products. It involves preparing the mould and reinforcement, selecting the necessary tools and materials and ensuring finished product is to specification.

Application of the Unit

Application of the unit	This unit of competency applies to operators in a concrete plant who are responsible for producing precast architectural concrete components. It includes the operation of all ancillary equipment. It includes reinforcement (not prestressed) and the operation of casting and vibrating equipment. The product will generally require finishing and/or veneering once cured. This unit of competency includes: • placement of reinforcing • compaction using vibrating tables and immersion vibrators as appropriate to the enterprise • curing by water, steam, membrane or other heat sources as appropriate to the enterprise • preparation for (a selected range of) finishing techniques including water washing, retarding, sandblasting, off-form, acid etching, bush hammering, honing, polishing and glass reinforced concrete (GRC). This competency is typically performed by an experienced operator, leading hand or supervisor working under the supervision of a principal contractor and architect.

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 mould for casting	1.1. Check casting schedule, drawings and job specification 1.2. Check finish and veneer requirements for any or all faces, edges or surfaces 1.3. Prepare veneering equipment and formwork to temporarily support veneers and backing concrete
2. Prepare reinforcement	2.1. Check quantities, type, size and shape of reinforcement supplied against drawings and schedules 2.2. Place reinforcement and check concrete covers 2.3. Complete mould assembly 2.4. Insert lifting devices, lugs, fixing and other fittings according to drawings and specifications

ELEMENT	PERFORMANCE CRITERIA
	2.5. Seal mould
3. Cast concrete	3.1. Ensure that concretes are poured in correct sequence according to work schedule 3.2. Ensure adequate vibration 3.3. Complete casting process to plans and specification 3.4. Prepare test samples/cylinder as required by work instructions 3.5. Screed to a flat, accurate surface in preparation for finishing 3.6. Finish green concrete as required 3.7. Wet patch as required
4. Cure product	4.1. Cover and cure mould in accordance with standard procedure and any special requirements 4.2. Monitor curing to achieve specified stripping strength
5. Strip and store product	5.1. Remove mould parts at appropriate time, with care, and inspect for damage 5.2. Lift unit using appropriate lifting equipment and lifting methods 5.3. Use good occupational health and safety (OHS) practice 5.4. Arrange storage using protective pads to ensure against damage
6. Respond to problems	6.1. Identify possible routine and non-routine problems in the 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 6.5. Report problems outside area of responsibility to designated person
7. Control hazards	7.1. Identify hazards from the job to be done 7.2. Identify other hazards in the work area 7.3. Assess the risks arising from those hazards 7.4. Implement measures to control those risks in line with 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 and taking appropriate action
- 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:

- principles of concrete mixing (if mixed by operator)
- principles of veneer adhesion
- principles of concrete finishing
- causes of mould wear
- results of using worn moulds
- problems resulting from mould leakage
- reading steel plans
- predicting final shape/dimension based on bar size/type and bend radius
- principles of reinforcing concrete to specification
- principles of fitting accessories to specification
- principles of concrete product finishing
- reinforcing materials
- design factors
- fabrication methodologies
- effect of water-cement ratio on product
- importance of vibration on compaction
- required concrete cover of reinforcing
- concrete sampling and testing procedures
- non-conformance procedures
- underlying causes of faults such as precipitated by:
 - material inconsistencies
 - mixing irregularities
 - application

REQUIRED SKILLS AND KNOWLEDGE

- finishing difficulties concrete
- mould anomalies
- casting/operating conditions
- concrete mix variations
- vibration
- aggregate size
- reinforcing design/placement
- setting/curing time/rate

Evidence 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 process be understood and that the importance of critical material properties and design characteristics 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:

- products are made consistently in minimum time and with minimum patching
- finishing is within specification/example
- good OHS practice is used consistently.

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

EVIDENCE GUIDE	
	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. Prerequisite units may be co-assessed if appropriate.
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
Typical problems	Typical problems may include: • compact product with tight bends/clearances • loss of fluids (concrete leakage) • adjustment to take account of variables such as weather • variations in cement/water ratio • backing concrete penetrating veneers

RANGE STATEMENT	
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		

PMC553051B Produce structural precast concrete

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the production of structural precast and prestressed concrete products such as beams and girders. It involves preparing the mould and assembling the reinforcing, ensuring quality of concrete, monitoring the process and removing the work piece from the mould.

Application of the Unit

Application of the unit	This unit of competency applies to operators in a concrete plant who are responsible for producing precast structural concrete components for a variety of structural uses. This competency includes the operation of all ancillary equipment. It includes reinforcement preparation, and the operation of casting and vibrating equipment. Reinforcement and vibration at this level of competency may be quite complex (e.g. formwork techniques, deflected strands, jig reinforcement, end block reinforcement). This unit of competency includes: • placement of reinforcing, placement and stressing of strands • compaction using form vibrators, vibrating tables and immersion vibrators as appropriate to the enterprise • curing by water, steam, membrane or other heat sources as appropriate to the enterprise • specialised formwork techniques which could involve polystyrene blocks to lighten heavy products • deflected strands • jiggling reinforcement • end block reinforcement

	welding. This competency is typically performed by an experienced operator, leading hand or supervisor, and would generally involve engineer consultation.

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 mould for casting	1.1. Check casting schedule and job specification 1.2. Clean and oil moulds according to requirements 1.3. Check for mould damage and repair as necessary
2. Assemble reinforcement cage	2.1. Lift preassembled reinforcing sections into mould using good occupational health and safety (OHS)

ELEMENT	PERFORMANCE CRITERIA
	practice 2.2. Assemble additional steel to complete cage to drawings and job specification 2.3. Fit additional items, such as base plates, tie plates and lifting devices, according to work instructions 2.4. Fit hold-ups and hold-downs as appropriate 2.5. Place voids or ducts according to work specifications 2.6. Run prestressing strands through reinforcing cages as required 2.7. Set up guards and comply with OHS requirements for stressing 2.8. Tension strands to extension dimensions and/or gauge readings according to works or engineer instructions 2.9. Recheck reinforcing cage is in correct position and adjust as necessary
3. Close mould and test vibrators	3.1. Lift mould sides and additional parts into position and secure to specification 3.2. Fit any additional items as required 3.3. Seal mould 3.4. Fit vibrators to start positions 3.5. Test run before casting commences
4. Pour concrete	4.1. Begin casting in accordance with work instructions 4.2. Move vibrators and time vibration as required 4.3. Screed top surface flat in preparation for final finish if required 4.4. Patch product as required 4.5. Clean mould and worksite in accordance with OHS requirements
5. Control concrete quality	5.1. Test raw materials as required 5.2. Prepare test cylinders and samples as required 5.3. Monitor and control concrete mix to keep within specifications 5.4. Update all records and file all records and supplier certificates in appropriate place 5.5. Raise non-conformance reports as required
6. Cure product	6.1. Cover and cure mould and test cylinders in accordance with standard procedures and work instructions

ELEMENT	PERFORMANCE CRITERIA
	6.2. Monitor curing to achieve specified stripping strength
7. Strip and store product	7.1. Test samples to ensure specific strength has been achieved 7.2. Remove mould sides and store ready for cleaning 7.3. If applicable, de-stress in accordance with work procedures and sequences 7.4. Ensure unit is lifted according to work instructions and moved to store, supported only on points designated on the drawings
8. Respond to problems	8.1. Identify possible routine and non-routine problems in the equipment or process 8.2. Determine problems needing action 8.3. Determine possible fault causes 8.4. Rectify problem using appropriate solution within area of responsibility 8.5. Report problems outside area of responsibility to designated person
9. Control hazards	9.1. Identify hazards from the job to be done 9.2. Identify other hazards in the work area 9.3. Assess the risks arising from those hazards 9.4. Implement measures to control those risks in line with 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 and taking appropriate action
- 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

REQUIRED SKILLS AND KNOWLEDGE

- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- principles of concrete mixing (if mixed by operator)
- principles of veneer adhesion
- principles of concrete finishing
- causes of mould wear
- results of using worn moulds
- problems resulting from mould leakage
- reading steel plans
- predicting final shape/dimension based on bar size/type and bend radius
- principles of reinforcing concrete to specification
- principles of fitting accessories to specification
- principles of concrete product finishing
- reinforcing materials
- design factors
- fabrication methodologies
- effect of water-cement ratio on product
- importance of vibration on compaction
- required concrete cover of reinforcing
- hazards from critical stages of prestressing reinforcement (placement, stressing, de-stressing, cutting, etc)
- concrete sampling and testing procedures
- non-conformance procedures
- underlying causes of faults such as precipitated by:
 - material inconsistencies
 - mixing irregularities
 - application
 - finishing difficulties concrete
 - mould anomalies
 - casting/operating conditions
 - concrete mixture errors
 - vibration
 - aggregate size
 - reinforcing design/placement
 - setting/curing time/rate

Evidence 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 process be understood and that the importance of critical material properties and design characteristics 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: • products are made consistently in minimum time and with minimum patching • finishing is within specification/example • good OHS practice is used consistently. 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 processes and techniques must be culturally

EVIDENCE GUIDE**assessment**

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

Typical problems

Typical problems may include:

- slippage, breaking of tensioned strands
- mould leakage
- compaction in areas with high reinforcement content (end blocks and haunches)
- compact product with tight bends/clearances
- polystyrene blocks (which may be used in formwork to lighten products) may float to surface on vibration
- polystyrene blocks may move sideways undetected, reducing wall thickness
- adjustment to take account of variables such as weather
- variations in cement/water ratio

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		

PMC553070B Design and construct moulds for fibrous plaster products

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the design and construction of moulds for fibrous plaster products. It involves creating an image of the product to be produced, converting the image to an imagined negatively shaped mould cavity, selecting and mounting material for mould construction and ensuring mould meets requirements.

Application of the Unit

Application of the unit	This unit of competency applies to plaster modellers who are responsible for designing from scratch by intuitive means or determining, either from an existing shape or product, the shape of a product to be created in fibrous plaster. The modeller then, by a process of hand carving, creates a negatively shaped mould impression from which a positively shaped fibrous plaster impression would be created. This competency is typically performed by an experienced modeler, leading hand or supervisor.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	

Prerequisite units		
	<i>PMC552024C</i>	<i>Hand mould products</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. Develop mould design	1.1. Establish original product concept or design from drawings, originals or consultation with the customer 1.2. Sketch out product prototype design and establish product sizes making appropriate allowance for material shrinkage 1.3. Identify areas where undercuts, cutbacks or other special features are required 1.4. Determine parting line 1.5. Determine material from which mould is to be made
2. Select mould material and prepare for mould production	2.1. Set up material for mould making, ensuring that the mould can be handled or moved without damage 2.2. Establish datum point and mark out design dimensions using geometric and lineal calculations 2.3. Determine correct cavity depths and contours 2.4. Ensure there is adequate ventilation and light to

ELEMENT	PERFORMANCE CRITERIA
	facilitate an appropriate work environment
3. Produce working mould	3.1. Fit appropriate protective equipment to prevent inhalation or irritation of by-products of the mould making process 3.2. Use appropriate tools to carve out mould cavity and detail 3.3. Accurately follow the design detail to produce a mould cavity to specification 3.4. Avoid undercuts which will prevent removal of the plaster product from the mould 3.5. Ensure appropriate degrees of taper are provided to facilitate product removal 3.6. Carve reliefs according to design and remove debris as the work proceeds
4. Complete mould	4.1. Clean down completed mould and clean up work area 4.2. Inspect mould surface for defects or irregularities 4.3. Compare design details with mould cavity to confirm accuracy of translation 4.4. Coat mould surface to preserve finish and allow to dry
5. Produce product prototype	5.1. Apply slipping agent to mould surface 5.2. Prepare and insert anchors or ties 5.3. Prepare plaster mixture and appropriate amount of glass fibre 5.4. Cast plaster mix and fibre into mould cavity, strike off and allow to set 5.5. Remove prototype from mould or mould from prototype 5.6. Check prototype for dimensional and detail accuracy 5.7. Compare prototype and mould to identify any faults or mould inaccuracies 5.8. Adjust or dress mould to remove imperfections and clean mould surface 5.9. Cast second prototype and recheck product and mould 5.10. Clean up mould and mark in accordance with organisation identification practice
6. Control hazards	6.1. Identify hazards in modelling work area 6.2. Assess the risks arising from those hazards

ELEMENT	PERFORMANCE CRITERIA
	6.3. Implement measures to control those risks in line with procedures and duty of care
7. Respond to problems	7.1. Identify possible routine and non-routine problems in the 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. Report problems outside area of responsibility to designated person

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- using and maintaining all required materials, tools and parts
- recognising situations which could cause production problems and taking appropriate action
- implementing enterprise's procedures and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the operation of moulds and dies
- diagnosing and solving problems involved in the work
- communicating effectively with team members, management and other departments
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- specified quality standards
- characteristics of different materials
- requirements from drawings, specifications or job sheets
- distinguish between causes of faults such as:
 - materials faults
 - dimensional inaccuracies

REQUIRED SKILLS AND KNOWLEDGE

- inappropriate allowance for material shrinkage
- damage to components

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- OHS requirements are met
- quality improvement techniques are applied
- emergency procedures are understood and applied
- waste is minimised.

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**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

Moulds

Moulds may be manufactured from:

- plaster
- timber
- rubber
- metal
- a combination of these

Materials

Materials may include:

- additives
- body materials
- epoxy resins
- metal strapping
- plaster
- release agents
- rubber
- timber
- water

Equipment

Equipment may include:

- moulds
- chisels and hand held cutting tools
- hand and power tools

RANGE STATEMENT	
	• jigs and fixtures • personal safety equipment • mixing equipment • models • weighing equipment
Typical problems	Typical problems may include: • personal injuries • complexities of mould design and shape • lack of appropriate illumination
Occupational health and safety (OHS)	The identification and control of hazards and the application of OHS are 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		

PMC553072B Model fibrous plaster products

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge required to make a model of a final fibrous plaster product which may be used as a prototype or as a basis for the later production of the item.

Application of the Unit

Application of the unit	This unit of competency applies to plaster modellers who are responsible for producing from, sections, samples or designs, a variety of specialty fibrous plaster products which may include non-standard geometric shapes, architectural renovation, restoration and/or replication of existing features. This competency is generally performed by an experienced modeller or a trainee modeller under supervision.

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 work piece to be produced	1.1. Discuss required attributes of the work piece with supervisor or as appropriate the client 1.2. Determine dimensions and geometry of the work piece 1.3. Identify the profile, pattern and specific features required to be replicated 1.4. Establish and/or plan fixing or anchoring points and the best way to facilitate this in the work piece 1.5. Plan the production method and determine materials and equipment needs.
2. Set up work area and equipment	2.1. Establish work area including anchor points for slides or screeds as necessary 2.2. Develop templates required to produce the work piece 2.3. Mark out the correct dimensions and work piece geometry and check against templates or slide radii 2.4. Establish and position any support materials required to develop and sustain the work piece during production 2.5. Position any lifting or anchoring materials and check that these do not inhibit templates or screeds

ELEMENT	PERFORMANCE CRITERIA
	2.6. Test the functionality of the slides and ensure that all parts of the proposed work piece can be accessed
3. Generate profile of required work piece	3.1. Produce a segment of the desired profile and ensure that this matches the requirements of the original design 3.2. Mount the sample to facilitate replication or to produce appropriate surface detail on the work piece 3.3. Lubricate the sample for replication and the supporting work plate to facilitate ease of stripping of the completed work piece
4. Produce work piece	4.1. Set up the supporting material in a manner which avoids interference with the screed or template 4.2. Prepare plaster mix and ensure fibre strand is available 4.3. Build up rough outline of the work piece adding fibre as the process proceeds 4.4. Form up the desired shape by moving the sample, template or mould to facilitate development of the desired profile or by screeding off 4.5. Build in anchor points or reinforcing at desired positions as the work proceeds 4.6. Hollow out the work piece to minimise the mass of the object, as appropriate 4.7. Check the profile to ensure compliance with the desired product 4.8. Check the work piece for dimensional accuracy
5. Strip and inspect completed work piece	5.1. Remove any external supports from the work piece after the plaster has dried 5.2. Dismantle slides if used 5.3. Clean and put away tools and fitments used in the production process 5.4. Remove the work piece and inspect for errors, damage or porosity 5.5. Clean up any excrescences and remove any waste material 5.6. Coat the surface of the finished product according to organisational requirements to protect the surface 5.7. Remove finished product to storage and shipment
6. Control hazards	6.1. Identify hazards during the process or within the work area

ELEMENT	PERFORMANCE CRITERIA
	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 section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- using and maintaining all required materials, tools and parts
- recognising situations which could cause production problems and taking appropriate action
- implementing enterprise's procedures and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the production of fibrous plaster products
- diagnosing and solving problems involved in the work
- communicating effectively with team members, management and in some cases, clients
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- specified quality standards
- characteristics of different materials
- requirements from drawings, specifications or job sheets
- distinguish between causes of faults such as:

REQUIRED SKILLS AND KNOWLEDGE

- materials faults
- dimensional inaccuracies
- inappropriate allowance for material shrinkage

Evidence 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

Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:

- OHS requirements are met
- quality improvement techniques are applied
- emergency procedures are understood and applied
- waste is minimised.

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

EVIDENCE GUIDE	
	units.
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
Products	Products may include: • ornamental castings including scotias, cornices and arches • centre pieces (both reinforced and un-reinforced) • ornamental recessed panels
Equipment and unit operations	This unit of competency includes all such items of equipment and unit operations which form part of the modelling process. These may include: • slides • templates • reinforcing materials • separation agents • lifting equipment (for large work)
Fibre	Fibre may be glass fibre or other appropriate fibre
Typical problems	Typical problems may include: • incorrect calculations or setting out • inappropriate plaster mixtures • variations in ambient temperature

RANGE STATEMENT	
	inappropriate placement of reinforcing or anchor points
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		

PMC553080B Set up and optimise finishing process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers setting up and optimising the finishing process for a flat sheet manufacturing process such as fibre board or plasterboard. It involves monitoring and interpreting process data, adjusting processes, completing quality and fault finding inspections and monitoring stock.

Application of the Unit

Application of the unit	This unit of competency applies to operators who are responsible for setting up, monitoring and tuning equipment or processes to optimise performance, including the rectification of non-routine equipment and quality problems. 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		

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 the process for production	1.1. Identify all safety and emergency procedures 1.2. Shut down all equipment in accordance with work instructions and manufacturer's specifications 1.3. Consult the production schedule to determine the product to be manufactured 1.4. Ensure that the raw materials are available as required 1.5. Ensure that the equipment change parts, ancillaries and fixtures are available as required 1.6. Complete records and logs for setup of finishing equipment
2. Set up finishing process	2.1. Perform checks and tests to product and equipment specifications 2.2. Ensure alignment of all equipment by performing checks and adjustments according to product specifications/work instructions 2.3. Ensure that process and equipment is setup as

ELEMENT	PERFORMANCE CRITERIA
	required for the production schedule 2.4.Ensure that the equipment is in a safe condition for use
3. Monitor, interpret data and adjust operation	3.1.Monitor instruments and control panels, and interpret test results for fluctuations, variations and trends 3.2.Monitor plant and process and deduce conditions of materials in process and products being made 3.3.Determine appropriate action to improve process operation 3.4.Adjust controls to ensure product parameters are maintained to job specifications 3.5.Check that process operation has improved 3.6.Continue analysing data and making adjustments until desired level of process operation is achieved and product is within specifications in accordance with work instructions
4. Sample, test and record product data	4.1.Carry out sampling procedures appropriate to the product and the test in line with enterprise requirements 4.2.Complete appropriate test to enterprise and client requirements 4.3.Measure/graph and record operating parameters, according to enterprise requirements 4.4.Record test results in hard or electronic form as required by standard procedures and work instructions
5. Rectify equipment and quality problems	5.1.Identify the range of equipment and quality faults that can occur during the operation 5.2.Determine and rectify equipment and quality fault causes in accordance with established enterprise procedures 5.3.Identify and rectify equipment failure causes in accordance with established enterprise procedures 5.4.Make sure appropriate records and log books of equipment operations are maintained to meet enterprise requirements 5.5.Identify non-routine problems and rectify within area of responsibility 5.6.Report problems outside area of responsibility to designated person
6. Shut down	6.1.Shut down equipment in accordance with work

ELEMENT	PERFORMANCE CRITERIA
equipment	instructions 6.2. Complete appropriate records and logs 6.3. Shut down equipment in an emergency situation
7. Control hazards	7.1. Identify hazards from the job to be done 7.2. Identify other hazards in the work area 7.3. Assess the risks arising from those hazards 7.4. Implement measures to control those risks in line with 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 process conditions that will lead to out of specification production
- implementing enterprise's standard procedures and work instructions and relevant regulatory requirements in a manner relevant to the operation of the process
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- composition and nature of the product
- setup/changeover and tuning of all equipment
- startup and shutdown processes
- optimisation of process for yield maximisation
- construction and limitations of the equipment
- out of specification situations
- quality problems such as poor optics, excessive breakage, non-uniform break pattern, incorrect cross bend, excessive bow, scratches or poor glass shape
- distinguish between causes of problems, such as:
 - raw material
 - mechanical
 - electrical/instrument

Evidence 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 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 trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look to see that:

- setup/changeover/tuning are completed to specifications
- plant conditions are maintained within limits
- quality is monitored to minimise wastage
- startup and shutdown occur first time
- early warning signs of equipment/processes needing attention or potential problems are recognised and dealt with in a timely manner
- process measurements are continually made or observed
- adjustments are completed in a timely manner
- the range of possible causes can be identified and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems to related plant 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 will require access to an operating plant over an extended period of time, or a suitable method of

EVIDENCE GUIDE	
assessment	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. 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 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	This competency unit includes equipment applicable to finishing flat sheet product such as: • sanding • sealing • priming

RANGE STATEMENT	
	• rebating
Tools and equipment	Tools and equipment may include: • finishing and associated equipment • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Process	The process includes: • setting up, monitoring and tuning equipment for optimum performance especially during startup, job change and equipment changes
Typical problems	Typical problems may include: • raw materials supply • equipment alignment • analysis of all plant data • product quality • equipment problems
Plant data	Plant data may include: • test results • instrument/control panel information • data from physical senses (sight, sound and hearing) • temperatures, pressures, material flow and discharge rates and effects • variations to chemical reactions/material modifications
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		

PMC554020D Design and prepare models, moulds and dies

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the design and preparation of models, moulds, and dies, and includes the preparation of cases and frames.

Application of the Unit

Application of the unit	This unit of competency applies to technicians or tradespeople who are responsible for determining the requirements for devices to be made from plans, specifications and schedules. Technicians are able to make the device from materials selected and adjust and check its dimensional accuracy. Often the devices are made from timber, but other materials, including sheet metal and fibreglass, for instance are possible. This unit of competency covers the making of moulds, models and dies for use in a variety of manufacturing operations, such as: • concrete products • clay products • ceramic products This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic work. This competency is typically performed by an experienced technician, leading hand or supervisor.

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. Design and make models	1.1. Establish model design from drawings, originals or in consultation with the customer 1.2. Select and prepare appropriate materials for model construction 1.3. Make models ensuring the final product is to specification, and shrinkage is allowed for
2. Set up and produce block moulds	2.1. Select appropriate model to meet specification 2.2. Determine required sections and parting lines 2.3. Check mould meets occupational health and safety

ELEMENT	PERFORMANCE CRITERIA
	(OHS) needs 2.4. Mix materials as required 2.5. Fill mould with mould material as required 2.6. Remove mould from model when required strength has been achieved 2.7. Finish mould to specifications and register correctly
3. Prepare cases and frames	3.1. Consult manufacturing schedule to determine type of mould to be made 3.2. Select appropriate frame or frames 3.3. Mix materials as required 3.4. Fill block mould 3.5. Remove block mould from the case and frame when required strength has been obtained 3.6. Register and date cases according to procedures 3.7. Prepare block mould for use
4. Prepare and make working moulds	4.1. Select the appropriate case/frame 4.2. Mix and pour mould material as required 4.3. Remove mould from model when required strength has been obtained 4.4. Finish and register moulds to procedures 4.5. Stack and dry moulds to procedures 4.6. Store moulds to procedures
5. Prepare dies	5.1. Consult manufacturing schedule to determine type of die to be made 5.2. Select and prepare required master die 5.3. Mix and pour die material as required 5.4. Remove die from master die when required strength has been obtained 5.5. Mark and finish dies to enterprise specifications 5.6. Cure and store dies to procedures
6. Respond to problems	6.1. Identify possible routine and non-routine problems in the 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 6.5. Report problems outside area of responsibility to designated person

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- using and maintaining all required materials, tools and parts
- recognising situations which could cause production problems and taking appropriate action
- implementing enterprise's procedures and relevant regulatory requirements within appropriate time constraints and in a manner relevant to the operation of moulds and dies
- diagnosing and solving problems involved in the work
- predicting hazards that may arise from mould or die design or preparation
- communicating effectively with team members, management and other departments
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- specified quality standards
- characteristics of different materials
- requirements from drawings, specifications or job sheets
- distinguish between causes of faults such as:
 - materials
 - dimensions
 - allowance for shrinkage
 - damage to components

Evidence 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	Competence must be demonstrated in the ability to recognise situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • OHS requirements are met • quality improvement techniques are applied • emergency procedures are understood and applied • waste is minimised.
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	This unit has no prerequisite competencies. 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

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.	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Materials	Materials may include: • additives • body materials • epoxy resins • metal strapping • plaster • plastic • release agents • rubber • slip • timber • water
Equipment	Equipment may include: • block moulds and working moulds • cases and frames • hand and power tools • jigs and fixtures • master dies • mixing equipment • models • weighing equipment
OHS	The identification and control of hazards and the application of OHS are to be in accordance with current, applicable legislation and regulations, and company procedures. 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		

PMC554090B Undertake simple refractory design

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers applying design principles and undertaking simple design tasks. The technical requirements of the design are paramount and the application of an understanding of refractories, heat transfer and refractory wear and failure mechanisms are primary. The aesthetics of the design are of little if any significance.

Application of the Unit

Application of the unit	This unit of competency applies to technicians who are responsible for designing simple or small refractory installations or repairs. They apply the principles of heat transfer, thermal expansion, abrasion and structures along with a knowledge of refractory materials and installation techniques to the design to yield a product which will meet a rigid technical specification. This unit covers a refractory design for a situation which can be achieved by the application of standard products/components in a standard manner. It does not cover innovative products/ applications nor those situations where the design must be done by a registered engineer, although it may involve working with an engineer on a design This will typically be done by an individual technician working in liaison with customers, installers and technical experts.

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 the suitability of resources	1.1. Check all information conforms with resources 1.2. Record discrepancies in information 1.3. Report any inaccuracies in information to the person in charge 1.4. Identify and select materials, components, tools and equipment
2. Undertake mechanical design	2.1. Determine strength requirements 2.2. Determine operating temperature range 2.3. Select materials/mix with appropriate mechanical

ELEMENT	PERFORMANCE CRITERIA
	strength 2.4. Identify hazards of materials and processes to be used and apply hierarchy of control to control hazards 2.5. Determine expansion which will occur for this material 2.6. Adjust material/mix to be suitable for temperatures
3. Undertake thermal design	3.1. Determine heat flow through the refractory 3.2. Determine interface temperatures for multi-component linings 3.3. Use simple software 3.4. Determine interface bonding/anchor issues
4. Specify refractory design	4.1. Specify materials to be used 4.2. Specify installation method to be used 4.3. Confirm specification meets customer needs and installer 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:

- adjusting/correcting/responding to work requirements
- identifying and resolving problems
- using simple software for calculations
- working in a team or individually, as required
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- heat flow calculations
- awareness of other relationships involved with these calculations
- refractory materials and their properties
- refractory installation techniques

REQUIRED SKILLS AND KNOWLEDGE

- structural strength of refractories
- thermal expansion of refractories
- methods of tying refractories

Evidence 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

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:

- the technical aspects of the design are identified and an appropriate solution is proposed.

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.

EVIDENCE GUIDE	
Method of assessment	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 other relevant units.
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
Refractory materials	Refractory materials are those materials that have a resistance to temperature and include: • alumina silicate materials (clay) • silliminities • bauxite • synthetic aggregates • silica • magnesite • dolomite • chrome ores
Refractory installation techniques	Refractory installation techniques include: • bricks, blocks • mouldables • castable • spray/gunned application
Occupational health and safety	All operations are subject to stringent OHS

RANGE STATEMENT	
(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		

PMC554091B Analyse refractory failures

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers analysing a refractory failure to determine failure mode. It involves understanding failure modes, differentiating different modes and understanding forensic procedures.

Application of the Unit

Application of the unit	Refractories may fail due to a number of reasons, and these may be mechanical (wear, impact) or thermal (thermal stresses, flame impingement) or due to other reasons. The analysis of failures is important so that replacement refractories can be better designed to reduce this failure and extend the time between failure/replacement. This unit covers all common types of refractory failures. The failure needs to be recognised and distinguished from other possible causes. Possible causes for the failure also need to be identified particularly if failure is unexpected/refractory life is shorter than expected This unit would typically be undertaken by a technician working either alone or in liaison with another refractory expert.

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 the suitability of resources	1.1. Check all information conforms with resources 1.2. Record discrepancies in information 1.3. Report any inaccuracies in information to the person in charge 1.4. Identify and select materials, components, tools and equipment
2. Analyse failure modes	2.1. Identify spalling modes 2.2. Identify corrosion mode 2.3. Identify abrasion modes 2.4. Identify impact/compression/tensile modes
3. Undertake forensic procedures	3.1. Plan required investigation 3.2. Specify required testwork/analyses

ELEMENT	PERFORMANCE CRITERIA
	3.3. Interpret test results 3.4. Formulate simple reports

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- observing workplace procedures
- identify and solving problems
- working in a team or individually, as required
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- basis of various failure modes
- organisation of simple testwork programs
- make appropriate judgements on results
- reporting results in report format

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

EVIDENCE GUIDE	
	action. Consistent performance should be demonstrated. In particular look to see that: investigation of a failure is undertaken and an evidence based conclusion as to the failure mode is developed.
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	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 other relevant units. Where the analysis of refractory failure is to occur on-site or in a vessel then competency in the appropriate OHS and/or permit units is also required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Investigation	Investigation involves: the collection of evidence, and may require the specifying of appropriate tests and the analysis of plant records and logs
Reports	The report should summarise: - the nature of the failure - the cause - the methods used to determine this cause - conclusions drawn and recommendations made
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	

Co-requisite units		

PMC555030C Analyse equipment performance

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the analysis of the performance, and performance verification of existing equipment. It is based on <i>PMBTECH501A Analyse equipment performance</i>. It involves calculating the theoretical performance components, gathering data, calculating performance and making recommendations based on verification results.

Application of the Unit

Application of the unit	This unit of competency applies to technicians who are responsible for setting up and operating performance verification trials and analysing the results to determine actual performance compared to theoretical performance of equipment and equipment components. It applies typically to the extrusion, automated casting or moulding sectors of the industry. This competency applies to all work environments and sectors within the industry, but does require both a theoretical/mathematical and a practical analysis of the process at a level equivalent to an analysis of screw performance in an extruder. The competency does not require 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. This competency is typically performed by a senior technician who will take the lead in the data gathering phase and then analyse 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 and plant components to be analysed 1.2. Locate and interpret design specification 1.3. Identify process materials being processed/to be processed during verification trial 1.4. Determine process material properties under process conditions 1.5. Calculate theoretical performance of components with that material under those conditions

ELEMENT	PERFORMANCE CRITERIA
2. Conduct trial	2.1.Design verification trial to be compatible with theoretical analysis 2.2.Check trial design to ensure occupational health and safety (OHS) issues are identified and addressed 2.3.Determine measurements needed from trial to yield required data 2.4.Select equipment suitable to give required measurements 2.5.Consult with relevant stakeholders 2.6.Arrange for verification trial with relevant process personnel 2.7.Set up required measurement equipment 2.8.Supervise trial and ensure trial conditions are appropriate 2.9.Collect trial data for analysis
3. Verify performance of components	3.1.Calculate actual performance from trial data 3.2.Compare theoretical with actual performance 3.3.Determine significance of variation between theoretical and actual performance 3.4.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.Check that recommended action addresses any OHS issues 4.3.Consult with relevant stakeholders 4.4.Initiate the corrective action in accordance with company procedures 4.5.Determine measures to increase equipment productivity 4.6.Recheck performance after corrective action is implemented

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

REQUIRED SKILLS AND KNOWLEDGE

Required skills

Required skills include the ability to:

- predicting the interactions of the materials, equipment and process and their impacts on performance
- implementing the enterprise's procedures and policies within appropriate time constraints and in a manner relevant to the job
- high levels of numeracy and literacy to interpret technical specifications and reports
- advanced numeracy allowing the calculation and interpretation of statistics, product formulae and process conditions
- identifying hazards associated with the trial and implementing controls by applying the hierarchy of control

Required knowledge

Required knowledge includes:

- enterprise requirements
- calculation of 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'

Evidence 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

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

EVIDENCE GUIDE	
	action. Consistent performance should be demonstrated. In particular look to see that: • a thorough understanding of process materials, their additives and the rheological, heat and other effects of processing to the design of equipment and components are applied to predict practical performance results • material and process interactions should also be understood and able to be applied to interpreting data and making judgements about the state of the equipment/component.
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	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 other relevant units.
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

RANGE STATEMENT

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 components

This competency unit includes the analysis of equipment components such as:

- screws and casters or items of equipment or processes

Typical problems

Typical problems include:

- worn components
- validation of new components to design specification
- component performance analysis in order to upgrade process performance

Unit Sector(s)**Unit sector**

Operational/technical

Competency field**Competency field****Co-requisite units**

Co-requisite units		

PMC555031B Choose materials for an application

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the application of the knowledge of materials characteristics to their properties so enabling the choice of an appropriate material mix for an application. It is based on <i>PMBTECH505A Choose polymer materials for an application</i> .

Application of the Unit

Application of the unit	This unit of competency applies to technicians who are able to bring together an understanding of the basics of chemistry and physics and apply this understanding to determine the properties of process materials and products. This competency applies to all work environments and sectors within the industry. This competency is typically performed by technicians developing new products or applying this knowledge to advanced process/product problem solving.

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 possible product properties	1.1. Estimate product properties from different materials and processing conditions 1.2. Predict the impact of different grades of materials/additives on product properties 1.3. Predict the impact of different processing conditions on product properties
2. Choose materials/ material mix for an application	2.1. Select appropriate base materials for an application based on the material properties 2.2. Determine reinforcements/additives required to meet product specification 2.3. Predict failure mechanism for selected mix and modify selection if appropriate 2.4. Identify any health, safety or environmental issues with materials and modify selection if appropriate 2.5. Develop formulation and select appropriate production method

ELEMENT	PERFORMANCE CRITERIA
3. Organise testing of product and interpret test results	3.1. Select appropriate tests for product based on test purpose and limitations, and material being tested 3.2. Test colour using colour coordinates as required 3.3. Interpret test results and modify formulation/production method as required to meet product specification

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 enterprise standard procedures and policies, relevant regulatory requirements and national/international standards within appropriate time constraints and in a manner relevant to the job
- adjusting/correcting/responding to work requirements
- identifying and solving problems
- working in a team or individually, as required
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- basic chemistry and physics as relevant to the products and process
- process and material characteristics sufficient to enable the selection of materials with appropriate base properties including:
 - property changes caused by different processing methods and conditions
 - typical processing conditions for typical products
 - property changes caused by using additives
 - mechanism of reinforcement where appropriate
 - test methods
 - properties and applications of materials

Evidence 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	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: knowledge of material properties to the selection of appropriate materials to an application is applied.
Context of and specific resources for assessment	Competence in this unit may be assessed: - by observation of an actual design project where the assessee takes a lead technical role in the material selection - by use of a suitable project where arrangements are made to include the testing aspects. 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

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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

Standard procedures

Standard procedures refer to:

- all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards

Properties

Properties include:

- particle size, size distribution, particle shape and porosity
- flow properties, melt viscosity
- rigidity, tensile yield strength, modulus and impact strength
- brittle and ductile failure
- dimensional and thermal stability

Reinforcements

Reinforcements include:

- silicas and clays
- glass
- fibres
- steel

Test methods

Test methods include:

- environmental tests - ultra-violet (UV), environmental stress, cracking, weatherometer and chemical resistance
- mechanical tests - tensile, creep, coefficient of

RANGE STATEMENT	
	friction, wear resistance/abrasion and density - chemical/analytical tests - colour tests - colour coordinates (LAB), colour difference ((E)

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC556031C Design structural/mechanical components

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the mechanical/structural design of components which are to be made from manufactured mineral products. It applies the traditional engineering structures to brittle materials. It is based on <i>PMBTECH603A Design structural/mechanical polymer components</i> .

Application of the Unit

Application of the unit	This unit of competency applies to senior technicians/technologists who are designing, or part of a team designing, structures or structural or mechanical components. This unit of competency relates to the design of a new product or a component of a new product which has a significant structural or mechanical requirement. It assumes an understanding of the operation of all relevant equipment and processes but does not necessarily require them to be used personally. This unit does NOT provide a qualification as a certified structural engineer such as might be required by government regulation for some structures. However, persons with this qualification should be able to work closely with such people, if required, providing specialised material and process knowledge. This competency applies to all work environments and sectors within the industry. The competency assumes a working knowledge of all main processes and materials so that an informed choice can be made between them. The key factors in the design of the component are adequate strength and toughness and making allowances for, and taking maximum advantage of, the inherent properties of manufactured mineral product materials.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
	<i>PMC555031B</i>	<i>Choose materials for an application</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 mechanical/structural design requirements	1.1. Determine stress/strain requirements of end use 1.2. Determine flexural/rigidity requirements of end use 1.3. Determine required physical properties (such as size, shape and density) of end use 1.4. Determine environmental requirements (physical, chemical, radiation) of end product

ELEMENT	PERFORMANCE CRITERIA
	1.5. Identify how component fits with entire end product 1.6. Develop mechanical design brief and verify with appropriate people
2. Select materials and additives, including reinforcing, appropriate for the design brief	2.1. Select material/combination of materials with appropriate physical properties 2.2. Select material/combination of materials with appropriate chemical properties 2.3. Select material/combination of materials with appropriate radiation resistance/transmission properties 2.4. Arrange for compounding and testing of possible materials as appropriate 2.5. Determine relevant properties of selected material/shortlisted materials
3. Undertake mechanical design of component	3.1. Calculate size and shape/profile of component to meet design brief 3.2. Liaise with product developer to also deliver required aesthetic aspects 3.3. Liaise with product developer/production to ensure efficiency in manufacture 3.4. Suggest modifications to materials/compound as required
4. Design jointing/joining/ other product interfaces	4.1. Liaise with designers of other components 4.2. Agree on interface requirements/joints/joining as appropriate 4.3. Design suitable interfaces 4.4. Check interface design to ensure it meets the end use requirements without sacrificing integrity.
5. Finalise design	5.1. Check internal consistency of design 5.2. Check overall design meets end use requirements 5.3. Ensure issues identified in the hazard analysis for both end use safety requirements and manufacturing requirements are addressed in the final design 5.4. Write component specification 5.5. Liaise with product developer/production to write production specification/procedures 5.6. Supervise manufacture and testing of prototypes/manufacturing trials as appropriate 5.7. Finalise specifications and manufacturing

ELEMENT	PERFORMANCE CRITERIA
	processes, and complete all reports 5.8. Ensure project records are complete and all required reports have been completed and submitted 5.9. Archive records according to company 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:

- designing a component which is mechanically/structurally fit for its end purpose and which can be efficiently manufactured
- implementing enterprise policies and procedures and relevant regulatory requirements, including the OHS legislative obligations of designers within appropriate time constraints, and in a manner relevant to the job
- high levels of numeracy and literacy to write and interpret technical specifications and reports
- advanced numeracy allowing the calculation and interpretation of statistics, design formulae and process conditions

Required knowledge

Required knowledge includes:

- stress/strain data of materials to the design situation
- material flow properties
- impact and notch strength
- tensile, compressive, shear and torsional strength
- adequate safety factors
- overall design features which take advantage of the materials being used
- make compounding recommendations to modify properties such as:
 - stress/strain data of materials
 - flow, rheometric properties
 - material strength
 - environmental resistance (e.g. temperature, chemicals, ultra-violet (UV) and other radiation)
- make changes to physical size and shape to change:

REQUIRED SKILLS AND KNOWLEDGE

- stiffness/rigidity and deflection
- strength

Evidence 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

Consistent performance should be demonstrated. In particular look to see that:

- a thorough understanding of materials, their additives and the rheological, heat and other effects of processing to the design of a new mechanical or structural component are applied
- both compound design and mechanical design are able to be modified to optimise the results
- the designed product is fit for its purpose and also capable of safe and efficient manufacture for an appropriate price/cost.

Context of and specific resources for assessment

This unit of competency requires a detailed understanding of mechanics such as might be gained from some engineering studies. Where this knowledge is to be gained as part of this unit of competency, it will require a significantly greater effort and time than would otherwise be required.

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

EVIDENCE GUIDE	
	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	This unit of competency assumes the knowledge component included in the following unit of competency: • <i>PMC555031B Choose materials for an application</i> Competence in this unit may be assessed: • by observation of an actual design project where the assessee takes a lead technical role • by use of a suitable design project where arrangements are made to also assess the implementation aspects. Evidence must be available that the specified knowledge has been acquired and is able to be applied or the units may be co-assessed:
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
Standard procedures	Standard procedures refer to: • all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards

RANGE STATEMENT**Situations**

The situations covered by this unit include, but are not limited to:

- critical load bearing structural components requiring significant design such as columns and beams
- critical mechanical components transmitting power/forces such as shafts, gears and bearings
- component joints/joins
- components with a critical rigidity/flexural specification
- individual components
- integrated structural components
- large and small components

Unit Sector(s)**Unit sector**

Operational/technical

Competency field**Competency field****Co-requisite units**

Co-requisite units		

PMC557001A Manage trials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the managing of trials of new/modified materials, process, methods, equipment and/or plant. The trial is aimed at determining suitability or checking performance. It will result in a report which may include recommendations for a new trial and/or for improvement or may result in a recommendation to accept the subject of the trial.

Application of the Unit

Application of the unit	This unit of competency requires the application of technical knowledge about the subject of the trial along with a critical evaluation of trial outcomes. It may include aspects of project management and people and process management in order for the trial to be completed. This unit could apply to any sector in the industry and it may be appropriate to consider relevant technical units concurrently. Trialling may refer 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 • direct trialling of the proposed new material, method, process, plant or equipment • large scale pilot plant, demonstration plant or full scale plant trials. This unit of competency applies to individuals who will be managing a trial. They will typically be the sole manager of the trial or a co-manager with a defined scope of responsibility. The trials will involve liaising with various

	technical experts and stakeholders and coordinating the work of people at all levels in order to complete the trial. This unit may apply to individuals working for the organisation conducting the trial, a consulting organisation or a customer or supplier organisation conducting the trials on behalf of their customer or supplier.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine purpose of trial	1.1. Analyse documentation available on trial 1.2. Consult with trial proponent and other stakeholders 1.3. Define purposes of trial

ELEMENT	PERFORMANCE CRITERIA
	1.4. Confirm trial purpose with all stakeholders 1.5. Identify health, safety and environment (HSE) and other risks from the trial 1.6. Negotiate conflicts in trial purpose 1.7. Promulgate agreed trial purpose
2. Determine trial metrics	2.1. Determine information required from trial 2.2. Identify relevant data which is available or which could be made available 2.3. Identify gaps in data and negotiate suitable proxies for data 2.4. Arrange for data to be collected 2.5. Ensure there is appropriate capability for required data manipulation 2.6. Ensure the availability of appropriate procedures/protocols for collection and manipulation of data
3. Coordinate trial	3.1. Develop procedures required for trial 3.2. Check procedures to ensure appropriate risk management is included 3.3. Draft trial plans 3.4. Confirm trial plans with all relevant personnel 3.5. Negotiate conflicts as required 3.6. Promulgate agreed trial plans 3.7. Arrange for the required resources to be available when required by plan 3.8. Coordinate the implementation of the trial plan 3.9. Recognise indications of developing problems and take appropriate action 3.10. Monitor the progress to plan and take appropriate action to achieve required outcomes 3.11. Conclude trial when appropriate
4. Interpret trial results	4.1. Ensure all data is collated and manipulated as required 4.2. Interpret data in terms of trial purpose 4.3. Analyse data for unexpected outcomes 4.4. Determine trial outcomes 4.5. Draft trial report, including recommendations 4.6. Discuss report with relevant stakeholders as appropriate

ELEMENT	PERFORMANCE CRITERIA
	4.7.Publish final report and recommendations 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:

- solving problems
- communicating at all levels
- using organisation knowledge system
- analysing
- interpreting and manipulating data
- negotiating
- technical reporting
- interpreting technical documentation

Required knowledge

Required knowledge includes:

- problem/trial purpose definition techniques
- risk management protocols and procedures
- maths and statistics to the level required to analyse and manipulate trial data
- skills gap/training needs analysis as related to possible trials
- project/trial planning and management
- production/trial scheduling and resource requirement estimation
- communication protocols and methods of achieving them
- indicators of developing problems and appropriate action required
- data interpretation methods
- protocols and regulatory limits on discussions of results and recommendations
- recognition and application of significant unexpected results
- reporting 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

Assessment of this unit should include demonstrated competence in a workplace based project or a simulated workplace project. Evidence from one large trial may be sufficient, while generally several small trials will be required to generate sufficient evidence.

Access should be available to all normally accessed tables, data etc which would be available to and used by a competent refractory specialist performing this assignment.

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

Competence must be demonstrated in the ability to manage an appropriate trials and write the required reports.

Context of and specific resources for assessment

Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.

Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Method of assessment

- Assessment must satisfy the endorsed assessment guidelines of the Manufactured Mineral Products Training Package.
- Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge.
- Assessment methods which include direct observation of tasks should also include questioning on underpinning knowledge to ensure its correct interpretation and application.

EVIDENCE GUIDE	
	• Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Documentation	Documentation available may include: • plant/process/equipment drawings/schematics • technical specifications • sales/promotional information • technical papers • notes/minutes from meetings/discussions • emails
Purpose of the trial	Purpose of the trial may include: • evaluation of new • examination of existing • specific improvements aimed at: • better sustainability outcomes • better technical outcomes • greater reliability • greater efficiency • cheaper costs

RANGE STATEMENT	
Promulgate	Promulgation of information includes: • providing the right information to the right person in the right format in a timely fashion
HSE and other risks	HSE and other risks include: • health and safety risks • sustainability risks • regulatory risks • business risks
Capability	Capability for data manipulation includes: • required hardware • required software • required competence of the workforce
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
Resources	Resources required for trial include: • materials • plant and equipment • required utilities • waste disposal/emission control and similar • time allocation • personnel • competencies of personnel • space
Appropriate action	Appropriate action may include: • immediately ceasing the trial

RANGE STATEMENT	
	• modifying the trial and proceeding • continuing the trial with modified monitoring/data collection • no change
Trial results	Trial results may include a recommendation: • for adopting the trial as standard • for another trial with some changes • to stay with the <i>status quo</i> • a recommendation which is outside the initial scope but which is consistent with the results of the trial

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC557090A Select refractory materials for an application

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers confirming the application and conditions of use of the proposed refractory and then selecting the most appropriate materials for that use. It is intended for refractory experts who will most likely also have some management responsibility.

Application of the Unit

Application of the unit	This unit of competency requires the application of knowledge about refractory properties and uses to the selection of an appropriate refractory material, or combination of materials for a specified end use. This unit does not involve the design of the refractory lining which is covered by <i>PMC557091A Design a refractory lining</i>. The units are obviously related and it may be appropriate to consider both concurrently. This unit applies to individuals who will be designing a refractory installation or component and may also be monitoring the installation of the refractory. They may be working in liaison with other refractory specialists or they may be the sole refractory specialist for this job/in their organisation. They will typically be liaising with a range of other technical experts as well as management and maybe accounts. This unit may apply to individuals working for an organisation which supplies and installs refractories, is a refractory consulting organisation or a client organisation which buys and uses the refractory.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Confirm required end use	1.1.Liaise with relevant stakeholders 1.2.Confirm the end use conditions for the refractory 1.3.Identify discrepancies or conflicts in requirements 1.4.Negotiate a consistent set of requirements for the refractory material
2. Shortlist appropriate refractory materials	2.1.Compare the properties of refractory materials with the set of requirements 2.2.Identify situations where the use of more than one material may be desirable 2.3.Rank possible materials solutions 2.4.Identify health, safety and environment (HSE) risks of top ranked possible material solutions

ELEMENT	PERFORMANCE CRITERIA
	2.5. Estimate the cost of top ranked possible material solutions
3. Recommend a refractory material/ combination of refractory materials	3.1. Liaise with relevant stakeholders 3.2. Determine installation, repair or removal issues of relevance to the material selection 3.3. Review short list ranking 3.4. Recommend optimum material/combination of materials for the end use
4. Develop technical specification for recommended materials	4.1. Determine suitable format for specification 4.2. Prepare specification 4.3. Review specification with refractory designers and installer 4.4. Modify specification if required 4.5. Publish specification in required format to required people/organisations

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- solving problems
- communicating at all levels
- using organisation knowledge system
- analysing
- interpreting data
- negotiating
- technical reporting

Required knowledge

Required knowledge includes:

- properties of all common refractory materials
- typical limitations and applications of all common refractory materials
- installation methods and their impacts on material selection

REQUIRED SKILLS AND KNOWLEDGE

- reasons for using more than one material for an application
- properties of combinations of materials and impacts on the specification of the materials
- heat transfer calculations (resistances in series and parallel)
- common refractory repairs and their impacts on material selection
- methods of reuse, recycling and disposal of refractories at the end of their life and the differences for different types of refractory material
- critical refractory specifications

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

Assessment of this unit should include demonstrated competence in a workplace based project or a simulated workplace project.

Access should be available to all normally accessed tables, data etc which would be available to and used by a competent refractory specialist performing this assignment.

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

Competence must be demonstrated in the ability to select an appropriate material and write the required specification.

Context of and specific resources for assessment

Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.

Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified

EVIDENCE GUIDE	
	for people with disabilities.
Method of assessment	• Assessment must satisfy the endorsed assessment guidelines of the Manufactured Mineral Products Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods which include direct observation of tasks should also include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Stakeholders	Stakeholders may include: • customer representatives • technical experts • regulators • refractory designer

RANGE STATEMENT	
	refractory installer
End use conditions	End use conditions may include: - surface temperature of refractory - required temperature gradient through refractory/outside surface temperature - chemical condition (e.g. pH) - mechanical condition (e.g. impingement) - temperature or other cycling)
Ranking of materials solution	Ranking should be based on: how well they meet the technical requirements of the end use
HSE risks	HSE risks should include focus on the comparative health, safety and environmental risks of the materials under consideration. Risks would include risks during: - installation - use - repair - removal and disposal at end of life
Cost of materials	Cost of materials should be total costs and should include: - raw material costs - installation costs - life cycle costs
Combination of materials	The term 'combination of materials' is used in this unit to mean any or all of: - mixing of more than one refractory material - use of refractory materials in series - use of refractory materials in parallel
Optimum materials	The optimum materials would be material or combination of materials which best delivers the technical requirement at the lowest cost and the least HSE risk

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC557091A Design a refractory lining

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers confirming the application and conditions of use of the proposed refractory and then designing the most appropriate refractory system for that use. It is intended for refractory experts who will most likely also have some management responsibility.

Application of the Unit

Application of the unit	This unit of competency requires the application of knowledge about types of refractories, refractory properties and uses to the design of an appropriate refractory system for a specified end use. This unit does not cover the selection of the refractory material which is covered by <i>PMC557090A Select refractory materials for an application</i>. The units are obviously related and it may be appropriate to consider both concurrently. This unit applies to individuals who will be designing a refractory installation and may also be monitoring the installation of the refractory. They may be working in liaison with other refractory specialists or they may be the sole refractory specialist for this job/in their organisation. They will typically be liaising with a range of other technical experts as well as management and maybe accounts. This unit may apply to individuals working for an organisation which supplies and installs refractories, is a refractory consulting organisation or a client organisation which buys and uses the refractory.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Confirm required end use	1.1.Liaise with relevant stakeholders 1.2.Confirm the end use conditions for the refractory 1.3.Identify discrepancies or conflicts in requirements 1.4.Negotiate a consistent set of requirements for the refractory installation
2. Undertake preliminary design	2.1.Compare the benefits of different types of refractory installations 2.2.Undertake required structural design calculations 2.3.Undertake the required heat transfer calculations 2.4.Undertake relevant thermal expansion calculations 2.5.Determine implications for refractory material

ELEMENT	PERFORMANCE CRITERIA
	selection 2.6.Liaise with refractory material selector
3. Compare possible design solutions	3.1.Compare the refractory systems with the set of requirements 3.2.Rank possible refractory system solutions 3.3.Identify health, safety and environment (HSE) risks of top ranked possible refractory system solutions 3.4.Estimate the cost of top ranked possible refractory system solutions
4. Design refractory system	4.1.Liaise with relevant stakeholders 4.2.Determine installation, repair or removal issues of relevance to the refractory systems 4.3.Review short list ranking 4.4.Recommend optimum refractory system for the end use
5. Develop design and technical specification for recommended refractory system	5.1.Determine suitable format for design and specification 5.2.Prepare design and specification 5.3.Review specification with refractory material selector and installer 5.4.Modify design and specification if required 5.5.Publish design and specification in required format to required people/organisations

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- solving problems
- communicating at all levels
- using organisation knowledge system
- analysing
- interpreting data
- negotiating

REQUIRED SKILLS AND KNOWLEDGE

- technical reporting
- technical drawing - possibly computer aided drafting (CAD)

Required knowledge

Required knowledge includes:

- properties of all common refractory systems
- typical limitations and applications of all common refractory systems
- installation methods and their advantages, disadvantages, typical uses and limitations
- heat transfer calculations (resistances in series and parallel)
- structural calculations (beam, column, arch, strength of refractory materials, and physical properties of refractory materials)
- thermal expansion (calculation of and allowance for)
- refractory anchors, types, uses and selection
- refractory installation methods and their impact on design
- common refractory repairs and their impacts on design
- methods of reuse, recycling and disposal of refractories at the end of their life and the differences for different types of refractory systems
- critical refractory specifications

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment	Assessment of this unit should include demonstrated competence in a workplace based project or a simulated workplace project. Access should be available to all normally accessed tables, data etc which would be available to and used by a competent refractory specialist performing this assignment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to design an appropriate refractory system and write the required specification.
Context of and specific resources for	Assessment may occur on the job or in an appropriately

EVIDENCE GUIDE	
assessment	simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	• Assessment must satisfy the endorsed assessment guidelines of the Manufactured Mineral Products Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods which include direct observation of tasks should also include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

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. Essential operating conditions that may be 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.	
Stakeholders	Stakeholders may include: • customer representatives • technical experts • regulators • refractory designer • refractory installer
End use conditions	End use conditions may include: • surface temperature of refractory • required temperature gradient through refractory/outside surface temperature • chemical condition (e.g. pH) • mechanical condition (e.g. impingement) • temperature or other cycling
Types of refractory installations	Typical types of refractory installation include: • block/precast • monolithic/castable • gunite/shotcrete • refractory coating • multilayer refractory linings (e.g. hard face over insulating refractory)
Ranking of refractory system solution	Ranking should be based on: • how well they meet the technical requirements of the end use
HSE risks	HSE risks should include focus on the comparative health, safety and environmental risks of the refractory systems under consideration. Risks would include risks during: • installation • use • repair • removal and disposal at end of life
Cost of refractory systems	Cost of refractory systems should be total costs and should include:

RANGE STATEMENT	
	• material costs • installation costs • repair costs • life cycle costs
Optimum refractory system	The optimum refractory system would be: • that system which best delivers the technical requirement at the lowest cost and the least HSE risk

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC557092A Specify and interpret refractory tests

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the analysis of specifications and possibly contracts to determine what technical information is required, specifying the appropriate testing regime to deliver the required data and then interpreting that data to obtain the required information.

Application of the Unit

Application of the unit	This unit of competency requires the application of knowledge about refractory properties and uses and refractory testing to the acquisition of information about the relevant properties of a refractory. This unit does NOT involve the doing of the tests which is covered by <i>MSAL974005A Perform physical tests</i> or other relevant units in the Laboratory Operations qualifications. This unit applies to individuals who will be designing a refractory installation or component and may also be monitoring the installation of the refractory. They may be working in liaison with other refractory specialists or they may be the sole refractory specialist for this job/in their organisation. They will typically be liaising with a range of other technical experts as well as management and maybe accounts. The specification of the testing regime may form part of the refractory specification. This unit may apply to individuals working for an organisation which supplies and installs refractories, is a refractory consulting organisation or a client organisation which buys and uses the refractory.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine information required from tests	1.1. Analyse relevant documents for any test information requirements 1.2. Liaise with relevant stakeholders to determine test information requirements 1.3. Confirm the end use conditions for the refractory 1.4. Identify discrepancies or conflicts in requirements 1.5. Negotiate a consistent set of test information requirements
2. Specify required tests	2.1. Determine data required to yield the required information 2.2. Determine range of tests and test methods which will yield that data the set of requirements

ELEMENT	PERFORMANCE CRITERIA
	2.3. Make a preliminary selection of tests which will provide required data 2.4. Identify health, safety and environment (HSE) risks of possible tests 2.5. Estimate the cost of possible tests 2.6. Confirm test data will yield information required by stakeholders 2.7. Specify preferred range of tests and test methods to provide required data
3. Specify sampling regime	3.1. Identify sample requirements of specified tests 3.2. Determine sampling frequency required to meet information requirements 3.3. Draft sampling regime 3.4. Liaise with relevant stakeholders in relation to sampling regime 3.5. Negotiate changes to sampling regime and/or information requirements as required. 3.6. Finalise testing and sampling regime
4. Interpret test data	4.1. Inspect test data for anomalies or discrepancies and take required action 4.2. Determine required information from test data 4.3. Analyse information as required 4.4. File and report information as required 4.5. Take appropriate action based on information

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- solving problems
- communicating at all levels
- using organisation knowledge system
- analysing
- interpreting data

REQUIRED SKILLS AND KNOWLEDGE

- negotiating
- technical reporting

Required knowledge

Required knowledge includes:

- data produced from all common refractory tests
- standard test methods applicable to all common refractory tests
- benefits and limitations of test methods and tests
- applicability of test data to refractory service
- maths and statistics relevant to the tests and test methods
- methods of determining information from test 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, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Assessment of this unit should include demonstrated competence in a workplace based project or a simulated workplace project.

Access should be available to all normally accessed tables, data etc which would be available to and used by a competent refractory specialist performing this assignment.

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

Competence must be demonstrated in the ability to select an appropriate material and write the required specification.

Context of and specific resources for assessment

Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.

Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.

EVIDENCE GUIDE	
	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	• Assessment must satisfy the endorsed assessment guidelines of the Manufactured Mineral Products Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods which include direct observation of tasks should also include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Relevant documents	Relevant documents may include: • specifications • contracts

RANGE STATEMENT	
	• designs • design briefs • information about refractory failures • other communications from stakeholders
Stakeholders	Stakeholders may include: • customer representatives • technical experts • regulators • refractory designer • refractory installer
End use conditions	End use conditions may include: • surface temperature of refractory • required temperature gradient through refractory/outside surface temperature • chemical condition (e.g. pH) • mechanical condition (e.g. impingement) • temperature or other cycling
Range of tests	Tests to include: • compression • modulus of rupture • thermal conductivity • density • porosity/permeability • abrasion • thermal expansion • refractoriness
Test methods	Test methods include: • Standards Australia (SAA) • International Organisation for Standardisation (ISO) • ASTM International • Joint Support Office (JSO)/Deutsches Institut für Normung (DIN)
Preliminary selection of tests	Preliminary selection should be based on: • how well they meet the technical requirements
HSE risks	HSE risks should include focus on the comparative health, safety and environmental risks of the tests

RANGE STATEMENT	
	under consideration. Risks would include risks during: • sampling • testing equipment and conditions • sample retention of required test • disposal of discarded sample and test piece
Cost of test	Cost of materials should be total costs and should include: • cost of sample • cost of sampling • capital and recurrent cost of test • cost of data interpretation
Preferred range of tests and test methods	The preferred range of tests and test methods would be: • those tests which best deliver the technical requirement at the lowest cost and the least HSE risk
Determining information and analysing information	Determining information and analysing information may require: • the undertaking of calculations, drawing of graphs and the application of statistics

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC557093A Design a refractory/ceramic component

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers confirming the application and conditions of use of the proposed component and then designing the most appropriate component for that use. It is intended for refractory experts who will most likely also have some management responsibility.

Application of the Unit

Application of the unit	This unit of competency requires the application of knowledge about types of refractories, refractory properties and uses to the design of an appropriate refractory/ceramic component for a specified end use. This may be manufactured in a jobbing shop environment, or it may be a routine product manufactured by batch or continuous means. This unit does NOT cover the selection of the refractory material which is covered by <i>PMC557090A Select refractory materials for an application</i>. The units are obviously related and it may be appropriate to consider both concurrently. This unit applies to individuals who will be designing a refractory component. They may be working in liaison with other refractory specialists or they may be the sole refractory specialist for this job/in their organisation. They will typically be liaising with a range of other technical experts as well as management and maybe accounts. The components could be a refractory sleeve for a valve in an engine, a refractory tip for a flame lance or other application requiring a refractory component of a product. This unit may apply to individuals working for an organisation which supplies refractory components, is a refractory consulting organisation or a client organisation which buys and uses the refractory component.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Confirm required end use	1.1.Liaise with relevant stakeholders 1.2.Confirm the end use conditions for the refractory 1.3.Define interface requirements with the product 1.4.Identify discrepancies or conflicts in requirements 1.5.Negotiate a consistent set of requirements for the refractory component
2. Undertake preliminary design	2.1.Undertake required mechanical design calculations 2.2.Undertake the required heat transfer calculations 2.3.Undertake relevant thermal expansion calculations 2.4.Determine implications for refractory material selection

ELEMENT	PERFORMANCE CRITERIA
	2.5.Liaise with refractory material selector 2.6.Prepare preliminary designs of component
3. Compare possible design solutions	3.1.Compare the preliminary designs with the set of requirements 3.2.Rank possible design solutions 3.3.Identify health, safety and environment (HSE) risks of top ranked possible refractory designs 3.4.Estimate the cost of top ranked possible refractory designs
4. Design refractory component	4.1.Liaise with relevant stakeholders 4.2.Determine customer issues of relevance to the refractory designs 4.3.Determine manufacturing issues of relevance to the refractory designs 4.4.Review short list ranking 4.5.Recommend optimum refractory component design for the end use
5. Develop design and technical specification for recommended refractory component	5.1.Determine suitable format for design and specification 5.2.Prepare design and specification 5.3.Review specification with refractory material selector, production and customer 5.4.Modify design and specification if required 5.5.Publish design and specification in required format to required people/organisations

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- solving problems
- communicating at all levels
- using organisation knowledge system
- analysing

REQUIRED SKILLS AND KNOWLEDGE

- interpreting data
- negotiating
- technical reporting
- technical drawing - possibly computer aided drafting (CAD)

Required knowledge

Required knowledge includes:

- properties of all common refractory materials
- typical limitations and applications of all common refractory materials when used as components
- manufacturing methods for refractory components and their advantages, disadvantages, typical uses and limitations
- heat transfer calculations (resistances in series and parallel)
- mechanical calculations (stress/strain, modulus, stiffness, shear, strength of refractory materials and physical properties of refractory materials)
- thermal expansion (calculation of and allowance for)
- methods of fixing refractory components to products
- basic metal product manufacturing methods and possible uses for refractory components and their impact on component design
- methods of reuse, recycling and disposal of refractory components at the end of their life and the differences for different types of refractory components
- critical refractory component specifications

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

Assessment of this unit should include demonstrated competence in a workplace based project or a simulated workplace project.

Access should be available to all normally accessed tables, data etc which would be available to and used by a competent refractory specialist performing this assignment.

Critical aspects for assessment and evidence required to demonstrate

Competence must be demonstrated in the ability to design an appropriate refractory system and write the

EVIDENCE GUIDE	
competency in this unit	required specification.
Context of and specific resources for assessment	Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	• Assessment must satisfy the endorsed assessment guidelines of the Manufactured Mineral Products Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods which include direct observation of tasks should also include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Stakeholders

Stakeholders may include:

- customer representatives
- technical experts
- regulators
- refractory designer
- refractory installer

End use conditions

End use conditions may include:

- surface temperature of refractory
- required temperature gradient through refractory/outside surface temperature
- chemical condition (e.g. pH)
- mechanical condition (e.g. impingement)
- temperature or other cycling

Types of refractory components

Typical types of refractory components include:

- shafts
- bearing plates/rings
- nozzles and tips
- valves and valve seats
- crucibles and crucible linings
- shelving

Ranking of possible designs

Ranking should be based on:

- how well they meet the technical requirements of the end use

HSE risks

HSE risks should include focus on the comparative health, safety and environmental risks of the refractory systems under consideration.

Risks would include risks during:

- manufacture
- component installation
- use
- repair

RANGE STATEMENT	
	removal and disposal at end of life
Cost of refractory component	Cost of refractory components should be total costs and should include: - material costs - manufacturing cost - installation costs - repair costs - life cycle costs
Optimum refractory component design	The optimum refractory component design would be: that system which best delivers the technical requirement at the lowest cost and the least HSE risk

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC557094A Investigate refractory failures

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers investigating refractory failures and refractory degradation and deterioration and then recommending appropriate action. It is intended for refractory experts who will most likely also have some management responsibility.

Application of the Unit

Application of the unit	This unit of competency requires the application of knowledge about refractory deterioration, degradation and failure modes together with methods of monitoring or recognising these to determine cause and make recommendations where appropriate to improve refractory service life. This unit is related to <i>PMC554091B Analyse refractory failures</i>, which covers the technician level of refractory failure investigation. This unit applies to individuals who may be designing a refractory installation or component and may also monitor the installation of refractory, or they may be failure investigation specialists. They may be working in liaison with other refractory specialists or they may be the sole refractory specialist for this job/in their organisation. They will typically be liaising with a range of other technical experts as well as management and maybe accounts. This unit may apply to individuals working for an organisation which supplies and installs refractories, is a refractory consulting organisation or a client organisation which buys and uses the refractory.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Confirm purpose of investigation	1.1.Liaise with relevant stakeholders 1.2.Confirm the purpose of the investigation 1.3.Draft or clarify the investigation brief 1.4.Identify discrepancies or conflicts in requirements 1.5.Negotiate a consistent set of requirements for the investigation
2. Collect appropriate data	2.1.Determine information and data requirements for investigation 2.2.Identify health, safety and environment (HSE) risks from data collection 2.3.Obtain necessary authorisations to collect required data

ELEMENT	PERFORMANCE CRITERIA
	2.4.Ensure sampling/data collection meets required standard 2.5.Evaluate data for completeness and identify discrepancies and aberrations 2.6.Collate valid data as appropriate
3. Analyse data	3.1.Identify deterioration/failure modes 3.2.Determine causes of deterioration/failure 3.3.Identify refractory issues leading to excessive deterioration or failure 3.4.Identify process issues leading to excessive deterioration or failure 3.5.Identify other issues leading to excessive deterioration or failure
4. Make recommendations	4.1.Draft possible recommendations to improve refractory life 4.2.Discuss causes of failure and recommendations with relevant stakeholders if appropriate 4.3.Ensure information obtained meets the agreed purpose of the investigation and take appropriate action 4.4.Determine required format for reporting of investigation, causes and recommendations 4.5.Report as required to required people/organisations

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- solving problems
- communicating at all levels
- using organisation knowledge system
- investigating
- analysing
- interpreting data

REQUIRED SKILLS AND KNOWLEDGE
• negotiating • technical reporting
Required knowledge
Required knowledge includes: • properties of all common refractory materials • typical limitations and applications of all common refractory materials • installation methods and their impacts on refractory failure • common refractory repairs and their impacts on refractory failure • causes of refractory deterioration, degradation and failure • identification and causes of common failure modes including: • spalling • corrosion • abrasion • impact/compression/tension • thermal shock

Evidence 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 of this unit should include demonstrated competence in a workplace based project or a simulated workplace project. Access should be available to all normally accessed tables, data etc which would be available to and used by a competent refractory specialist performing this assignment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to select an appropriate material and write the required specification.
Context of and specific resources for assessment	Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas,

EVIDENCE GUIDE	
	materials and equipment, and to information on workplace practices and OHS practices. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	• Assessment must satisfy the endorsed assessment guidelines of the Manufactured Mineral Products Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods which include direct observation of tasks should also include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Stakeholders	Stakeholders may include: • customer representatives • technical experts • regulators • refractory designer • refractory installer
Purpose of investigation	The purpose of the investigation may include: • routine monitoring of the 'wear and tear' deterioration of a refractory • investigation of suspected degradation of a refractory still in use • investigation of a catastrophic refractory failure • investigation to support an insurance or other claim • investigation requested by a third party (e.g. for a dispute) • technical investigation aimed at better understanding the refractory in use and so improving the refractory
Data collection	Data collection may include: • examining samples of failed refractory • collecting data of a refractory in use • collecting observations of a refractory in use • examining an entire refractory installation after it has been shutdown • one set of data collection or a planned series of data collection at specified intervals over a specified period
HSE risks	HSE risks may include: • exposure to heat • exposure to dust • confined space entry
Discussions with stakeholders	Discussions with stakeholders will vary depending on the purpose of the investigation, for example: • technical investigation - all relevant technical

RANGE STATEMENT	
	personnel - dispute investigation - discussions may be limited to discussions with client - claim investigation - discussions may be limited to discussions with client

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC557095A Specify and monitor the installation of monolithic_castable refractories

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers developing the specification for installing monolithic or castable refractories and then monitoring that installation to ensure it complies with the specification. It is intended for refractory experts who will most likely also have some management responsibility.

Application of the Unit

Application of the unit	This unit of competency requires the application of knowledge of refractory installation techniques to ensure the installation meets the requirements of the refractory. It covers the following types of refractory: • castable • mouldable and • gunned (shotcrete, gunitite). This unit does NOT cover the installation of block or precast refractories, refer to <i>PMC557096A Specify and monitor the installation of block/precast refractories</i>. While these techniques may also be used to make repairs, this unit may be used to include repairs using these techniques. The specification of the repair technique is covered in <i>PMC557097A Specify and monitor repairs to refractory installations</i>. This unit applies to individuals who may design a refractory installation and may also monitor the installation of refractory, or they may be installation specialists. They may be working in liaison with other refractory specialists or they may be the sole refractory specialist for this job/in their organisation. They will typically be liaising with a range of other technical experts as well as management and maybe accounts.

	This unit may apply to individuals working for an organisation which supplies and installs refractories, is a refractory consulting organisation or a client organisation which buys and uses the refractory.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Confirm design specification	1.1.Check design specification against agreed set of requirements for the refractory 1.2.Identify discrepancies or conflicts in requirements 1.3.Confirm installation requirements and specifications
2. Design installation	2.1.Determine method of installing refractory

ELEMENT	PERFORMANCE CRITERIA
process	2.2.Determine refractory materials to be installed 2.3.Determine mix requirements for materials 2.4.Determine installation equipment requirements 2.5.Determine anchor requirements 2.6.Determine post placement requirements 2.7.Design formwork if required 2.8.Design scaffolding or other internal access needs if required 2.9.Design external access/egress means if required 2.10. Identify installation health, safety and environment (HSE) hazards 2.11. Determine appropriate hazard controls 2.12. Check for discrepancies or conflicts in the designs and take appropriate action
3. Prepare for installation	3.1.Specify installation procedure 3.2.Liaise with relevant stakeholders 3.3.Modify specification if needed 3.4.Ensure correct ordering of requirements 3.5.Identify time critical items for the installation 3.6.Identify other items critical to the success of the project 3.7.Identify or develop measures to monitor all critical items 3.8.Prepare installation specification
4. Monitor installation	4.1.Ensure requirements meet specification/contract 4.2.Ensure hazard controls are in place and effective 4.3.Monitor work to installation specification 4.4.Take appropriate action on non-conformances as required 4.5.Report during project as required 4.6.Complete end of project documentation on completion

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

Required skills include:

- solving problems
- communicating at all levels
- using organisation knowledge system
- investigating
- analysing
- interpreting data
- negotiating
- technical reporting

Required knowledge

Required knowledge includes:

- properties of all common refractory materials
- installation methods
- anchors and anchoring systems
- installation equipment such as rams, vibrators and compactors
- post placement requirements for different refractory systems
- formwork design and construction
- scaffolding design and construction
- relevant terms
- relevant calculations
- project planning and management

Evidence 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 of this unit should include demonstrated competence in a workplace based project or a simulated workplace project.

Access should be available to all normally accessed

EVIDENCE GUIDE	
	tables, data etc which would be available to and used by a competent refractory specialist performing this assignment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to select an appropriate material and write the required specification.
Context of and specific resources for assessment	Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	• Assessment must satisfy the endorsed assessment guidelines of the Manufactured Mineral Products Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods which include direct observation of tasks should also include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy

EVIDENCE GUIDE

	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. Essential operating conditions that may be 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.

Method of installing refractory	Method of installing refractory may include one or more of: • casting • moulding of plastic refractory • gunning (shotcrete, gunite and gunned plastic refractory)
Refractory materials	Refractory materials may include one or more of: • cementitious refractories • plastic clay refractories • other refractories • fibre or fibre reinforced refractories such as: • ceramic fibre • steel fibre
Mix requirements	Mix requirements includes: • materials to be mixed • mixing ratios • location of mixing (e.g. in charge vessel, at nozzle or other location)
Installation equipment	Installation equipment may include one or more of: • vibrators • compactors • rams • gunning systems
Anchors	Types of anchors may include:

RANGE STATEMENT	
	• metal crook • metal Y • cast iron • ceramic • precast cones • hexmetal
Post placement requirements	Post placement requirements may include: • drying • curing • control of moisture and or temperature • striking of formwork • removal of scaffolding or other access/egress provisions
HSE hazards	HSE hazards may include: • exposure to heat • exposure to dust • exposure to refractory materials • confined space entry • working with equipment • working at heights • ultra-violet (UV) and other welding hazards • disposal of waste, scrap and excess materials • manual handling hazards
Hazard control	Appropriate hazard control should be determined by: • applying the hierarchy of control
Stakeholders	Stakeholders may include: • customer representatives • technical experts • regulators • refractory designer • materials and equipment suppliers • contractors
Requirements	Requirements include: • materials • equipment • contractors

RANGE STATEMENT	
Time critical items	Time critical items are those items which if not completed on time will cause the project to run overtime and may be determined from: - critical path analysis - long lead time items - other techniques
Installation specification	Installation specification should include: - technical specification - hazard controls and residual hazards - installation schedule - measures monitoring critical items
End of project documentation	End of project documentation may include: - operating and/or maintenance procedures - technical specification - routine monitoring requirements - project review report: - what was intended - what was achieved - achieved costs - achieved timing - significant project issues - possible improvements

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC557096A Specify and monitor the installation of block/precast refractories

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers developing the specification for installing block or precast refractories and then monitoring that installation to ensure it complies with the specification. It is intended for refractory experts who will most likely also have some management responsibility.

Application of the Unit

Application of the unit	This unit of competency requires the application of knowledge of refractory installation techniques to ensure the installation meets the requirements of the refractory. It covers the following types of refractory: • block • brick • precast. This unit does NOT cover the installation of monolithic/castable refractories, refer to <i>PMC557095A Specify and monitor the installation of monolithic/castable refractories</i>. While blocks/precast may also be used to make repairs, this unit may be used to include repairs using these techniques. The specification of the repair technique is covered in <i>PMC557097A Specify and monitor repairs to refractory installations</i>. This unit applies to individuals who may design a refractory installation and may also monitor the installation of refractory, or they may be installation specialists. They may be working in liaison with other refractory specialists or they may be the sole refractory specialist for this job/in their organisation. They will typically be liaising with a range of other technical experts as well as management and maybe accounts.

	This unit may apply to individuals working for an organisation which supplies and installs refractories, is a refractory consulting organisation or a client organisation which buys and uses the refractory.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Confirm design specification	1.1.Check design specification against agreed set of requirements for the refractory 1.2.Identify discrepancies or conflicts in requirements 1.3.Confirm installation requirements and specifications
2. Design installation	2.1.Determine refractory materials to be installed

ELEMENT	PERFORMANCE CRITERIA
process	2.2.Determine bond form to be used 2.3.Determine junctions and piers 2.4.Determine mortar requirements 2.5.Determine installation equipment requirements 2.6.Determine anchor requirements 2.7.Determine laying requirements 2.8.Design scaffolding or other internal access needs if required 2.9.Design external access/egress means if required 2.10. Identify installation health, safety and environment (HSE) hazards 2.11. Determine appropriate hazard controls 2.12. Check for discrepancies or conflicts in the designs and take appropriate action
3. Prepare for installation	3.1.Specify installation procedure 3.2.Liaise with relevant stakeholders 3.3.Modify specification if needed 3.4.Ensure correct ordering of requirements 3.5.Identify time critical items for the installation 3.6.Identify other items critical to the success of the project 3.7.Identify or develop measures to monitor all critical items 3.8.Prepare installation specification
4. Monitor installation	4.1.Ensure requirements meet specification/contract 4.2.Ensure hazard controls are in place and effective 4.3.Monitor work to installation specification 4.4.Take appropriate action on non-conformances as required 4.5.Report during project as required 4.6.Complete end of project documentation on completion

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

Required skills include:

- solving problems
- communicating at all levels
- using organisation knowledge system
- investigating
- analysing
- interpreting data
- negotiating
- technical reporting

Required knowledge

Required knowledge includes:

- properties of all common refractory materials
- block/precast installation methods
- installing for:
 - straight walls
 - corners
 - curves
 - roofs
 - arches
- anchors and anchoring systems
- installation equipment such as lifting and placement aids
- post placement requirements for different mortars
- scaffolding design and construction
- relevant terms
- relevant calculations
- project planning and management

Evidence Guide**EVIDENCE GUIDE**

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

EVIDENCE GUIDE	
Guidelines for the Training Package.	
Overview of assessment	Assessment of this unit should include demonstrated competence in a workplace based project or a simulated workplace project. Access should be available to all normally accessed tables, data etc which would be available to and used by a competent refractory specialist performing this assignment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to select an appropriate material and write the required specification.
Context of and specific resources for assessment	Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	• Assessment must satisfy the endorsed assessment guidelines of the Manufactured Mineral Products Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods which include direct observation of tasks should also include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred

EVIDENCE GUIDE	
	to other circumstances. Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Refractory materials	Refractory materials may include one or more of: - cementitious refractories - clay refractories - other refractories
Bond forms	Bond forms include: - stretcher bond - header bond - English bond - English garden wall bond - reverse bond - broken bond
Junctions and piers	Junctions include: - tie brick - special brick - squint brick Piers may be: - attached - detached - not needed Note: feather edge refractory bricks are not

RANGE STATEMENT	
	normally included
Mortar	Mortar includes: • hydraulic setting dry mixes • air setting dry mixes • heat setting dry mixes and may be: • clay • fireclay • chamotte • mortar
Installation equipment	Installation equipment may include one or more of: • equipment for lifting and placing precast blocks • temporary support for roofs and arches • spreader jacks
Anchors	Types of anchors may include: • anchor bolts • anchor mesh • retention clips
Post laying requirements	Post laying requirements may include: • drying • control of moisture and or temperature • removal of scaffolding or other access/egress provisions
HSE hazards	HSE hazards may include: • exposure to heat • exposure to dust • exposure to refractory materials • confined space entry • working with equipment • working at heights • ultra-violet (UV) and other welding hazards • disposal of waste, scrap and excess materials • manual handling hazards
Hazard control	Appropriate hazard control should be determined

RANGE STATEMENT	
	by: • applying the hierarchy of control
Stakeholders	Stakeholders may include: • customer representatives • technical experts • regulators • refractory designer • materials and equipment suppliers • contractors
Requirements	Requirements include: • materials • equipment • contractors
Time critical items	Time critical items are those items which if not completed on time will cause the project to run overtime and may be determined from: • critical path analysis • long lead time items • other techniques
Installation specification	Installation specification should include: • technical specification • hazard controls and residual hazards • installation schedule • measures monitoring critical items
End of project documentation	End of project documentation may include: • operating and/or maintenance procedures • technical specification • routine monitoring requirements • project review report: • what was intended • what was achieved • achieved costs • achieved timing • significant project issues • possible improvements

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC557097A Specify and monitor repairs to refractory installations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers developing the specification for a refractory repair and then monitoring that repair to ensure it complies with the specification. It is intended for refractory experts who will most likely also have some management responsibility.

Application of the Unit

Application of the unit	This unit of competency requires the application of knowledge of refractory materials, installation and failure modes to determine an appropriate repair method. It covers repairs to all types of refractories. This unit does NOT cover the investigation of refractory failures, refer to <i>PMC557094A Investigate refractory failures</i>. The units are obviously related and it may be appropriate to consider both concurrently. This unit applies to individuals who may design a refractory installation and may also monitor the installation of refractory, or they may be repair specialists. They may be working in liaison with other refractory specialists or they may be the sole refractory specialist for this job/in their organisation. They will typically be liaising with a range of other technical experts as well as management and maybe accounts. This unit may apply to individuals working for an organisation which supplies and installs refractories, is a refractory consulting organisation or a client organisation which buys and uses the refractory.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Confirm repair specification	1.1. Check repair specification against agreed set of requirements for the repair 1.2. Identify discrepancies or conflicts in requirements 1.3. Confirm repair requirements and specifications
2. Design installation process	2.1. Determine refractory materials to be repaired 2.2. Determine refractory material to be used in making the repair 2.3. Determine repair installation/application requirements 2.4. Determine installation equipment requirements 2.5. Determine anchor/keying/adhesion requirements

ELEMENT	PERFORMANCE CRITERIA
	2.6.Determine repair method 2.7.Determine post repair application requirements 2.8.Determine temporary support or shores required 2.9.Design formwork if required 2.10. Design scaffolding or other internal access needs if required 2.11. Design external access/egress means if required 2.12. Identify installation health, safety and environment (HSE) hazards 2.13. Determine appropriate hazard controls 2.14. Check for discrepancies or conflicts in the designs and take appropriate action
3. Prepare for installation	3.1.Specify repair procedure 3.2.Liaise with relevant stakeholders 3.3.Modify specification if needed 3.4.Ensure correct ordering of requirements 3.5.Identify time critical items for the installation 3.6.Identify other items critical to the success of the project 3.7.Identify or develop measures to monitor all critical items 3.8.Prepare repair specification
4. Monitor installation	4.1.Ensure requirements meet specification/contract 4.2.Ensure hazard controls are in place and effective 4.3.Monitor work to installation specification 4.4.Take appropriate action on non-conformances as required 4.5.Report during project as required 4.6.Complete end of project documentation on completion

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

REQUIRED SKILLS AND KNOWLEDGE

Required skills

Required skills include:

- solving problems
- communicating at all levels
- using organisation knowledge system
- investigating
- analysing
- interpreting data
- negotiating
- technical reporting

Required knowledge

Required knowledge includes:

- properties of all common refractory materials
- common installation methods and ways of repairing them
- common modes of refractory failure and their implications for repair
- anchors and anchoring systems used in repairs
- keying and adhesion methods used in repairs
- installation equipment such as lifting and placement aids and gunning equipment
- post placement requirements for different repairs
- formwork design and construction
- scaffolding design and construction
- relevant terms
- relevant calculations
- project planning and management

Evidence 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 of this unit should include demonstrated competence in a workplace based project or a simulated workplace project.

Access should be available to all normally accessed

EVIDENCE GUIDE	
	tables, data etc which would be available to and used by a competent refractory specialist performing this assignment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to select an appropriate material and write the required specification.
Context of and specific resources for assessment	Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	• Assessment must satisfy the endorsed assessment guidelines of the Manufactured Mineral Products Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods which include direct observation of tasks should also include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy

EVIDENCE GUIDE

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. Essential operating conditions that may be 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.

Refractory materials

Refractory materials may include one or more of:

- cementitious refractories
- clay refractories
- ceramic fibre
- other refractories

Repair methods

Repair methods include:

- cold repair
- hot repair
- direct repair
- controlled repair (e.g. through controlled gunning)
- repair from inside the vessel
- repair by injection through the vessel wall

Shores

Shores may include:

- dead shores
- raking shores
- flying shores

Installation equipment

Installation equipment may include one or more of:

- vibrators
- compactors
- rams
- gunning systems
- equipment for lifting and placing precast blocks
- temporary support for roofs and arches

RANGE STATEMENT	
	• spreader jacks
Anchors and keys	Types of anchors may include: • anchor bolts • through anchors • retention clips Keys include cut mechanical keys Adhesion may include: • chemical and other means of ensuring a bond between the repair and the refractory substrate
Post repair requirements	Post repair requirements may include: • drying • curing • control of moisture and/or temperature • striking of formwork • removal of scaffolding or other access/egress provisions
HSE hazards	HSE hazards may include: • exposure to heat • exposure to dust • exposure to refractory materials • confined space entry • working with equipment • working at heights • ultra-violet (UV) and other welding hazards • disposal of waste, scrap and excess materials • manual handling hazards
Hazard control	Appropriate hazard control should be determined by: • applying the hierarchy of control
Stakeholders	Stakeholders may include: • customer representatives • technical experts • regulators • refractory designer • materials and equipment suppliers • contractors

RANGE STATEMENT	
Requirements	Requirements include: • materials • equipment • contractors
Time critical items	Time critical items are those items which if not completed on time will cause the project to run overtime and may be determined from: • critical path analysis • long lead time items • other techniques
Repair specification	Repair specification should include: • technical specification • hazard controls and residual hazards • installation schedule • measures monitoring critical items
End of project documentation	End of project documentation may include: • operating and/or maintenance procedures • technical specification • routine monitoring requirements • project review report: • what was intended • what was achieved • achieved costs • achieved timing • significant project issues • possible improvements

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC557098A Specify refractory installation systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers developing the specification for a refractory installation system and ensuring it complies with the specification. It is intended for refractory experts who will most likely also have some management responsibility.

Application of the Unit

Application of the unit	This unit of competency requires the application of knowledge of refractory installation requirements, structures and mechanics to determine an appropriate installation system. It covers installation systems for both monolithic and block type installations as well as repairs. This unit does NOT cover the specification of the installation or repair, refer to relevant units. The units are obviously related and it may be appropriate to consider this unit concurrently with installation units. This unit applies to individuals who may design a refractory installation and may also monitor the installation of refractory. They may be working in liaison with other refractory specialists or they may be the sole refractory specialist for this job/in their organisation. They will typically be liaising with a range of other technical experts as well as management and maybe accounts. This unit may apply to individuals working for an organisation which supplies and installs refractories, is a refractory consulting organisation or a client organisation which buys and uses the refractory.

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. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Analyse installation/repair specification	1.1.Determine personnel access requirements 1.2.Determine equipment and material access requirements 1.3.Determine lifting and positioning requirements 1.4.Determine site restrictions 1.5.Determine restrictions caused by the refractory and/or job 1.6.Compile installation system requirements
2. Develop scaffolding requirements	2.1.Calculate required size of work platforms 2.2.Calculate load and load distribution on scaffold 2.3.Identify appropriate load bearing surfaces for

ELEMENT	PERFORMANCE CRITERIA
	scaffold base 2.4. Identify tie points for scaffold, if any 2.5. Select appropriate scaffold type for application 2.6. Develop draft scaffold specification 2.7. Check compliance of draft specification with regulations 2.8. Develop scaffolding requirements in liaison with a licensed scaffolder or scaffold supplier 2.9. Identify scaffold related health, safety and environment (HSE) hazards 2.10. Determine appropriate hazard controls 2.11. Check for discrepancies or conflicts and take appropriate action
3. Develop lifting and/or supporting requirements	3.1. Calculate loads to be lifted/supported 3.2. Calculate loads on supports and running gear 3.3. Determine support needs during placement of refractory or equipment 3.4. Calculate impact on loads of placement needs 3.5. Determine design loads 3.6. Select appropriate lifting/supporting means 3.7. Check compliance with any relevant regulation 3.8. Modify scaffold specification if required 3.9. Identify lifting/supporting related HSE hazards 3.10. Determine appropriate hazard controls 3.11. Check for discrepancies or conflicts and take appropriate action 3.12. Prepare lifting/supporting specification
4. Ensure installation system complies with specification	4.1. Liaise with contractors and others to ensure specifications are understood 4.2. Implement checking mechanisms to ensure system complies with specification 4.3. Take appropriate action on non-conformances as required 4.4. Report during project as required 4.5. Complete end of project documentation on completion

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- solving problems
- communicating at all levels
- using organisation knowledge system
- investigating
- analysing
- interpreting data
- negotiating
- calculating
- technical reporting

Required knowledge

Required knowledge includes:

- properties of all common refractory materials
- common installation methods
- scaffolding systems and regulations
- lifting/hoisting/supporting systems and regulations
- structures, moments and beam reactions
- point vs. distributed loads
- mechanics of levers, pulleys and jacks
- tension, compression, shear and torsion
- relevant terms
- relevant calculations

Evidence 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 of this unit should include demonstrated competence in a workplace based project or a simulated

EVIDENCE GUIDE	
	workplace project. Access should be available to all normally accessed tables, data etc which would be available to and used by a competent refractory specialist performing this assignment.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to select an appropriate material and write the required specification.
Context of and specific resources for assessment	Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
Method of assessment	• Assessment must satisfy the endorsed assessment guidelines of the Manufactured Mineral Products Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods which include direct observation of tasks should also include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.

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. Essential operating conditions that may be 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.

Restrictions caused by refractory/ job

Restrictions caused by refractory include:

- fragility preventing use as a footing
- need to refractory clad area being used for support
- lack of tie points
- low coefficient of friction making it unsuitable for support

Types of scaffold

Types of scaffold include:

- trestle scaffold
- tower scaffold
- putlog scaffold
- independent scaffold
- working platforms

HSE hazards

HSE hazards may include:

- access/egress restrictions
- ventilation restrictions
- moving objects/loads
- cables under tension

Hazard control

Appropriate hazard control should be determined by:

- applying the hierarchy of control

Lifting supporting means

Lifting supporting means include:

- gin wheel

RANGE STATEMENT

	• scaffold crane • elevator • scissor lift • fixed hoist

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		

PMC561072C Store materials for production

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the storing and monitoring of materials. It involves checking and maintaining materials and equipment, undertaking visual checks and following workplace procedures.

Application of the Unit

Application of the unit	This unit competency is typically performed by operators working either independently or as part of a work team. If the ability to sample and test materials is part of the job requiring this competency, then the appropriate sampling and testing competencies must also be achieved. The application of this unit will vary according to the batch requirements, range of equipment, technology and the varied range of process procedures within an enterprise. The storage will probably be on or adjacent to the plant or equipment which is about to use the materials.

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. Store materials	1.1. Check quantity, quality and transfer of materials 1.2. Store materials safely in designated locations 1.3. Transfer materials using appropriate equipment according to enterprise requirements and using good occupational health and safety (OHS) procedures 1.4. Complete all necessary documentation/records
2. Monitor material in storage	2.1. Check and maintain supplies of materials 2.2. Check physical and chemical state of stored materials 2.3. Check equipment used to keep stored materials in required state 2.4. Take action required by procedures to keep required level and quality of stored materials
3. Check stored materials	3.1. Sample materials as required 3.2. Check quality of materials as required 3.3. Visually check that bins/hoppers/tanks are free from

ELEMENT	PERFORMANCE CRITERIA
	contamination 3.4. Take actions required by procedures/work instructions

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 variance from specifications and then determining an appropriate action that is consistent with operating guidelines
- 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 process
- reading and numeracy to:
 - interpret workplace documents and technical information
 - check quantity of materials to be transferred and stored

Required knowledge

Required knowledge includes:

- principles of safe and efficient storage
- material characteristics
- impact of contamination
- hazard identification
- transfer system
- testing procedures
- distinguishing between causes of faults such as:
 - different materials
 - equipment (electrical, mechanical and manual)
 - contamination

Evidence 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 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 implementing appropriate corrective action.

Consistent performance should be demonstrated. In particular look to see that:

- materials are safely and efficiently stored to specification
- materials are correctly transferred to designated locations
- quantity of materials in storage are to required level
- problems (e.g. supply and demand of materials, contamination) are anticipated and appropriate action is taken.

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.

EVIDENCE GUIDE	
Method of assessment	It would be desirable to assess this unit concurrently with MSAC112003A Undertake manual handling unless competency has already been achieved in this unit. 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 storage facilities	Equipment and storage facilities may include: • motorised rail and road vehicles • mechanical handling equipment including front end loaders • computers • hand tools and safety equipment • mechanical and computerised measuring devices • bunkers, silos, bins/hoppers, weigh bins, tanks and portable tanks • flammable stores
Materials	Materials may include: • materials supplied from an external source • materials/chemical mix produced internally for secondary process

RANGE STATEMENT	
Typical problems	Typical problems may include: • material specifications • contamination of stored stock • quality of received materials • equipment failure
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		

PMC561080B Organise self

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the setting of individual work priorities. It involves identifying individuals work activities, recording activities as required, locating relevant work instructions and undertaking tasks in accordance with work plans.

Application of the Unit

Application of the unit	This competency is typically performed by operators who may be working individually or as part of a team. The setting of individual work priorities is within clearly identified team targets or the overall schedule of production. This unit of competency depends upon the application of: • communication procedures used within each enterprise • established work practices.

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 work activities	1.1. Identify individual work activities that have been allocated 1.2. Prioritise work activities as directed
2. Organise daily work activities	2.1. Break down work activities into small achievable components 2.2. Record activities as required by procedures/work instructions
3. Follow work plan	3.1. Locate relevant procedures/work instructions 3.2. Undertake tasks in accordance with schedule/plan and procedures/work instructions 3.3. Maintain output in accordance with schedule/plan 3.4. Follow prescribed and routine work related sequences 3.5. Identify situations which might make following the plan difficult and review plan with appropriate personnel

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- planning daily work activities in order to meet timelines
- implementing enterprise's standard procedures and work instructions and relevant regulatory requirements within appropriate time constraints and in a manner relevant to giving and following instructions
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- correct work activities against given work plan
- completion of work activities in a timely and efficient manner
- achievement of output in accordance with work plan/schedule
- distinguishing between urgent and non-urgent tasks

Evidence 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

Competence must be demonstrated in the ability to identify work activities and prioritise work in order to meet timelines.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- activities are planned in accordance with instructions
- relevant procedures are accessed and utilised in completing activities
- timelines are adhered to

EVIDENCE GUIDE	
	assistance is sought from relevant personnel when difficulties arise.
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.
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
Information sources and documentation	This unit may vary according to the enterprise's use of the following information sources and documentation: procedures and work instructions

RANGE STATEMENT	
	- materials safety data sheets (MSDS) - job cards - maintenance logs - plant drawings
Typical problems include:	Typical problems may include: - required information/materials not available - required tool/equipment not available - conflict in job priorities
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		

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**

PMC562071C Operate bulk materials handling equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the operation of the range of equipment used to store and convey bulk, particulate materials.

Application of the Unit

Application of the unit	This unit of competency covers the operation of conveyor belts, pneumatic conveyors and the like which are moving bulk particulate solids (particulates). It is not intended to apply to conveying packages materials nor to assembly line conveyors. It also covers the storage of bulk particulates, in silos/hoppers or as piles of particulates on the ground. This unit of competency is typically performed by operators working either independently or as part of a work team. It includes the recognition, operation and troubleshooting of routine plant items.

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. Operate conveyors	1.1. Recognise the type and number of conveyors 1.2. Identify hazards and implement hazard controls according to procedures 1.3. Start up and shut down the conveyor in a manner appropriate to the conveyor type and duty 1.4. Complete routine checks, logs and paperwork, taking action on unexpected observations, readings and trends 1.5. Convey correct material from and to the correct location as required
2. Manage bulk material storages	2.1. Recognise type of storage facility 2.2. Monitor quality, quantity and location of bulk materials stored 2.3. Transfer stock into, out of and between storage as required 2.4. Supply internal and external customers with correct quality and quantity in a timely manner 2.5. Make effective use of storage capacity available taking account of safety issues
3. Rectify problems	3.1. Identify the range of faults that can occur during the

ELEMENT	PERFORMANCE CRITERIA
	operation 3.2. Determine and rectify fault causes in accordance with established enterprise procedures 3.3. Identify and rectify equipment failure causes in accordance with established enterprise procedures 3.4. Make sure appropriate records and log books of equipment operations are maintained to meet enterprise requirements 3.5. Identify non-routine problems and report according to procedure
4. Carry out maintenance procedures	4.1. Recognise a maintenance need according to procedure 4.2. Isolate materials handling equipment and prepare for maintenance/vessel entry as required 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 material handling 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:

- selecting, using and maintaining relevant personal protective equipment (PPE)
- implementing good operating practice
- operating bulk materials handling equipment
- transferring and conveying materials to correct locations

REQUIRED SKILLS AND KNOWLEDGE

- 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
- principles of operation
- physics of operation
- properties of particulates
- density and bulk density
- methods of resolving problems
- distinguish between causes of problems such as:
 - material
 - instrument
 - equipment (electrical/mechanical)
 - maintenance
- isolate problem to item of equipment
- understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines
- relevant OHS 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 bulk materials handling equipment
- enterprise standard operating 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

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

Competence must be 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

EVIDENCE GUIDE	
	analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a problem. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment in need of attention/with potential problems are recognised • action is taken to ensure equipment is returned to full performance in a timely manner • obvious problems in other plant areas are recognised and an appropriate contribution made to a solution • items initiated are followed through until final resolution has occurred. 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	Where the completion of this unit requires working under a permit/clearance then competency must also be established in MSAPMPER200C Work in accordance with an issued permit or other appropriate unit. 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

Equipment may include:

- mechanical conveyors/feeders:
 - travelling stackers
 - belt
 - vibrating
 - screw
 - flight
- pneumatic conveyors:
 - dense phase
 - disperse phase
 - pressure
 - vacuum
- bulk storage:
 - piles
 - bunkers
 - silos
 - bins/hoppers
 - weigh bins/loss in weight bins

Particulate solids

Particulate solids may include:

- cement
- sand
- aggregate
- frit
- cullet
- asphalt (not strictly a particulate solid but included in this unit)
- other

RANGE STATEMENT	
	Particulate solid properties include: - particle size and shape: reactivity, solubility, colour, health and safety - angle of repose - storage and transport - angle of slide - transport - dusts - hazards and good practice
Typical problems	Typical problems may include: - contamination of stored stock - rat holing and bridging in silos/bins/hoppers - routing issues - equipment problems
Personal protective equipment	All operations must be performed using the appropriate personal protective equipment (PPE), including breathing protection
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	

Co-requisite units		

PMC562075B Maintain kiln refractory

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the removal and replacement of a kiln refractory. It involves preparing and assembling appropriate plant and equipment, removing and replacing refractory and brickwork according to procedures and completing relevant records.

Application of the Unit

Application of the unit	This unit of competency is intended for simple kiln refractory maintenance such as may be performed by trained operators. It is intended to apply to one example of a refractory lined kiln only. For more general refractory lining competencies refer to the relevant refractories units (PMC552090 - 2095). This unit of competency is typically performed by more experienced operators working either independently or as part of a work team. The competency covers the removal and replacement of a kiln refractory and also covers the preparation of materials and the removal of waste from repairs.

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. Prepare for refractory replacement	1.1. Prepare and assemble, in accordance with specified requirements, materials used for the replacement of refractory 1.2. Prepare and assemble appropriate plant and equipment in accordance with specific needs and manufacturer's operating instructions 1.3. Notify appropriate personnel and ensure that required permits have been obtained
2. Replace refractory	2.1. Ensure that the removal of refractory and brickwork is performed in accordance with standard procedures/work instructions 2.2. Ensure that brickwork/refractory is replaced following standard procedures and work instructions 2.3. Ensure that waste from repairs to kiln is removed and disposed of correctly

ELEMENT	PERFORMANCE CRITERIA
	2.4. Complete all records and permit 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 variance from specification and then analysing the problem to determine the level of appropriate action required, which is consistent with operating guidelines
- 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 process
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- safe work practices
- function of tools/equipment used
- procedures used to prepare the kiln
- procedures used to install refractory
- first-line maintenance procedures required
- correct removal and replacement of refractory and brickwork
- correct preparation and assembly of materials and tools/equipment used
- safely remove waste from repairs to kiln
- distinguish between causes of faults such as:
 - refractory materials
 - refractory problems

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 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 implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • replacement follows standard procedures • correct materials are used • permit and other health and safety procedures are followed. 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
Equipment	Equipment may include: • protective clothing, hearing protection, safety glasses and adequate ventilation • hand and power tools • mobile plant • refractory support mechanisms
Variations	This unit may vary according to: • length and type of kiln • the type of process, i.e. dry, wet, semi-wet, semi-dry • type of kiln maintenance being performed • method of waste disposal
Typical problems include:	Typical problems may include: • furnace/kiln problems • major refractory problems
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		

PMC562081B Deliver customer service

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the delivery of customer service in the workplace. It involves identifying customer requirements, ensuring products meet customer requirements, dealing with customer requests and identifying areas for improvement.

Application of the Unit

Application of the unit	This unit of competency applies to operators who also deal directly with the customer. While the customer may be internal, it is intended for external customers. Operators may deal directly with customers as part of order taking or product delivery (e.g. in the premixed concrete sector) or as part of complaint investigation and resolution. This does not deal directly with complaint handling. This unit of competency is typically performed by operators, working either independently or as part of a work team who apply a range of routine tasks. It involves identifying, responding and improving customer service for both internal and external customers.

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 customer requirements	1.1. Identify company/team objectives and key performance indicators (KPIs) in meeting internal and external customer requirements 1.2. Explain the role of the quality system in meeting customer requirements 1.3. Identify the role of the individual and the team in meeting these requirements
2. Respond to customer requirements	2.1. Use effective questioning and listening techniques to identify customer requirements 2.2. Use quality assurance systems to ensure products and services meet customer requirements 2.3. Display a helpful and courteous attitude when responding to customer enquiries 2.4. Ensure up to date advice and product knowledge is supplied to customers

ELEMENT	PERFORMANCE CRITERIA
	2.5.Deal with all customer requests in a timely manner 2.6.Complete all company documentation/records 2.7.Follow up customer requests and provide feedback to customers
3. Improve customer service	3.1.Identify methods of improving customer service and make recommendations to appropriate personnel for improvements 3.2.Implement improvements in customer service 3.3.Provide reports and appropriate feedback in accordance with company 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:

- effective questioning and answering techniques
- effective interpersonal skills
- communicating to convey meaning clearly, concisely and coherently
- literacy skills to communicate with customers
- numeracy skills to interpret customer requirements and to meet customer needs
- problemsolving skills to deal with customer enquiries or complaints
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- company products and services and quality procedures as it applies to customer requirements
- understanding of process, normal operating parameters and product quality
- relevant occupational health and safety (OHS) and environmental requirements and an ability to implement them is required
- organisational procedures and work instructions 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, 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	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. In particular, look to see that: • customer requirements are accurately assessed • customer requirements are completed within the necessary timelines • appropriate documenting of the customer request is undertaken • quality of customer service is evaluated • enterprise procedures for identifying and suggesting improvements are followed • customer complaints are effectively attended to.
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	This unit may be assessed in conjunction with: • MSAPMSUP100B Apply workplace procedures • MSAPMSUP200AAchieve work outcomes. 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	All operations are performed in accordance with standard procedures and work instructions
Customers	Customers may be: internal or external
Communications	Communications may include: - telephone - two way radio - computer equipment - face-to-face interaction
Plant documentation	Plant documentation may include: - organisational policies - standard operating procedures and work instructions - quality documentation - company business objectives and KPIs
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		

PMC562083C Allocate and complete team tasks

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the identification of team goals, working in a team to achieve them, and the completion of individual tasks.

Application of the Unit

Application of the unit	This unit of competency covers working in teams for all sectors of the industry. It is a goal oriented team unit requiring the individual to contribute to the team in a way which helps the team meet its goals. The team may be a formal team or an ad hoc work group. This competency is typically performed by operators who work within a team structure, with limited discretionary powers.

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 tasks for team	1.1. Identify team goals with team members 1.2. Identify tasks required to achieve goals 1.3. Identify team and individual safety responsibilities 1.4. Allocate responsibilities of individuals within the team, in discussion with the team 1.5. Ensure designated team goals are met
2. Organise individual daily work plan	2.1. Correctly estimate time and resources needed to complete tasks safely 2.2. Renegotiate responsibilities to meet changes in the workplace 2.3. Seek assistance from other team members when needed to meet team goals
3. Participate in team	3.1. Acknowledge information and feedback provided by other team members in the work group 3.2. Provide support to colleagues to ensure designated team goals are met 3.3. Evaluate the team's performance according to its goals

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 enterprise's standard procedures and work instructions within appropriate time constraints and in a manner relevant to the operation of the system
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- effective use of teamwork
- impact of individual team member strengths/weaknesses/competencies on the allocation of responsibilities and achievement of team goals
- occupational health and safety (OHS) roles and responsibilities of the individual and the team
- effective use of workplace documentation
- prioritisation and delegation of team activities to meet designated goals
- team and individual goals
- understanding of the organisation's information systems, procedures and equipment sufficient to participate in the allocation and completion of team tasks

Evidence 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

Competence must be demonstrated in 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. In

EVIDENCE GUIDE	
	particular look to see that: • there is a willingness to participate as part of a group • there is an understanding of teamwork • there is an understanding of how individual task completion affects team objectives • support is sought from and given to colleagues to achieve team objectives • allocated tasks are completed safely and within timelines • relevant procedures are found and used in completing activities.
Context of and specific resources for assessment	Assessment in this competency unit may vary depending upon: • type of communication used within each enterprise • established work practices • size and structure of the teams • team goals - individual, section and enterprise. 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	This unit may be assessed in conjunction with: • MSAPMSUP280A Manage conflict at work. 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
Information sources and documentation	This competency unit may vary according to the enterprise's use of the following information sources and documentation: • procedures/work instructions • materials safety data sheets (MSDS) • job cards • maintenance logs • plant drawings
Typical problems	Typical problems may include: • required information/materials not available • required tool/equipment not available • conflicting priorities • competency mix in team • short timeframe
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		

PMC563081C Carry out stock control

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers monitoring and reordering of stock to effectively control the purchase of stock for production. It involves maintaining stock levels, reporting stock variations, liaising with suppliers and facilitating stock control changes.

Application of the Unit

Application of the unit	In a typical scenario, a senior operator, or supervisor in a large plant looks after the monitoring and reordering of stock. This is likely to be as part of their broader role and may be done by an individual working alone or as part of a work team. Stock levels may be monitored visually (e.g. stock on a shelf/on the floor) or may be via a computer which is updated as stock is used, or other means. Stock may be in a store, warehouse or locally in the plant.

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 stock reordering	1.1. Monitor stock levels and maintain them at optimum levels 1.2. Adjust stock reorder levels as required in response to customer demand 1.3. Report to suppliers variations to quality and quantity of delivered goods 1.4. Identify alternative suppliers which meet required quality and safety standards and utilise them when required 1.5. Reorder stock in compliance with procedures
2. Maintain inventory records systems	2.1. Maintain accurate records of the storage and the movement of stock 2.2. Identify, and act upon, stock discrepancies 2.3. Ensure minimum inconvenience to customers resulting from stock movements
3. Undertake stocktaking and cyclical counts	3.1. Coordinate stocktaking and cyclical counts as required 3.2. Interpret inventory data and confirm it matches stock 3.3. Reconcile inventory data with actual stock on hand 3.4. Report stock variations or shortages 3.5. Identify missing or damaged stock and report as

ELEMENT	PERFORMANCE CRITERIA
	required by procedures
4. Control hazards	4.1. Identify hazards in the 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
5. Respond to problems	5.1. Identify possible problems in stock levels, storage, quantity and quality of stock, timeliness of supplies and production issues 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 section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- maintaining accurate stock levels
- acting upon discrepancies
- ensuring stock availability for meeting production needs
- implementing enterprise's standard procedures and work instructions and relevant regulatory requirements within an appropriate timeframe and in a manner relevant to a smooth work flow and production requirements
- reading and numeracy to interpret workplace documents and technical information

Required knowledge

Required knowledge includes:

- production requirements and stock availability
- effective inventory management techniques to meet production requirements
- accuracy of inventory

REQUIRED SKILLS AND KNOWLEDGE

- supplier contractual requirements
- stock control techniques
- stock optimum levels and relationship with cost
- relevant enterprise information systems in the reordering and monitoring of stock control
- methods of rectification for variations to quality and quantity of delivered goods
- method for sourcing alternative suppliers

Evidence 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 system be understood and that the importance of inventory management in relation to effective production planning 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:

- stock levels are accurate, discrepancies are acted upon and stock levels are maintained
- variations to quality and quantity of delivered goods are rectified
- alternative suppliers can be sourced on request
- stock is on hand to ensure efficient production.

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.

EVIDENCE GUIDE	
	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. 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	This unit of competency includes all such items of equipment and unit operations which form part of the stock control system. These may include: - enterprise inventory system, which may be paper or computer based - scanners - enterprise inventory practices and procedures - production planning and scheduling
Typical problems	Typical problems may include:

RANGE STATEMENT	
	• stock discrepancies between inventory system and actual stock on hand • deviations from supplier contracts/performance agreements • stock control and production planning discrepancies • stock quality and/or quantity does not meet production standards
Occupational health and safety (OHS)	The identification and control of hazards and the application of OHS are to be in accordance with current, applicable legislation and regulations, and company procedures

Unit Sector(s)

Unit sector	Support

Competency field

Competency field	

Co-requisite units

Co-requisite units		

LMTGN5004A Manage installation and commissioning of equipment and systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor This unit covers the skills and knowledge required to manage the installation and commissioning of equipment and systems used in a textiles, clothing and footwear (TCF) workplace.

Application of the Unit

Application of the Unit This unit applies to the management of the installation and commissioning of equipment and systems used in a TCF workplace where significant judgement is required in planning, technical or supervisory activities related to operations or processes. The work may involve individual and team related activities, and can include liaison with specialist technicians or contractors. Work may be conducted in a large scale production or small business situation in a TCF sector

The unit may relate to on-shore or off-shore applications; it would include all local requirements and may include establishing a new production line.

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

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

This unit requires the application of skills associated with communication to interpret specifications and technical information and prepare work-plans, budgets and contracts relating to equipment and systems. Knowledge of the technology is required to make assessments about commissioning processes and report and document information. Planning and organising, initiative and enterprise and problem solving are required to coordinate, problem solve and monitor installation processes and achievement of performance targets.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

Employability Skills Information

Employability Skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare work plan and specification document	1.1 Items to be included in work plan and specification document are identified and confirmed 1.2 Work plan for installation and commissioning of equipment and systems is drawn up, including management and reporting procedures 1.3 Specification document is prepared according to workplace and/or manufacturer procedures
2 Coordinate and	2.1 Contract arrangements for the installation and commissioning of

ELEMENT	PERFORMANCE CRITERIA
monitor contract arrangements	equipment/systems, including all legal, insurance and safety requirements, are coordinated in accordance with workplace and/or legislative procedures 2.2 Contract arrangements are monitored to ensure compliance with requirements and variations dealt with according to agreed strategy
3 Manage schedules and budgets	3.1 Information is gathered to establish adherence to schedule and budget forecasts 3.2 Deviation from performance targets is monitored and corrective action taken, if and where necessary 3.3 Scheduling and budgeting processes are assessed to determine whether variations or alternative plans are indicated
4 Administer legal, environmental and OHS requirements	4.1 Legal, environmental and OHS requirements related to installation and commissioning of equipment/systems are defined 4.2 Monitoring of the process is assessed to ensure compliance
5 Assess and report on work completion	5.1 Completed work is assessed to confirm all specifications have been incorporated 5.2 Report on work completed is prepared in accordance with workplace practices
6 Maintain records	6.1 Records are maintained of installation and commissioning activities in accordance with workplace practices

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level

Demonstrates knowledge of:

- appropriate installation and commissioning procedures
- OHS considerations and environmental factors
- contract requirements
- safety and environmental aspects of relevant enterprise activities
- workplace practices and reporting/recording processes
- relevant regulatory requirements and codes of practice
- relevant OHS legislation, regulatory requirements and codes of practice
- carry out work in accordance with OHS practices
- hazard identification and control measures associated with managing installation and commissioning of equipment and systems

REQUIRED SKILLS AND KNOWLEDGE

Demonstrates skills to:

- monitor contract arrangements, scheduling and budgets
- manage the application of technical skills by other personnel
- communicate effectively within the workplace, including liaising with other departments
- establish or interpret procedures, where required
- determine report requirements and present information in appropriate formats
- read, interpret and follow information on job instructions, specifications, standard operating procedures, patterns, charts, tickets, order forms and other applicable reference material
- sequence operations
- clarify and check task related 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 the Training Package.

Critical aspects of evidence to be considered

Assessment must confirm appropriate knowledge and skills to:

- develop and prepare work plan and specification documents
- organise and monitor contract arrangements
- assess scheduling and budgeting procedures
- implement legal, environmental and OHS obligations/requirements
- ensure completed work meets specifications
- maintain accurate records

Consistency in performance

Applies underpinning knowledge and skills when:

- organising work
- managing activities and personnel
- completing tasks
- identifying improvements
- applying safety precautions relevant to the task
- assessing operational capability of specified equipment used and work processes
- shows evidence of application of relevant workplace practices including:
- hazard policies and procedures including codes of practice

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.

Resource implications	• job procedures and work instructions • quality procedures (where existing) • waste, pollution and recycling management processes • action taken promptly, accidents and incidents reported in accordance with statutory requirements and workplace practices • recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions among staff and others • work completed systematically with attention to detail without damage to goods, equipment or personnel • access to real or appropriately simulated situations involving the management of the installation and commissioning of equipment and systems used in a TCF context • this includes real or simulated work areas, materials, equipment, and information on work specifications, manufacturer's instructions, relevant safety procedures and regulations, quality standards, workplace practices and customer requirements
Context for assessment	Assessment may occur on the job or in an appropriately simulated environment
Interdependent assessment	This unit does not necessarily need to be assessed in conjunction with other units and can be assessed independently

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Legislative/regulatory requirements	All work must comply with relevant Federal and State or Territory legislative or regulatory requirements, organisation insurance requirements, OHS legislation, manual handling procedures and relevant health regulations.

Equipment and systems may include:	• microprocessor or computer control • production and facility equipment used within the enterprise
Workplace practices may include:	• workplace practices relating to managing installation and commissioning of equipment and systems • conditions of service, legislation and industrial agreements including workplace agreements and awards and Federal or State/Territory legislation • standard work practices • reporting verbally or in writing • oral, written or visual communication • being responsible for the maintenance of own work quality and contributing to the quality improvement of team or section output, where necessary • safety, environmental, housekeeping and quality practices as specified by machine and equipment manufacturers, regulatory authorities and the organisation
Workplace OHS practices may include:	• use of personal protective wear and equipment • safe materials handling practices • taking of rest breaks • ergonomic arrangement of workplaces • following marked walkways • storage of equipment • workstation housekeeping • cleaning of equipment • workers' compensation legislation

Unit Sector(s)

Sector All

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

MNMC205A Conduct local risk assessment

Modification History

Unit Descriptor

This unit covers the skills and knowledge required to apply basic **risk** control processes at a mine site. It includes the identification of **hazards**; assessing **risk**; identifying unacceptable **risk**; identifying/analyzing and implementing **risk treatment**; and completing records and reports.

Links outside this unit

The work covered in this unit relates to the Australian Standard AS/NZS 4360 **Risk Management**

The work described in this unit is equivalent to MNCC1006A Conduct local risk control.

Application of the Unit

Licensing/Regulatory Information

Pre-Requisites

Employability Skills Information

The required outcomes described in this Unit of Competency contain applicable facets of employability skills. The Employability Skills Qualification Summary for the qualification in which this Unit of Competency is packaged will assist in identifying employability skill requirements.

Elements and Performance Criteria Pre-Content

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Identify hazards	1.1 Analyse work area conditions to identify/recognise potential hazards in the workplace 1.2 Access and analyse relevant safety systems information to eliminate situations covered by

- existing and adequate procedures
- 1.3 Recognise the type and scope of unresolved hazards and their likely impact
 - 2 Assess risk and identify unacceptable risk
 - 2.1 Evaluate 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 Evaluate risk against criteria to identify if it warrants '**unacceptable risk**' status and either action or refer to the appropriate party
 - 3 Identify, analyse and implement risk treatments
 - 3.1 Identify and consider all possible **risk treatment** options
 - 3.2 Identify feasible options by preliminary analysis and consideration of possible options
 - 3.3 Analyse feasible 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 course of action
 - 4 Complete records and reports
 - 4.1 Communicate information on the course of action and implementation to the relevant people
 - 4.2 Complete **records and reports** for hazards and actions from personal risk assessment as specified by legislative and site requirements

Required Skills and Knowledge

Evidence Guide

Critical Aspects of Evidence

The evidence required to demonstrate this competency must be relevant to mine site operations. In addition to satisfying the requirements of all elements, performance criteria, required knowledge and skills, evidence must include demonstration of:

knowledge of procedures, requirements and instructions to conduct local risk assessment appropriate to a mine site, and;

implementation of appropriate procedures and techniques for the efficient and effective conduct local risk assessment appropriate to a mine site, while complying with site safety, environmental, quality and communication requirements. This will include:

identifying hazards

assessing risk and identifying unacceptable risk

identifying, analysing and implementing risk treatments

completing records and reports

Required Knowledge

Specific knowledge is required to achieve the performance criteria in this unit to the standards of performance required in the workplace, to transfer the skills to other contexts and to deal with unplanned events. Assessment requires evidence of the ability to identify and explain the purpose of:

risk management processes and methods, including: identifying hazards, assessing risks, determining acceptability of risks, identifying controls

mine site risk management procedures

mine site safety systems information

mine site communication, reporting and recording procedures

Required Skills

Specific skills are required to achieve the performance criteria in this unit. Assessment needs to obtain evidence of the ability to:

proactively identify hazards

take action in response to risks

Assessment and Interdependence of Units

This unit may be assessed with other relevant units forming a cohesive work function, according to specific mine site requirements.

Resource Implications

Assessment of this competency requires typical resources normally used in a mine site work environment. Selection and use of resources for particular mine sites may differ due to mine site conditions, equipment availability, equipment/plant types and different contexts.

Consistency in Performance

To ensure consistency of performance, this unit may be assessed over a period of time and a range of work and site conditions. Local site factors will influence the breadth of evidence required to demonstrate the competency.

Context for Assessment

This unit should be assessed in the work environment where possible. Some assessment events may be conducted under simulated conditions where issues of safety and/or environmental damage are limiting factors.

All assessments must be valid, reliable, fair, flexible and sufficient evidence should be accumulated to demonstrate the required competence.

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.

Methods of Assessment

Appropriate methods of assessment for this unit will usually include:

observation of processes and procedures

oral and/or written questioning on required knowledge and skills

testimony from supervisors, colleagues, clients and/or other appropriate persons

simulation and/or scenario analysis

Where performance is not directly observed and/or is required to be demonstrated over a period of time and/or in a number of locations, any evidence should be authenticated by colleagues, supervisors, clients or other appropriate persons.

Questioning should be undertaken in such a manner as is appropriate to the language and literacy levels of the candidate and to the requirements of the unit of competency.

Range Statement

RANGE STATEMENT

The following range of variables is subject to site-specific operations, but is not limited to the following details. Site procedures, regulations and occupational health and safety and other relevant legislation apply to all elements and performance criteria.

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. (AS/NZS 4360:1999 **Risk Management**)

Hazard is defined as:

a source of potential harm or a situation with a potential to cause loss. (AS/NZS 4360:1999 **Risk Management**)

Risk treatment is defined as:

selection and implementation of appropriate options for **dealing with risk**. (AS/NZS 4360 **Risk Management**)

Hazards may include:

equipment

methods/plans

people

the work environment

Consequence is defined as:

the outcome of an event expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain. There may be a range of possible outcomes associated with an event (AS/NZS 4360:1999 **Risk Management**).

Frequency is defined as:

a measure of the rate of occurrence of an event expressed as the number of occurrences of an event in a given time. (AS/NZS 4360:1999 **Risk Management**)

Likelihood is used as:

a qualitative description of probability and frequency. (AS/NZS 4360:1999 **Risk Management**)

Probability is defined as:

the likelihood of a specific outcome, measured by the ratio of specific events or outcomes to the total number of possible events or outcomes. Probability is expressed as a number between 0 and 1, with 0 indicating an impossible event or outcome and 1 indicating an event or outcome is certain. (AS/NZS 4360:1999 **Risk Management**)

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's/OCE reports

incident reports

near-miss reports

shift reports

Unit Sector(s)

MSACMC411A Lead a competitive manufacturing team

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed by people who lead teams in a competitive manufacturing environment. The team may be operating in manufacturing or in a manufacturing support function e.g. maintenance, office, warehousing etc.

Application of the Unit

Application of the unit	In a typical scenario, the team leader in a <i>competitive manufacturing</i> organisation needs to integrate a range of knowledge and skills. The team leader must lead and assist team members to understand and apply a holistic view of their job and the team's role within the organisation and the objectives that the team must meet as part of the competitive manufacturing system used by the enterprise. This unit requires the application of skills associated with communication, teamwork, problem solving, initiative, enterprise, planning, organising and self management in order to provide leadership in a competitive manufacturing team. This unit has a strong emphasis on planning and implementation, but also requires an ability to learn from experience and feed new information back into strategies to improve both the team's and own performance.

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. Facilitate the development of process and competitive manufacturing knowledge	1.1.Ensure necessary technical documentation and information about the process and <i>competitive manufacturing</i> is available to the team 1.2.Develop mentoring processes for team members 1.3.Structure team activities in a way which facilitates the ongoing development of the skills and knowledge of team members 1.4.Arrange for the provision of workforce development and training for team members as appropriate 1.5.Encourage team members to apply technical knowledge to the process.
2. Facilitate efficiency improvements in team activities	2.1.Ensure <i>budgets, operating procedures</i> and other related documentation is available to the team 2.2.Assist team members apply this information to the process responsibilities of the team 2.3.Encourage team members to identify <i>waste</i>

ELEMENT	PERFORMANCE CRITERIA
3. Resource and encourage a proactive maintenance approach	2.4. Develop an environment where efficiency improvements are recommended by team members 3.1. Develop communications between specialists outside the team and team members 3.2. Develop strategies to monitor and deal with key reliability issues 3.3. Resource and encourage team members to identify and take appropriate action on potential equipment problems 3.4. Arrange for workforce development and training for team members as required in proactive maintenance procedures and techniques 3.5. Involve team members 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 team suggested and externally directed improvements 4.2. Facilitate team member 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 team involvement in improvement processes 4.5. Involve team and other key personnel in identification of skill needs and means of skills acquisition to fill any identified gaps

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- communication techniques

REQUIRED SKILLS AND KNOWLEDGE
• negotiation skills • information finding and analysing/using skills • team work • planning and organising • problem solving
Required knowledge:
• understanding of the competitive manufacturing process or processes used at the enterprise

Evidence 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 competent person would be able to lead a competitive manufacturing team and facilitate their improving the process.
What critical aspects of evidence is required to demonstrate competency in this unit?	Evidence of effective team leadership would be required.
In what context should assessment occur?	Assessment needs to occur in an organisation implementing a competitive manufacturing environment or by a project.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit could be assessed concurrently with other team leader units dealing with change/improvement in the organisation.
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, authentic and current evidence from a range of sources. Sources of evidence may include direct

EVIDENCE GUIDE	
	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?	Evidence from one significant manufacturing improvement or change process may be sufficient. For less significant improvement or changes, a range of changes will be needed to generate sufficient evidence.
What are the specific resource requirements for this unit?	Access to an organisation implementing a significant change to or in competitive manufacturing.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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 manufacturing	<i>Competitive manufacturing</i> is used to describe the range of systemic manufacturing practice concepts and approaches. It covers but is not limited to: • lean manufacturing • agile manufacturing • preventative and predictive maintenance approaches • monitoring and data gathering systems such as Systems control and data acquisition software (SCADA), enterprise resource planning systems (ERP), Manufacturing resource planning (MRP),

RANGE STATEMENT	
	and proprietary systems such as SAP etc. • statistical process control systems including six sigma and three sigma • just in time, kanban and other pull related manufacturing control systems • supply, value, and demand chain monitoring and analysis • other continuous improvement systems. Competitive manufacturing should be interpreted so as to take into account the stage of implementation of competitive manufacturing approaches, the enterprise's size and work organisation, culture, regulatory environment and manufacturing sector..
Team	Team may include work teams from all sections of the organisation including production, maintenance, technical, administration/finance, sales/marketing.
Budgets	Budgets include financial, time, materials/product and 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. Within manufacturing, 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.
Key reliability issues	Key reliability issues are typically things like cleanliness, lubrication and correct adjustment which are most likely to lead to failure.

Unit Sector(s)

Unit Sector	CM Change/interpersonal

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMC413A Lead team culture improvement

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills required by a team leader to help develop a culture within the team appropriate for achieving competitive manufacturing.

Application of the Unit

Application of the unit	In a typical scenario, an organisation has embarked on competitive manufacturing and a team leader is required to change / improve the team culture to be consistent with that required to maximise the benefits from competitive manufacturing and to view the team as part of the whole organisation. This unit requires the application of skills associated with communication, teamwork, problem solving, initiative, enterprise, planning, 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

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. Facilitate the team's understanding of the Competitive Manufacturing Strategy.	1.1. Communicate with all team members the objectives and benefits of the <i>competitive manufacturing strategy</i> 1.2. Review with the team members the techniques and methods that will be used in achieving the Competitive Manufacturing Strategy 1.3. Using a <i>systems approach</i>, help team members understand how the team fits into the organisation 1.4. Establish appropriate communication and team work 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 manufacturing strategy
2. Facilitate application of knowledge about the importance of controlling variation in competitive manufacturing	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 <i>variation</i> 2.2. Encourage the approach of building quality in and ensuring team members assist each other in meeting the requirement

ELEMENT	PERFORMANCE CRITERIA
3. Facilitate the development of skills and knowledge within the team 4. Facilitate the development of commitment within the team to the competitive manufacturing strategy	3.1. Encourage appropriate training for all team members 3.2. Involve team members in identification of skill needs and skills gaps, and in development of a strategy for training, skills acquisition and self-improvement so as to ensure awareness, learning and commitment 4.1. Ensure that the team has sufficient resources and adequate equipment available to meet the requirements of the competitive manufacturing 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 feed back 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 manufacturing strategy, and involve them in developing any required changes, to ensure awareness, learning and commitment

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills:
• analysis • problem solving • teamwork • planning and organising • communication • documenting

REQUIRED SKILLS AND KNOWLEDGE**Required knowledge:**

- Principles of change management
- Quality philosophy, eg Deming or Six Sigma etc

Evidence Guide**EVIDENCE GUIDE**

The Evidence Guide describes the underpinning knowledge and skills that must be demonstrated to prove competence. It is essential for assessment and must be read conjunction with the performance criteria, the range statement and the assessment guidelines of the relevant Training Package

Overview of assessment requirements	The competent person will be able to demonstrate the entwinement/integration of the elements of this unit in their application to the team.
What critical aspects of evidence is required to demonstrate competency in this unit?	Knowledge of change management principles underpinned by a quality philosophy such as Deming's Revised 14 points or Six Sigma principles, etc
In what context should assessment occur?	Assessment will need to occur in an organisation implementing/wishing to implement competitive manufacturing.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit could be assessed concurrently with other relevant units.
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, 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

EVIDENCE GUIDE	
	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?	Evidence of consistent application of the principles and moving down the path should be sufficient evidence rather than evidence of having arrived.
What are the specific resource requirements for this unit?	Access to an organisation implementing competitive manufacturing.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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 Manufacturing Strategy	Strategies may include one or more of: • Six sigma • Lean Manufacturing • Agile Manufacturing • Just in Time • Supply chain management • Value Chain Management • Total Quality • Pro Active maintenance • Elimination of waste • Balanced Scorecard
Variation	Variation is used to mean variation from quality standards and customer requirements as expressed in production schedules and technical specifications.

RANGE STATEMENT	
Systems approach	A systems approach enables persons to see how work gets done and effect of changes and shows the internal / external relationships through which products and services are produced and may include considerations of the role and requirements of: • customers • suppliers • employees • other value chain members • members of the public and community groups • other external individual, group or organisation. • technical processes and equipment • statutory and regulatory requirements including OHS and environment legislation and regulations • quality standards
Work structures	Teams may be self directed, cross functional etc. Structures are appropriate to the job and job steps are in a logical order

Unit Sector(s)

Unit Sector	CM Change/interpersonal

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMC610A Manage relationships with non-customer external organisations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit is focused on the skills needed 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

Application of the unit	In a typical scenario, the person (who may be a section leader, production manager or similar) will be expected to deal with a range of external organisations. Some of these will be relationships initiated by the manager's organisation, others will not. Regardless they need to be managed to the maximum benefit of the organisation and the organisation's 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 required to effectively manage organisational relationships. 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

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 mutual interest	1.1. Clarify the <i>reason contact</i> was/is to be made 1.2. Identify expectations of initiating organisation 1.3. Discuss expectations, ability to meet those expectations and areas of mutual interest
2. Determine contribution of relationship	2.1. Identify any value contributions from relationship 2.2. Identify <i>waste</i> arising from relationship 2.3. Classify waste as necessary or unnecessary
3. Manage the relationship. in order to enhance the enterprise reputation, efficiency and profitability	3.1. Measure performance of relationship against expectations 3.2. Develop systems to enhance mutual benefit and value contributions from relationship 3.3. Develop systems to minimise and control <i>necessary waste</i> without causing harm 3.4. Eliminate <i>unnecessary waste</i> where possible without causing harm

ELEMENT	PERFORMANCE CRITERIA
	3.5. Manage or terminate the relationship in a manner which enhances the organisation

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication
- negotiation
- planning

Required knowledge

- 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

Evidence 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 requirements	The person will deal with a range of non-customer external organisations. Relationships will be managed so as to be of benefit.
What are the specific resource requirements for this unit?	Access to an organisation using competitive manufacturing.
What critical aspects of evidence are required to demonstrate competency	Evidence of relationships with external, non-customer organisations and their management.

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in this unit?	
In what context should assessment occur?	Assessment will occur in an organisation following competitive manufacturing or by a suitable case study.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	
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, 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?	There should be evidence from a number of relationships managed over an extended period.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. 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

RANGE STATEMENT

operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Reason contact

Contacts may be made for the purpose of research, innovation, mutual cooperation, strategic alliances, computer (or other) technology, emergency response etc.

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
- 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 (for example 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 Change/interpersonal

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMC611A Manage people relationships

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed to manage the human relationship aspects of implementing and operating competitive manufacturing systems.

Application of the Unit

Application of the unit	In a typical scenario, a person (who may be a manager, technical specialist or other person) is required to work with people, encourage them to accept change and also to increase the quality, quantity and reliability of output. Much of this is due to good relations with the employees and relevant people. This unit primarily requires on strong communication, teamwork, and problem solving skills to achieve effective relationships that support a competitive manufacturing environment. Initiative and enterprise and planning and organising are also required to ensure relationships are monitored and issues are resolved proactively. This also requires aspects of self management and learning to ensure improvement of own performance and communication skills.

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 an open environment	1.1. Establish and maintain regular dialogue between all levels and all relevant sections of the organisation 1.2. Encourage a flow of communications in both directions 1.3. Identify key personnel for communications 1.4. Develop and maintain a formal mechanism for the flow of issues, concerns and suggestions in both directions 1.5. Develop and maintain regular and frequent verbal communication with all key stakeholders
2. Identify significant issues	2.1. In liaison with relevant team members/ stakeholders , identify current and potential issues 2.2. Assist team members/stakeholders to formulate issues 2.3. Identify and define boundary and 'non-negotiable' issues for all team members/stakeholders 2.4. Negotiate with relevant team members/stakeholders over actual and potential

ELEMENT	PERFORMANCE CRITERIA
	issues
3. Proactively resolve issues	3.1. Liaise with team members/stakeholders to develop agreed, and where possible win-win, solutions 3.2. Negotiate acceptable solutions as required in accordance with company practices/procedures 3.3. Obtain any required official authorisations 3.4. Consult with relevant stakeholders to develop implementation plan 3.5. Implement solution
4. Monitor ongoing situation	4.1. Determine relevant Key Performance Indicators (KPIs) for plan 4.2. Check that implementation is proceeding to plan 4.3. Check for unforeseen consequences 4.4. Take appropriate action to resolve any arising issues

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- negotiating
- communication
- teamwork
- problem solving

Required knowledge

- knowledge of industrial relations structures
- relevant awards and agreements
- types of workforce structures and reward systems

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 this Training Package.

Overview of assessment requirements	The person will be able to develop a relationship with the team members which will make a positive contribution to the organisation.
What are the specific resource requirements for this unit?	Access to a workplace implementing competitive manufacturing strategies is required. No other specific resources are required.
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of managing people relationships and dealing with issues.
In what context should assessment occur?	Assessment will need to occur in a competitive manufacturing organisation and where the individual is responsible for managing people relationships or by case study.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be assessed concurrently with appropriate units.
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, 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.

EVIDENCE GUIDE

What evidence is required for demonstration of consistent performance?

Evidence should be available from an extended period of time and may be historic if the person has been in this role for some time.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. 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 manufacturing

Competitive manufacturing is used to describe the range of systemic manufacturing practice concepts and approaches. It covers but is not limited to:

- lean manufacturing
- agile manufacturing
- preventative and predictive maintenance approaches
- monitoring and data gathering systems such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Manufacturing Resource Planning (MRP), and proprietary systems such as SAP
- statistical process control systems, including six sigma and three sigma
- Just in Time (JIT), kanban and other pull related manufacturing control systems
- supply, value, and demand chain monitoring and analysis
- other continuous improvement systems.

Competitive manufacturing should be interpreted so as to take into account the stage of implementation of competitive manufacturing approaches, the enterprise's size and work organisation, culture, regulatory environment and manufacturing sector.

Key personnel

Key personnel for communication include formally identified managers, supervisors and workforce

RANGE STATEMENT	
	delegates as well as key opinion shapers (such as employees with specialist technical knowledge) on the issue being communicated.
Formal mechanisms	Formal mechanisms for communication will vary according to the enterprise but may include notice boards, employee circulars, consultative committees, staff associations, union representatives, team leaders.
Stakeholders	Stakeholders include team members, personnel officers, industrial officers, union delegates, production management, human relations management, financial management, engineering/technical personnel.

Unit Sector(s)

Unit Sector	CM Change/interpersonal

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMC612A Manage workplace learning

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills required to manage the learning and skill development for a manufacturing workforce.

Application of the Unit

Application of the unit	Management of the identification of skills needed by a work force to undertake the required work 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 enterprise. Planning and organising is required to ensure skill development meets the needs of the enterprise and aspects of self management and learning are required to ensure improvement of performance.

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 current skill requirements for the work team	1.1.Ensure records/data base of skill mix currently required by the work team are maintained in accordance with <i>procedures</i> 1.2.Re-assess and monitor the skills required by the team as enterprise requirements change 1.3.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 work team	2.1.Ensure current records/data base of skill profile of individuals within the team 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 the team compared to the required skill mix of the team
3. Make arrangements for skill development	3.1.Consult with team 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

ELEMENT	PERFORMANCE CRITERIA
	3.4. Develop individual skill development program 3.5. Ensure skill development programs 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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication
- planning
- assessing
- analysing
- negotiation
- problem solving
- teamwork

Required knowledge

- knowledge of skill analysis methods or how to access skill analysis from relevant experts
- knowledge of skill development methods, or how to access skill development programs from relevant experts
- relevant formal qualifications/skill standards available to the team members, and their relevance to the job and 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 this Training Package.

Overview of assessment requirements	The person will ensure that at all times the team has all the skills required to complete their work, but not necessarily any more skills.
What are the specific resource requirements for this unit?	Access to a workplace implementing competitive manufacturing strategies is required. No other specific resources are required.
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of the work team always having the required skills for the job.
In what context should assessment occur?	Assessment will need to occur in a competitive manufacturing organisation or by case study.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be assessed concurrently with appropriate units.
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, 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.

EVIDENCE GUIDE

What evidence is required for demonstration of consistent performance?

Evidence should be available from an extended period of time and may be historic if the person has been in this role for some time.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. 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.

Workplace learning

This unit covers the development and maintenance of skill of the team operating in a Just in Time (JIT) environment. It covers both formally recognised and unrecognised training as well as other skill development programs. It may include job rotation, internal training, external training and self directed training.

Procedures

Procedures include 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 Good Manufacturing Practice (GMP), Responsible Care) and government regulations.

Procedures may also include industrial relations requirements and any classification changes that result from the acquisition of higher level skills.

Unit Sector(s)

Unit Sector	CM Change/interpersonal

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMG700A Review continuous improvement processes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the local level review and further development of an existing continuous improvement process.

Application of the Unit

Application of the unit	This unit is intended for team leaders and people with a similar sphere of influence/scope of authority and responsibility. It applies to individuals who are already familiar with change leadership in a competitive manufacturing environment through either previous study or industry experience. Where this is not the case MSACMC410A Lead change in a manufacturing environment may be completed to supply the necessary skills. Skills covered by this unit apply to the review of existing continuous improvement processes in a team, area or department environment, or in the case of a small or medium sized manufacturer, to the whole enterprise. This unit may also be applied to service organisations applying competitive manufacturing principles.

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 continuous improvement practice	1.1. Review performance against current key performance indicators (KPIs) 1.2. Review KPIs for ongoing relevance 1.3. Review current state of continuous improvement processes 1.4. Audit health, safety and environment (HSE) changes as a result of continuous improvement activity 1.5. Analyse problems to determine root cause/s 1.6. Identify areas for improvement to KPIs and continuous improvement processes
2. Develop plan for enhancing improvement	2.1. Prioritise areas requiring action 2.2. Develop a range of possible solutions including taking into account the impact of the solution on any

ELEMENT	PERFORMANCE CRITERIA
processes	codes of practice, standards, contracts, commercial or industrial agreements 2.3. Discuss possible solutions and implications with stakeholders 2.4. Compare outcomes from possible solutions to competitive philosophy 2.5. Choose actions which are most compatible with competitive philosophy 2.6. Draft implementation plan for chosen action 2.7. Obtain required approvals and modify plan as required
3. Implement enhanced improvement process	3.1. Communicate changes to improvement processes to team members 3.2. Resolve issues and problems identified by team members 3.3. Obtain sign off from process/system owner 3.4. Arrange for skills development as necessary 3.5. Arrange for required resources to be available 3.6. Establish and implement KPIs for modified continuous improvement process 3.7. Implement planned changes 3.8. Check the planned improvements have occurred 3.9. Take action to sustain improvement by standardising

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- problem solving and decision making
- communication across all levels in an organisation
- the ability to analyse current state/situation
- the ability to analyse workplace strategy and vision statements and principles and to link these to current processes, performance and indicators

Required knowledge

- competitive manufacturing principles

REQUIRED SKILLS AND KNOWLEDGE

- competitive manufacturing tools, their applications and limitations
- methods of determining competency gaps
- continuous improvement processes
- types of KPIs and their impacts on performance
- relationship between maintenance and continuous improvement

Evidence 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**

Demonstrates skills and knowledge required to:

- critically review continuous improvement processes.

In particular look for evidence of:

- ongoing review of processes
- development of improvement plans
- implementation of improvement plans.

Context of and specific resources for assessment

Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.

Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Method of assessment

- Assessment must satisfy the endorsed assessment guidelines of the Manufacturing Training Package.
- Assessment methods must confirm consistency and accuracy of performance (over time and in a range of

EVIDENCE GUIDE	
	workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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
Health, safety and environment (HSE)	All changes implemented should be at least neutral, or preferably beneficial, in their impact on health, safety and environment
Organisation	Organisation includes: • any part of a manufacturing or service organisation • companies, government bodies or other body

RANGE STATEMENT	
	of people aiming to produce a product to service a customer
Relevance	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
Compare outcomes	Outcomes include comparing: • cost/benefit • timing • value chain implications • HSE issues • process reliability issues • benefit to customer/perceived customer value
Competitive philosophy	Competitive philosophy includes that body of knowledge and techniques which together guides an organisation towards achieving best practice in their processes and includes knowledge and techniques listed under various titles such as: • manufacturing practice • lean manufacturing • agile manufacturing
Required resources	Required resources include: • plant • materials (raw materials, components, work in progress, other consumables) • energy (heating, cooling, fuel) • people • skills • finances • feedback/visual factory resources • measuring equipment
Sustaining improvement	Improvement may be sustained by including it in:

RANGE STATEMENT	
	• standard procedures and work instructions • standard practice • other relevant documents and practices
Team leader	Team leader may include: • any person who may have either a permanent or an <i>ad hoc</i> role in facilitating the function of a team in a workplace

Unit Sector(s)

Unit sector	CM Graduate

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MSACMG702A Review manufacturing practice tools and techniques

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the application of continuous improvement to the use of competitive manufacturing tools and techniques; that is, facilitating the right use of the right tool at the right time and reviewing its application.

Application of the Unit

Application of the unit	This unit is intended for team leaders and people with a similar sphere of influence and scope of authority and responsibility. It covers the reviewing of competitive tools used by an organisation which has already embarked on a competitive manufacturing path and is driven by the pull of its customers. The unit includes checking that the relevant competitive manufacturing practice tools are being consistently and correctly applied across the entire organisation to enhance customer and organisation value. It also includes reviewing the processes used to identify when additional or different competitive manufacturing tools should be applied. This unit applies to individuals who have a broad knowledge of all major competitive tools with in-depth application knowledge of several tools which are relevant to the organisation and familiarity with a define, measure, analyse, improve, control (DMAIC) approach. This unit may also be applied to service organisations applying competitive manufacturing principles.

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 the use of competitive manufacturing tools	1.1. Identify which competitive tools are being used in the work area 1.2. Define the outcomes expected from each tool 1.3. Observe and measure the actual outcomes being achieved 1.4. Identify gaps between actual outcomes and planned outcomes

ELEMENT	PERFORMANCE CRITERIA
	1.5. Determine if the tools are being used as intended 1.6. Review tool use and determine if the most appropriate tool is being used 1.7. Audit health, safety and environment (HSE) impacts from the use of tools 1.8. Identify any system/process issues impeding the tools delivering their expected outcomes 1.9. Identify any gaps between tool capability and customer benefit requirements
2. Recommend changes to the use of competitive manufacturing tools	2.1. Define required further improvements identified 2.2. Prioritise required further improvements 2.3. Identify gaps inhibiting tool use 2.4. Recommend system and process changes as required to improve tool use 2.5. Recommend alternative or additional tools as required to achieve organisation requirements 2.6. Obtain required authorisations for changes
3. Facilitate the better use of competitive manufacturing tools	3.1. Facilitate training or other resources needed as required to improve tool use 3.2. Facilitate system and process changes as required to improve tool use 3.3. Facilitate the introduction and use of new tools as required 3.4. Initiate procedures for sustaining the changes

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- decision making
- communication at all levels
- situation analysis
- analysis

Required knowledge

- competitive manufacturing principles

REQUIRED SKILLS AND KNOWLEDGE

- competitive manufacturing tools, their applications and limitations
- customer benefit
- ways of determining competency gaps
- DMAIC process applied to competitive manufacturing tool use
- approvals and delegations within the organisation
- procedures including processes for updating and drafting of 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**Critical aspects for assessment and evidence required to demonstrate competency in this unit**

Demonstrates skills and knowledge required to:

- critically review the use of competitive tools.

In particular look for evidence of:

- taking a DMAIC approach
- comparing actual outcomes to planned outcomes
- discriminating between the causes of suboptimal performance
- recommending appropriate changes to tools used, tool usage and/or tool implementation.

Context of and specific resources for assessment

Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.

Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

EVIDENCE GUIDE	
Method of assessment	• Assessment must satisfy the endorsed assessment guidelines of the Manufacturing Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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.	
Review tool use	Review of tool use includes: • identifying whether a better tool could have been used and whether there is an appropriate balance between daily continuous improvement and kaizen blitz
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards,

RANGE STATEMENT	
	the latest version must be used
Health, safety and environment (HSE)	All changes implemented are expected to be at least neutral, or preferably beneficial, in their impact on health, safety and environment
Outcomes	Outcomes include: the benefits both to the organisation and also the customers
Define improvements	The definition of improvements may include: - a specification of the problem/capability gap being addressed - a specification of how that problem/gap will be solved/filled - a statement of the intended benefits of the solution - a statement of the indicators of progress and success
Organisation	Organisation includes: - any part of a manufacturing or service organisation - companies, government bodies or other body of people aiming to produce a product to service a customer
Competitive tools	Competitive tools are those techniques used to improve competitive manufacturing, typically described in the competitive manufacturing 'tools units' including: 5S - Just in Time (JIT)/kanban - quick changeover - root cause analysis - maintenance including failure mode effects analysis (FMEA), and mean time between failure (MTBF)
Team leader	Team leader may include: any person who may have either a permanent or an ad hoc role in facilitating the function of a team in a workplace

RANGE STATEMENT	
Gaps inhibiting tool use	Gaps inhibiting tool use may include: • competency gap of employees in own or other value chain enterprise • lack of management or employee support • lack of financial or other resources • inadequate data
Sustaining improvement	Improvement may be sustained by including it in: • standard procedures and work instructions • standard practice • other relevant documents and practices

Unit Sector(s)

Unit sector	CM Graduate

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MSACMG707A Respond to a major non-conformance

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the skills and knowledge required to lead a response at a team or area level to a major non-conformance which could have severe business impacts. The unit can be applied to sub-sections of an enterprise such as a team, area or department, or in the case of a small or medium sized manufacturer, to the whole enterprise.

Application of the Unit

Application of the unit	This unit applies to team leaders and people with a similar sphere of influence and scope of authority and responsibility and covers the skills required to respond to a situation where people, processes, equipment or systems fail to meet requirements (there is a major non-conformance) for whatever reason, and this will have significant business consequences. The non-conformance may be anywhere in the value chain, not necessarily in the team, department or area which needs to respond. Many teams, departments or areas may need to respond. However, this unit applies to the skills needed to lead a single team, department or area response. This unit is not primarily about identification of the cause of the non-conformance but rather about skills for appropriate responses to contain the situation, including not allowing it to accelerate or cascade. It is also about skills to minimise the adverse consequences while doing what can be done at the team, department or area level to remedy the situation. This unit does not cover the specialist skills required to

	contain/remediate an emergency non-conformance such as a fire or explosion. Relevant emergency management skills from other Training Packages should be accessed for these skills. This unit may be also applied to service organisations applying competitive manufacturing principles.

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. Define extent and nature of non-conformance	1.1. Identify target performance prior to non-conformance 1.2. Determine commencement and expected duration of non-conformance 1.3. Determine impact of non-conformance on target performance 1.4. Determine impact of non-conformance with health, safety and environment (HSE) performance 1.5. Determine impact of non-conformance on maintenance performance 1.6. Liaise with customers to determine minimum acceptable performance during period of non-conformance 1.7. Define non-conformance in terms of customer requirements and target performance
2. Determine priorities and actions	2.1. Develop possible responses appropriate to the situation 2.2. Determine possible timing of possible responses 2.3. Identify required resources for the responses developed 2.4. Evaluate possible responses and select or shortlist responses 2.5. Select responses and obtain necessary approvals 2.6. Organise resources as appropriate
3. Identify information needs	3.1. Determine the information needs of stakeholders 3.2. Identify the sources of required information 3.3. Arrange to collect required information 3.4. Obtain authorisation to disseminate information 3.5. Report information to stakeholders as appropriate
4. Implement response	4.1. Initiate response and establish data and information collection procedures 4.2. Analyse data and other information as it comes to hand 4.3. Determine progress of response to achieving required outcomes 4.4. Modify response including deployment of resources as required to better achieve desired outcomes
5. Establish plan to return to normal conformance	5.1. mine root cause of non-conformance 5.2. Develop remedial plan to eliminate root cause 5.3. Obtain sign off from process/system owner for

ELEMENT	PERFORMANCE CRITERIA
	planned action 5.4. Implement remedial plan and establish normal conformance
6. Conclude and review response	6.1. Conduct a debrief and complete reports as required 6.2. Evaluate and review response and procedures 6.3. Evaluate and document effectiveness of the response function and its interaction/communication with stakeholders 6.4. Recommend improvements to prevent a recurrence and improve response for other non-conformances 6.5. Communicate reports in accordance with company procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- decision making
- communication at all levels
- prioritisation
- negotiation
- problem solving including root cause analysis
- situation analysis
- speed

Required knowledge

- the importance of standardisation in production processes
- customer needs as distinct from wants
- communication methods
- sources of additional resources

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, 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

Demonstrates skills and knowledge required to:

- recognise and deal effectively with a major non-conformance.

In particular look for evidence of:

- defining the impact of the non-conformance
- developing and prioritising appropriate responses to contain the impacts of the non-conformance
- implementation, monitoring and modifying responses.

Context of and specific resources for assessment

Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.

Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Method of assessment

- Assessment must satisfy the endorsed assessment guidelines of the Manufacturing Training Package.
- Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of underpinning knowledge.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that

EVIDENCE GUIDE	
	competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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
Major non-conformance	A major non-conformance may be: - a failure to receive a delivery - receiving a delivery which is out of specification - a failure of the transport system to make deliveries to customers or from suppliers - a problem in the process which fails to produce product or only produces non-conforming product - a major incident such as a fire or loss of containment - a breakdown of critical plant/equipment - a commercial or legal problem which affects the ability to produce to requirements - excessive absences of key personnel due illness, or transport breakdown - a security situation preventing key personnel

RANGE STATEMENT	
	from performing their duties and/or deliveries being made • a major supply shortage or price increase
Business impacts	Business impacts may include: • sudden increase in defect rates • loss of supply of materials or components • loss or severe restriction of process capability • loss of transport from process • increases in fuel energy costs • increases in the cost of finance/capital.
Performance	Performance includes: • the production volume, quality, cost, HSE and similar measures as appropriate at the team level
Response	Response includes all those strategies which will minimise the impact of the non-conformance on the customer and must be consistent with: • the philosophies and strategies of the organisation • HSE requirements • delivery, statutory and contractual requirements Response may include: • supply from another source • production from other areas • agreements for reduced supply • agreements to accept different quality Response duration may include: • short term response to cover immediate situation • different long and medium term response • transition strategies where there are different strategies at different phases of the response
Timing of responses	Timing of response may be controlled by the nature of the non-conformance and may include: • implementation following initial containment/stabilisation of situation (e.g. where the non-conformance is a major incident such as a

RANGE STATEMENT	
	fire or loss of containment) • immediate initiation but delayed implementation (e.g. where the non-conformance is a breakdown of critical plant/equipment which will require repair/replacement before implementation) • immediate implementation (e.g. when the non-conformance does not prevent the response from starting or there is an alternative which bypasses the non-conformance)
Health, safety and environment (HSE)	All changes implemented are expected to be at least neutral, or preferably beneficial, in their impact on health, safety and environment
Stakeholders	Stakeholders include: • work team members, value chain members as well as other stakeholders and may be internal and external to the team and possibly the organisation
Team leader	Team leader may include: • any person who may have either a permanent or an ad hoc role in facilitating the function of a team in a workplace

Unit Sector(s)

Unit sector	CM Graduate

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MSACMG712A Lead a problem solving process to determine and solve root cause

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers guiding or leading a problem solving process to solve complex and/or unusual problems. The problem solving process will usually involve the use of either real or nominal groups to determine the root cause and propose the solution.

Application of the Unit

Application of the unit	This unit will typically be undertaken by managers and/or technical experts. In a typical scenario, a manager or technical expert will be confronted by a complex problem to which they need to develop a solution. The problem may be related to any area or process within the enterprise or in the value chain. The person may or may not have the required technical expertise for the particular problem, although the problem will require technical expertise to be solved. The problem may be capable of being adequately defined at the beginning of the problem solving activity, or may be progressively defined through continued iterations of the problem solving activity.

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. Recognise complex problem	1.1. Identify a complex issue which needs to be addressed 1.2. Undertake an initial investigation of the issue 1.3. Determine initial areas of expertise and data which may be required to analyse the problem 1.4. Develop an initial definition of the problem
2. Develop problem solving methodology	2.1. Draft a problem solving methodology 2.2. Develop required approaches and protocols for obtaining required data and information 2.3. Establish group to assist with problem solving 2.4. Allocate tasks, responsibilities and reporting arrangements to group 2.5. Develop arrangements for consultation with required people outside of group

ELEMENT	PERFORMANCE CRITERIA
3. Analyse problem	3.1. Apply methodology 3.2. Obtain data/information 3.3. Review problem definition 3.4. Review methodology 3.5. Obtain additional data/information as required
4. Identify root cause	4.1. Map causal links for the problem 4.2. Determine indicators of the problem or the problem precursors 4.3. Identify causes which can be controlled/brought under control
5. Develop a solution	5.1. Develop solutions for controllable causes 5.2. Determine benefit/cost for proposed solutions 5.3. Investigate proposed solutions for efficacy 5.4. Select the best available solution 5.5. Obtain necessary support and authorisations for proposed solution 5.6. Initiate the implementation of the solution
6. Check problem is solved and standardised	6.1. Monitor indicators of problem/problem precursor 6.2. Review problem solution/implementation as required 6.3. Ensure appropriate solution is standardised

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- ability to cooperate and work with others, both internally and externally to the work group
- analysis and planning
- data interpretation and application skills
- communication skills (both receiving and sending communications)
- problem solving and prioritising

Required knowledge

- understanding of the techniques and methodologies of problem solving

REQUIRED SKILLS AND KNOWLEDGE

- data required for problem solving
- alternative/proxy data sources
- benefit/cost analysis
- root cause analysis
- problem solving tools 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, 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**

Demonstrates skills and knowledge required to:

- undertake complex problem identification
- establish appropriate methodologies, including establishing team responsibilities, to achieve root cause identification
- propose and implement solutions that can be standardised.

Context of and specific resources for assessment

Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.

Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Method of assessment

- Assessment must satisfy the endorsed assessment guidelines of the Manufacturing Training Package.
- Assessment methods must confirm consistency and accuracy of performance (over time and in a range of

EVIDENCE GUIDE	
	workplace relevant contexts) together with application of underpinning knowledge. • Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application. • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Complex problem	A complex problem may be described as one which has several of the following characteristics: • requires going into the value chain for data/information • is wider than just applying to a single job • applies to less common solutions or problems • requires a higher level of knowledge and skill (which may or may not be possessed directly by the person solving the problem) such as: • significant specialist knowledge • significant specialist skill

RANGE STATEMENT	
	• more theory/understanding of technology or process • data is not easily available and may need particular strategies to obtain such as: • overcoming resistance from people including employees, customers or suppliers • extracting data not regularly reported from systems control and data acquisition (SCADA) or similar systems • the problem and/or proposed solutions require reporting or authorisations from a Board or external authorities such as licensing or regulatory bodies
Problem recognition	The problem recognition may include: • an obvious and current complex problem • an intractable problem which has been known about and 'lived with' for some time • a complex problem which has not been previously recognised The problem may, or may not be capable of complete definition at the start of the problem solving process (so requiring an iterative process)
Problem solving methodology	Problem solving methodology may include: • cross functional problem solving team • cross functional nominal group (virtual team) • members from outside the organisation on some basis • input from other members of the value chain • the use of known/proprietary problem solving approaches or some synthesis of methods • commissioned research either in whole or in part
Group	Problem will be such that it is beyond the scope of an individual to solve and so a group is required. The group may be: • real (i.e. physical, face-to-face) • nominal (i.e. never meets and may not know who each other is) • or any combination in between

RANGE STATEMENT	
Solution efficacy	Checking solution efficacy includes: • ensuring the solution breaks the causal tree • checking that other causes are not able to cause the problem • benefit/cost ratio • ease of implementation • permanence of solution
Solution standardisation	Standardisation of a solution solves the problem and should include all relevant standards within the organisation including: • standard operating procedures/work instructions • actual work practice • maintenance manuals and similar • product and/or process specifications

Unit Sector(s)

Unit sector	CM Graduate

Competency field

Competency field	

Co-requisite units

Co-requisite units		

MSACMS401A Ensure process improvements are sustained

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed to ensure that the gains which have been made by using improved methods, processes and equipment are sustained as the new base line/standard to the team's area of work and so prevent regression to former practices, or digression to less efficient practices.

Application of the Unit

Application of the unit	This unit applies to an environment where continuous improvement in a manufacturing enterprise is being undertaken. The team leader or other responsible person then facilitates and implements methods of ensuring that these improvements are sustained. 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. The unit covers ensuring that team members implement the modified processes to ensure the improvements are sustained and opportunities taken to suggest further improvements. This unit requires the application of skills associated with problem solving, initiative and enterprise, planning and organising in order to check and monitor the impacts of change. It also requires communication and teamwork in order to assess the impact of change in a team's area of work. Self management and learning will be used to continuously monitor change influences and adapt improvements according to new information and

	feedback.

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. Ensure corrective actions are implemented.	1.1.Liaise with relevant people associated with the anticipated corrective action 1.2.Ensure the supply of resources (equipment, modifications, consumables, people) 1.3.Check occupational health and safety (OHS) impacts of corrective action and take action in accordance with procedures if required 1.4.Ensure workforce has relevant skill level 1.5.Negotiate solutions with relevant people to allow

ELEMENT	PERFORMANCE CRITERIA
	implementation 1.6. Supervise implementation of corrective action 1.7. Monitor implementation of corrective action 1.8. Make required adjustments
2. Verify systems support improvement	2.1. Ensure procedures reflect improvements 2.2. Ensure training and assessment systems reflect improvements 2.3. Liaise with relevant people to ensure their support of the new modified system/s
3. Audit the change	3.1. Determine an appropriate audit period/cycle 3.2. Agree relevant measures/indicators for the improvement 3.3. Measure performance at agreed times using agreed measures 3.4. Investigate the cause/s of under performance 3.5. Take appropriate corrective action to improve performance 3.6. Reaudit the improvement on an agreed basis

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- communication/negotiation skills
- teamwork
- basic mathematics
- planning
- problem solving
- analysing.

Required knowledge:

- existing procedures
- modified procedures
- overall process of manufacturing relative to improvements being made
- appropriate measures of performance
- business performance goals sufficient to determine best measures of improved

REQUIRED SKILLS AND KNOWLEDGE

performance.

Evidence 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 point to improvements which have been made where they have been active in designing and implementing systems for sustaining the improvement.

What critical aspects of evidence are required to demonstrate competency in this unit?

Evidence of having sustained improvements in the workplace and of reviewing these improvements for their real impact.

In what context should assessment occur?

Assessment will need to occur in a workplace where improvements are occurring, or where specific improvement projects are undertaken for the purpose of providing evidence of competence (among other aims).

The unit may also be assessed on a project basis in a simulated environment.

Are there any other units which could or should be assessed with this unit or which relate directly to this unit?

This unit may be assessed concurrently with appropriate units on continuous improvement.

This unit relates to a team leader ensuring that their team sustains improvements. *MSACMS201A Sustain process improvements* is a lower level unit for a person's own area of responsibility.

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, authentic and current evidence from a range of sources. Sources of evidence may include direct observation, reports from supervisors, peers and

EVIDENCE GUIDE	
	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?	Evidence should be available from multiple small changes, or from a large change which has had multiple facets implemented over a period of some months.
What are the specific resource requirements for this unit?	Access to a workplace implementing competitive manufacturing strategies, or where improvement projects can be conducted and relevant records is required. No other specific resources are 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. Essential operating conditions that may be 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.	
Systems	Systems is used to mean any/all of the equipment, process, procedures and work practices that are used to produce the product. A term often used in this context is: • 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.

RANGE STATEMENT	
Procedures	Procedures include 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 (e.g. Good Manufacturing Practice (GMP), Responsible Care) and government regulations.
Improvement	Improvement procedures in some enterprises are also known by baka-yoke which is a manufacturing technique of preventing mistakes by designing the manufacturing process, equipment and tools so that an operation literally cannot be performed incorrectly. An attempt to perform incorrectly, as well as being prevented, is usually met with a warning signal of some sort. The term poka-yoke is sometimes referred to as a system where only a warning is provided. Improvements may be sustained by use of technology so that it is impossible to do the job any other way. However, improvements may also be sustained by changes to process or procedures or other changes to the manufacturing system which, if followed, will sustain the change and this unit may be applied to all these situations.
Measuring performance	Measuring performance is not used literally and may mean the personal taking of measurements, or it may mean arranging for measurements to be taken/made by appropriate personnel. The interpretation of the measurements however is to be undertaken personally.

Unit Sector(s)

Unit Sector	CM Systems

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMT230A Apply cost factors to work practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed for an individual to identify cost components and to be able to determine in general terms the cost impacts of alternative actions.

Application of the Unit

Application of the unit	In a typical scenario, a person 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 person is 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

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 in own work area major cost components of product or process	1.1. Identify <i>cost components</i> in the product or <i>process</i> 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 the control of the individual or team 2.3. Relate identified costs factors to impact on <i>overall cost</i> 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. Express 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

ELEMENT	PERFORMANCE CRITERIA
	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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- basic numeracy
- problem solving
- communication

Required knowledge

- cost components of products made
- costs concepts such as expense and income
- major cost contributors to product (eg energy)
- the difference between internally and externally controlled costs
- difference between overhead, labour and consumables

Evidence 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 as part of their routine decision making aim to minimise costs. There should be evidence of their doing so.
What are the specific resource requirements for this unit?	Access to a workplace implementing competitive manufacturing strategies. No other specific resources are required.
What critical aspects of evidence are required to demonstrate competency	Evidence of being able to identify costs factors

EVIDENCE GUIDE	
in this unit?	relevant to an individual's job. Evidence of having made appropriate decisions to minimise overall costs.
In what context should assessment occur?	Assessment will need to occur in a workplace or by use of a work based case study.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be assessed concurrently with appropriate units on continuous improvement.
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, 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?	Evidence should be available over a period of time or from more than one process or product.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold

RANGE STATEMENT

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.

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 and government taxes and charges.
Process	Process may include a production, maintenance, logistics or office process in a manufacturing environment.
Overall cost	Overall cost may include the assessment of negative and positive financial implications. It also includes negative long term issues, such as Occupational Health and Safety (OHS), environmental and regulatory issues.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT231A Interpret product costs in terms of customer requirements

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed for a person to be able to identify the major cost components of their product/s, the basic relationship of these to customer benefits and use this to help minimise waste (defined as anything not delivering a customer benefit). It has a different focus to <i>MSACMT230A Apply cost factors to work practices</i> which focuses on costs in isolation whereas this unit regards all costs not directly leading to customer benefit as waste. It may apply to all employees.

Application of the Unit

Application of the unit	In a typical scenario, an employee uses their understanding of the customer's requirements of the product or process being undertaken as the basis for investigating processes to identify waste sources and then take actions relevant to their level of competency and authority to reduce this waste. It requires and 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

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 cost components deriving from customer benefits and other costs	1.1. Identify <i>customer features/benefits</i> in product or process being undertaken 1.2. Identify cost components which deliver customer features/benefits and those which don't 1.3.
2. Compare required performance of product or process steps with actual performance	2.1. Identify <i>performance</i> 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 <i>customer-related targets</i> 2.4. Separate costs components into those that

ELEMENT	PERFORMANCE CRITERIA
	contribute to customer features/benefits and those that do not contribute 2.5. Determine <i>non-contributing cost components</i> 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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- numeracy
- analysis
- communication and literacy

Required knowledge

- 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 (eg energy)
- the difference between internally and externally controlled costs
- difference between overhead, labour and consumables

Evidence 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.

EVIDENCE GUIDE	
Overview of assessment requirements	An employee will as part of their everyday routine aim to minimise waste and establish a focus in their work on meeting targets that contribute to customer features/benefits.
What are the specific resource requirements for this unit?	Access to a workplace implementing competitive manufacturing strategies. No other specific resources are required.
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of being able to identify cost factors in employees work in terms of customer features/benefits and having made appropriate recommendations to reduce waste. Evidence of implementing changes which reduce waste.
In what context should assessment occur?	Assessment will need to occur in a workplace or through a project in a simulated work environment.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be assessed concurrently with appropriate units on continuous improvement.
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, 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?	Evidence should be available from several episodes of analysis and implementation of recommendations to reduce waste and improve customer features/benefits.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. 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.

Customer features/benefits	Customer features/benefits are those 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 be thought of as the rate of output of the plant compared to the rate required to meet demand. Performance might also be thought of in terms of 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 are the internally set financial and operational targets that contribute to meeting customer features/benefits.
Non-contributing cost components	Some costs incurred 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. Other costs do not contribute to customer features/benefits (non-contributing cost components) and either must be maintained such as regulatory compliance and occupational health and safety (OHS) costs while other costs 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) is any activity which does not contribute to customer benefit/features in the product.

RANGE STATEMENT	
	Within manufacturing, 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	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT240A Apply 5S procedures in a manufacturing environment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed for an employee to apply 5S procedures (a structured approach to housekeeping) to their own job and work area.

Application of the Unit

Application of the unit	In a typical scenario, an organisation has decided to embark on a competitive manufacturing strategy and as part of this has adopted the philosophy of 5S as one of the tools to move down this path. 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

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. Sort needed from un-needed	1.1. Identify all <i>items</i> in the work area 1.2. Distinguish between essential and non-essential items 1.3. Place any non-essential item in a appropriate place, not in the work area 1.4. 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 <i>procedures</i> 4.2. Follow checklists for activities where available 4.3. Keep the work area to specified standard

ELEMENT	PERFORMANCE CRITERIA
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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication
- planning
- organising
- prioritising
- reading and interpretation
- recording
- problem solving

Required knowledge

- meaning and application of 5S to their job
- principles of efficient workplace organisation
- purposes of 5S
- procedures relevant to job
- methods of making/recommending improvements

Evidence 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

EVIDENCE GUIDE

guidelines for this training package.

Overview of assessment requirements	There should be evidence that the employee is routinely applying 5S principles in their routine work and that they are aware of why 5S is important.
What are the specific resource requirements for this unit?	Access to a plant implementing/practising 5S. No other specific resources re required.
What critical aspects of evidence is required to demonstrate competency in this unit?	Evidence of routine practice of 5S as part of their job.
In what context should assessment occur?	This unit needs to be assessed in a workplace practising, or beginning to implement, 5S.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit could be assessed concurrently with a unit on continuous improvement, or in conjunction with a technical unit related to the process. This unit differs from <i>MSACMT440A Lead 5S in a manufacturing environment</i> which applies to those who also need to help others apply 5S.
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, 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?	There needs to be evidence that this is a consistent part of their routine work life, and as such, evidence is needed over an extended period.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. 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.

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 production process on the production floor. As a first step, clear the work area of all non-essential equipment and materials. Remove anything either not required to produce the product or adjust the machine during the process. This helps to get rid of a 'just in case' mentality.
Items in work area	Items in work area include tools, jigs/fixtures, materials/components, plant and equipment, manuals, personal items (such as bags, lunch boxes, posters), safety equipment and personal protective equipment, and any other item which happens to be in the work area.
Set in order	After removing unnecessary materials, the remaining materials must be those that are required immediately for either the machine or the job at hand. All of these materials/change/parts etc must have an assigned location on the production floor. Locations should be clearly marked and labelled to show what belongs where.

RANGE STATEMENT	
Shine	The work area should be kept clean at all times. Cleaning must be carried out to a regular daily schedule against allowed time and, on most occasions, at the end of a job.
Standardise	Once 5S is established, standardising activities help maintain the order and the housekeeping standards. Standardising may use procedures and checklists developed from a procedure.
Sustain	Sustain means making sure that daily activities are completed every day regardless of circumstance. A job should always be cleaned up once finished regardless of the urgency of the next job. Informal inspections should be done often, at least weekly. Formal inspections of each area should be carried out at least monthly. Specific actions should be followed up. This will generate continuous improvement.
Procedures	Procedures include all work instructions, standard operating procedures, formulas/recipes, batch sheets, temporary instructions and similar instructions provided for the operation of the plant. They may be written, verbal, computer based or in some other form. For the purposes of CM, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Good Manufacturing Practice (GMP), Responsible Care) and government regulations.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT250A Monitor process capability

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills 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

Application of the unit	In a typical scenario an organisation has adopted either six sigma or statistical process control/ three sigma as a means of determining and improving the capability of their process. The team member is involved in this in collecting specified data and performing specified manipulations to the data (typically by plotting on a chart or by entering into a specified computer program). The information is typically presented to the team member 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 production information and requires initiative, enterprise and problem solving in identifying production variations and making improvement recommendations.

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. Collect and process data	1.1. Take specified measurements/readings as required 1.2. Enter data onto log/into computer or other record 1.3. Manipulate and/or chart data as required by <i>procedures</i> 1.4.
2. Identify variations that are not random and take action	2.1. Examine chart and/or reliability information 2.2. Distinguish between <i>random variations</i> and those with an identifiable cause 2.3. Take action specified in <i>procedures</i> when a variation with an <i>identifiable cause</i> occurs
3. Assist in process improvement	3.1. Collect data for process capability improvement trials as directed 3.2. Make recommendations for improvement as required 3.3. Implement revised capability monitoring

ELEMENT	PERFORMANCE CRITERIA
	<i>procedures</i> as required

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- problem solving
- statistical control
- planning
- communication

Required knowledge

- data collection methods
- 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

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 performing this unit would be expected to collect the correct data at the required frequency, perform the required manipulations on the data and then recognise assignable causes and take the required action (which may just be reporting).

What are the specific resource requirements for this unit?

Access to a work place utilising either 6 sigma or 3 sigma is required. Where it is necessary to use synthetic information for assessment purposes, then a

EVIDENCE GUIDE	
	bank of such information should be created.
What critical aspects of evidence are 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 ignored.
In what context should assessment occur?	Assessment will need to occur in a workplace implementing either 3 sigma or 6 sigma.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be assessed concurrently with a continuous improvement or a quality unit. This unit is related to: • <i>MSACMT450A Undertake process capability improvements, and</i> • <i>MSACMT650A Determine and improve process capability</i> which apply to the intermediate and highest skill levels in CM respectively. It may also be appropriate to relate this unit to <i>MEM15001B Perform basic statistical quality control</i> and possibly also <i>MEM15008B Perform advanced statistical quality control</i> where the person is required to perform statistical manipulations (i.e. where these are not done automatically for the person eg by a computer system).
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, 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.

EVIDENCE GUIDE	
	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?	Evidence of the routine collection and processing of data should be available from the workplace. Consistent interpretation of information should also be available from the workplace, although this may need to be supplemented with synthetic data as above. The interpretation of multiple assignable causes is more important than the consistent interpretation of one type of assignable cause.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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.	
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 manufacturing 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 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.

RANGE STATEMENT	
	For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (eg Good Manufacturing Practice (GMP), Responsible Care) and government regulations.
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	Also referred to as an 'assignable cause' or a 'special cause' are those variations for which a cause can be found and so the cause of the variation eliminated.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT251A Apply quality standards

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit is based on <i>LMTQAGN01A Apply quality standards</i>. This unit covers the skills and knowledge required to apply quality standards to work operations in a manufacturing enterprise.

Application of the Unit

Application of the unit	In a typical scenario, an employee 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

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 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 concerned 1.3. Identify and isolate faulty pieces/components or final products/batches 1.4. Record and/or report the faults and any identified causes to the supervisor concerned where required in accordance with workplace <i>procedures</i>
2. Assess quality of received component parts/materials	2.1. Continuously check received materials, component parts or final products against workplace standards and specifications for conformance 2.2. Demonstrate an understanding of how the received materials or component parts relate to the current operation and how they contribute to the final quality of the product 2.3. Identify and isolate faulty material or component parts related to the operator's work

ELEMENT	PERFORMANCE CRITERIA
	2.4. Record and/or report the faults and any identified causes to the supervisor concerned where required, in accordance with workplace procedures 2.5. Identify causes of any identified faults and take corrective action specified in the workplace procedures
3. Measure parts/materials	3.1. Measure materials, component parts 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 the quality and other indicators of production 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 materials, component parts or final products, as required, using the appropriate measuring techniques in accordance with workplace procedures 5.2. Recommend suitable preventative action based on workplace quality standards and the identified causes of deviations from specified quality standards of materials, component parts or final products

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- interpret work instructions, specifications, standards and patterns appropriate to the assessee's work
- carry out relevant visual inspections of materials, component parts and final products
- carry out relevant physical/chemical measurements or tests
- maintain accurate work records in accordance with procedures
- carry out work in accordance with OHS policies and procedures
- meet work specifications

REQUIRED SKILLS AND KNOWLEDGE

- communicate effectively within defined workplace procedures
- interpret and apply defined procedures

Required knowledge

- 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**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

Competence should be demonstrated in the appropriate work context dependent on the level of responsibility being exercised.

Work is assessed in accordance with enterprise quality standards, relevant statutory requirements, organisation insurance requirements, OHS legislation, manual handling procedures and relevant health regulations.

What are the specific resource requirements for this unit?

Access to real or appropriately simulated production situations including areas, materials, equipment, and information on work specifications/patterns, relevant safety procedures and regulations, quality standards, organisation procedures and customer requirements.

What critical aspects of evidence are required to demonstrate competency in this unit?

Assessment must confirm appropriate knowledge and skills to:

- interpret, relevant work instructions, standards and specifications appropriate to the assessee's work
- check and measure the relevant quality parameters
- interpret the results of quality checks in terms of

EVIDENCE GUIDE	
	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.
In what context should assessment occur?	Assessment may occur on the job or in an appropriately simulated environment.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be assessed in conjunction with the other relevant units. In some contexts it may be necessary to use specific measuring equipment to check the quality and this may require competence in using that equipment. Where that is the case, it is appropriate to assess this unit in conjunction with that other relevant unit.
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, 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?	Applies underpinning knowledge and skills when: • interpreting work instructions, specifications, standards and patterns appropriate to the assessee's work • describing consequences • completing tasks • identifying improvements within defined procedures

EVIDENCE GUIDE

	• applying safety precautions relevant to the task • assessing operational capability of specified equipment used and work processes. Shows evidence of application of relevant workplace procedures including: • quality procedures • hazard policies and procedures including codes of practice relevant to their job within defined procedures • job procedures and work instructions • waste, pollution and recycling management processes within defined procedures • action taken promptly, accidents and incidents reported in accordance with statutory requirements and enterprise procedures • recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions among staff and others in accordance with workplace procedures • work completed systematically with attention to detail without damage to goods, equipment or personnel.
What evidence is required for demonstration of consistent performance?	Applies underpinning knowledge and skills when: • interpreting work instructions, specifications, standards and patterns appropriate to the assessee's work • describing consequences • completing tasks • identifying improvements within defined procedures • applying safety precautions relevant to the task • assessing operational capability of specified equipment used and work processes. Shows evidence of application of relevant workplace procedures including: • quality procedures • hazard policies and procedures including codes of practice relevant to their job within defined procedures • job procedures and work instructions • waste, pollution and recycling management

EVIDENCE GUIDE

	processes within defined procedures • action taken promptly, accidents and incidents reported in accordance with statutory requirements and enterprise procedures • recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions among staff and others in accordance with workplace procedures • work completed systematically with attention to detail without damage to goods, equipment or personnel.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. 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.

Work site environment	Work may be conducted in a large scale production or small business situation.
Quality parameters	Quality parameters may include: • finish • size • durability • product variations • materials • alignment • colour • damage and imperfections.
Quality checks	Quality checks may include: • visual inspection • physical measurements • chemical tests • checks against patterns, templates and guides.

RANGE STATEMENT	
Measure	Measure includes those measurements which may be taken by the employee in the work place/at their work station.
Procedures	Procedures include all work instructions, standard operating procedures, formulas/recipes, batch sheets, temporary instructions and similar instructions provided for the operation 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 Good Manufacturing Practice (GMP), Responsible Care) and government regulations.
Indicators of production performance	Indicators of production performance include things like number of items/production rate, delays and causes of delays (where known) and 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 in this unit is used to mean following set procedures defined for such investigations. These procedures could include verbal instructions, documented procedures or other quality procedures as implemented within an enterprise or work environment.
Workplace context	Work organisation procedures and practices relating to the manufacture and quality outcomes for products. Conditions of service, legislation and industrial

RANGE STATEMENT	
	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. Communication may be oral, written or visual and can include simple data.
Being responsible for the maintenance of own work quality	Being responsible for the maintenance of own work quality may include being required to contribute to the quality improvement of team or section output, where necessary, in accordance with workplace procedures. Safety, environmental, housekeeping and quality are as specified by materials/machine/equipment manufacturers, regulatory authorities and the enterprise.
Applicable regulations and legislation	Applicable regulations and legislation may include: • Occupational Health and Safety (OHS) legislation relevant to workplace activities • workers' compensation legislation.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT260A Use planning software systems in manufacturing

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed to access planning software (often known as ERP, MRP, MRPII, and often by its brand name, such as SAP) to make routine business decisions required of the person as a regular part of their job.

Application of the Unit

Application of the unit	In a typical scenario, an organisation has introduced a planning software system which the employees now must interface with. At its simplest level this is just an information system. However when fully implemented the planning software system can be used as a tool for 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

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 interface	1.1. Use keyboards, track ball/mouse and monitor and/or other peripherals to access system 1.2. Navigate through the system and the screens 1.3. Acknowledge messages 1.4. Input and output information in the required format
2. Access information	2.1. Obtain relevant data and information from the system 2.2. Identify the status of items in the <i>value chain</i> 2.3. Access historical data and information 2.4. Interpret information and prioritise actions
3. Take appropriate actions in accordance with procedures	3.1. Take actions in response to information 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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- keyboarding/mousing
- communication
- teamwork
- problem solving

Required knowledge

- technical knowledge and skills needed to operate process
- hierarchy of planning software system and operation
- information available from and business activities exercised by/through the planning software 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 this training package.

Overview of assessment requirements	The employee will routinely use the relevant parts of the planning software system for their job.
What are the specific resource requirements for this unit?	Access to an organisation using a planning software system.
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of routine use of planning software as part of their job is required.
In what context should assessment occur?	Assessment needs to occur in a workplace using a planning software system or a simulation system.
Are there any other units which could or should be assessed with this unit or which relate directly to this	This unit should be assessed concurrently with relevant technical units for the process. This unit covers the lower skill levels of using planning

EVIDENCE GUIDE	
unit?	software. <i>MSACMT460A Use planning software systems in manufacturing</i> and <i>MSACMT660A Develop the application of enterprise systems in manufacturing</i> cover the intermediate and highest skill levels in the CM respectively.
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, 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?	Evidence of routine use over an extended period should be available. Planning software systems will typically log all interactions with it. Interrogation of the planning software system will therefore provide evidence of the operator's use of it. Actions taken may also be accessible from the planning software system itself, or may need other evidence available from the process.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. 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	
Planning software	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, SAP, MRP/MRP II.
Value chain	Competitive manufacturing organisations encompass the entire production system, beginning with the customer, and includes the product sales outlet, the final assembler, product design, raw material mining and processing and all tiers of the value chain (sometimes called the supply chain). Any truly 'competitive' system is highly dependent on the demands of its customers and the reliability of its suppliers. No implementation of competitive manufacturing can reach its full potential without including the entire 'enterprise' in its planning.
Procedures	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 Good Manufacturing Practice (GMP), Responsible Care) and government regulations.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT270A Use sustainable energy practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the skills needed to use and make improvements in sustainable energy practices in production, maintenance and logistics.

Application of the Unit

Application of the unit	In a typical scenario, a team member will be aware of energy use. Some of this energy use is necessary but typically a large part of energy use is unnecessary waste and so should be eliminated. The team member will observe energy use and ensure it is according to the organisation's plans and will also engage in continuous improvement for energy use. This unit requires the application of skills associated with interpreting workplace information on energy use and using procedures and technology to minimise energy use and waste.

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 energy use	1.1. Identify energy consuming processes in relation to own work 1.2. Recognise the type/source of <i>energy</i> consumed
2. Follow energy conservation plans	2.1. Check energy use in accordance with conservation plans 2.2. Identify most efficient or appropriate equipment or procedures to comply with conservation plans 2.3. Identify any uses which do not comply with conservation plans 2.4. Take action in accordance with procedures to bring energy use back in line with conservation plans
3. Improve energy use	3.1. Note any waste of energy use 3.2. Recommend improvements to energy use

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.

REQUIRED SKILLS AND KNOWLEDGE
Required skills
• analysis • basic mathematics • communication • problem solving
Required knowledge
• types and sources of energy relevant to the process • basic principles of energy efficiency • process needs for energy

Evidence 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 team member will be able to identify the energy use of any/all parts of the process and recommend better ways of using it.
What are the specific resource requirements for this unit?	Access to an organisation seeking to improve its energy usage.
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of conformance to energy usage plans and suggestions for improvement should be available.
In what context should assessment occur?	Assessment needs to be conducted in an organisation where energy is a significant cost component or by use of a project, simulation or case study.
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 general environmental practices, and • <i>MSACMT670A Develop and manage sustainable energy practices</i> - which covers higher level aspects.

EVIDENCE GUIDE**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, 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?

Evidence should be available from the daily routine of the job to show that there is consistent performance.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. 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.

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
- movement and transport

RANGE STATEMENT	
	• 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.
Energy	Energy is used to mean 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, lighting, moving materials (including pumps and conveyors), modifying materials (including cutting, forming, weaving, knitting, reacting, moulding, extruding, mixing), generating pressure/vacuum or providing motive power for equipment and transport.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT271A Use sustainable environmental practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed to use and make improvements in sustainable environmental practices in production, maintenance and logistics.

Application of the Unit

Application of the unit	In a typical scenario, a team member will be aware of environmental resource use. Some of this is necessary but typically a large part of environmental resource use may be unnecessary waste and so should be eliminated or at least minimised. The team member will observe resource use and ensure it is according to the organisations plans and will also engage in continuous improvements for resource use. This unit requires the application of skills associated with applying workplace information on use of resources and managing own application of technology and workplace practices to minimise use and waste of resources.

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 resource use	1.1. Identify resources used by processes in area of responsibility 1.2. <i>Recognise</i> the type/source of resource used 1.3. Identify sources of information to expand knowledge and understanding of resources used
2. Comply with environmental obligations	2.1. Follow procedures to ensure there is no breach of environmental regulations/licence conditions 2.2. Identify situations related to job which may lead to a breach of regulations/licence conditions
3. Follow resource conservation plans	3.1. Identify resource conservation plan/section of plan relevant to area of responsibility 3.2. Identify most efficient or appropriate equipment or processes to comply with conservation plans 3.3. Check resource use is in accordance with plan 3.4. Sort/recycle waste according to procedures 3.5. Note any uses which do not comply with plan 3.6. Take appropriate action specified in plan to bring resource use back in line with plans 3.7. Apply energy conservation plans to the use of equipment and tools
4. Improve resource use	4.1. Identify waste of resource use 4.2. Recommend improvements to resource use

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
• analysis • basic mathematics • communication • problem solving
Required knowledge
• the '3 Rs' - reduce, re-use, recycle • regulatory/licensing requirements relevant to the process/plant • types and sources of resource • basic principles of resource efficiency • process needs for resource

Evidence 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 competent team member will be able to identify the resource use of any/all part/s of the process and recommend better ways of using it.
What are the specific resource requirements for this unit?	Access to an organisation seeking to improve its resource usage.
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of conformance to resource usage plans and suggestions for improvement should be available.
In what context should	Assessment needs to be conducted in an organisation where

EVIDENCE GUIDE	
assessment occur?	resource is a significant cost component or by project, simulation or case study.
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>MSACMT270A Use sustainable energy practices - which covers energy specifically, and</i> • <i>MSACMT671A Develop and manage sustainable environmental practices - which covers the higher skill levels.</i>
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, 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?	Evidence should be available from the daily routine of the job to show that there is consistent performance.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. 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	
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 • 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 (for example 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.
Resource	Resource is used to mean resources used by the process be it raw materials, components, process water, cooling water, cleaning water and so on.
Recognise	Recognition of type of resource is at an appropriate level for the person and the area and includes things like recognising steam/electric heating, cooling water/refrigerated cooling, raw materials waste materials.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT280A Undertake root cause analysis

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed to undertake root cause analysis (RCA) by any person. This will often be done 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

Application of the unit	In a typical scenario, the employee works in an organisation which is applying competitive manufacturing strategies. This involves the operator 'owning' their process, taking responsibility for it, undertaking root cause analysis of problems and generally contributing to increasing the uptime and general Overall Equipment Efficiency (OEE). This unit requires an ability to seek and apply information from a variety of sources in order to inform problem solving analyses. Initiative and enterprise is also required to identify quick fix and permanent solutions to problems.

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. Recognise problems	1.1. Identify equipment/plant characteristics indicative of a problem 1.2. Identify process conditions/product characteristics indicative of a problem 1.3. Use appropriate techniques/charts to define the problem
2. Implement quick fix	2.1. Recommend/implement 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 information to eliminate/confirm causes 3.3. Construct a cause and effect diagram from available data 3.4. Seek assistance as required 3.5. Identify root cause
4. Develop permanent solution	4.1. Identify a range of methods of eliminating the root cause/ breaking the <i>cause tree</i> 4.2. Select the most appropriate solution

ELEMENT	PERFORMANCE CRITERIA
	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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- analysis
- problem solving
- communication
- documenting

Required knowledge

- root cause analysis methodology
- indicators of a problem
- principles of the process sufficient to undertake a RCA and propose solutions
- use of relevant analysis tools (eg cause/effect diagrams, Pareto charts, 4W)

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide describes the underpinning knowledge and skills that must be demonstrated to prove competence. It is essential for assessment and must be read in conjunction with the performance criteria, the range statement and the assessment guidelines of the relevant training package

Overview of assessment requirements

The competent operator will be able to recognise problems in their process and undertake a root cause analysis, either alone or with assistance and propose permanent solutions.

What are the specific resource

Access to an organisation using root cause

EVIDENCE GUIDE	
requirements for this unit?	analysis.
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of root cause analyses undertaken should be available.
In what context should assessment occur?	Assessment will need to occur in an organisation implementing root cause analysis or by simulation or project.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit could be assessed concurrently with other units dealing with the improvement of the process. This unit could be co-assessed (and delivered) with: • <i>MSAPMSUP390A Use structured problem solving tools</i> • <i>MEM15001B Perform basic statistical quality control.</i> This unit is related to <i>MSACMT281A Implement a predictive maintenance strategy</i> as root cause analysis is one tool used in predictive maintenance.
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, 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.

EVIDENCE GUIDE

What evidence is required for demonstration of consistent performance?

Generally a range of root cause analysis activities will be required in order to generate 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.

Root cause

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.

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 in such a way that the problem cannot recur is an acceptable alternative.

Not all situations can wait for the **root cause analysis** and eventual elimination of the root cause as there are serious current impacts. The **quick fix** will control these immediate impacts, but does not eliminate the root cause.

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%.

Appropriate techniques/charts

Appropriate techniques/charts may include the following:

- control charts
- Pareto charts

RANGE STATEMENT	
	• run charts • flow charts • cause and effect diagrams • tree diagrams • 4W analysis.
Overall Equipment Efficiency (OEE)	Overall Equipment Efficiency (OEE) is the combination of the main factors causing loss of productive capacity from equipment/plant and is: <i>OEE = availability x performance x quality rate</i> 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, re-works and start up waste.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT281A Contribute to the application of a proactive maintenance strategy

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills required to make a positive contribution to proactive maintenance strategies which include things like plant uptime and Overall Equipment Efficiency (OEE).

Application of the Unit

Application of the unit	In a typical scenario, an organisation is following a predictive, preventative or reliability centred maintenance strategy and this 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 and initiative and enterprise to continually monitor and maintain operational performance of equipment/plant used in work role.

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 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 <i>procedures</i> and own level of responsibility 1.3. Access manufacturer manuals/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 the procedures 2.2. Regularly check equipment/plant Overall Equipment Efficiency (OEE) 2.3. Note any deviation from conditions specified in procedures

ELEMENT	PERFORMANCE CRITERIA
	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 competency and authority on deviation	4.1. Liaise with relevant people regarding the deviation and the solution 4.2. Implement solution/assist with the implementation of the solution as appropriate

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- mathematical literacy
- analysis
- problem solving
- communication

Required knowledge

- normal behaviour of the equipment/plant
- indicators of abnormal performance
- principles of operation sufficient to recognise problems and propose solutions
- appropriate cleaning and adjusting for the equipment/plant/area as required by 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 this training package.

EVIDENCE GUIDE	
Overview of assessment requirements	The employee should 'own' their plant/equipment and take a lead role in ensuring that it is always operating in peak condition and with high and increasing OEE.
What are the specific resource requirements for this unit?	Access to a plant using a proactive maintenance strategy.
What critical aspects of evidence are required to demonstrate competency in this unit?	There should be evidence of deviations recognised and appropriate solutions implemented.
In what context should assessment occur?	Assessment needs to occur in an organisation using a predictive maintenance strategy.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be assessed concurrently with other units dealing with maintenance. This unit is related to: • <i>MSACMT280A Undertake root cause analysis which is one of the analysis tools, and also to</i> • <i>MSACMT481A Undertake proactive maintenance analyses,and</i> • <i>MSACMT681A Develop a proactive maintenance strategy</i> which cover the intermediate and high skill levels respectively.
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, 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.

EVIDENCE GUIDE**What evidence is required for demonstration of consistent performance?**

Evidence should be required from a range of activities indicating that the maintenance and monitoring elements are a routine part of the job and that the identification of patterns and taking action has occurred in a range of situations.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. 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.

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%.

Overall Equipment Efficiency (OEE)

Overall Equipment Efficiency (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, re-works and start up waste.

Procedures

Procedures include 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 Good Manufacturing Practice (GMP), Responsible Care) and government

RANGE STATEMENT

	regulations.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT430A Improve cost factors in work practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed 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

Application of the unit	In a typical scenario, a person is able 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 work within a team and the improvement of throughput and cycle times. Decisions are made within the scope of the team's authority 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 team processes. Initiative, enterprise, planning and organising are also required 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

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 cost components of team's function	1.1. Identify <i>cost components</i> in the product or <i>process</i> 1.2. Identify costs factors under control of the team 1.3. Identify causes of variability in costs 1.4. Analyse impact of costs on production or process activities undertaken by team
2. Improve cost efficiency of team processes	2.1. Identify methods of improving productivity and/or reducing costs within team's area of responsibility 2.2. Determine cost/ <i>benefit</i> ratio of alternative methods 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

ELEMENT	PERFORMANCE CRITERIA
	consultation with relevant stakeholders

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- basic numeracy.

Required knowledge:

- cost components of products made
- costs concepts such as expense, income and cost benefit
- major cost contributors to product (e.g. energy)
- the difference between internally and externally controlled costs
- difference between overhead, labour and consumables.

Evidence 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 as part of their routine decision making aim to maximise the cost efficiency of their work team within their scope of authority. There should be evidence of their doing so.
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of routinely analysing cost factors relevant to their team's operation and implementing improvements to the team's cost efficiency.
In what context should assessment occur?	Assessment will need to occur in a workplace or by use of a work based case study.
Are there any other units which could or should be assessed with this	This unit may be assessed concurrently with appropriate units on continuous improvement.

EVIDENCE GUIDE	
unit or which relate directly to this unit?	
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, 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?	Evidence should be available over a period of time or from more than one process or product.
What are the specific resource requirements for this unit?	Access to a workplace implementing competitive manufacturing strategies. No other specific resources are 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. Essential operating conditions that may be 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	
Cost components	Cost components may include fixed and variable costs such as power/energy, materials, plant and equipment, salary and wages, office expenses such as telephone, and government taxes and charges.
Process	Process may include a production, maintenance, logistics or office process in a manufacturing environment.
Procedures	Procedures include 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 (e.g. Good Manufacturing Practice (GMP), Responsible Care) and government regulations.
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	CM Tools

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMT440A Lead 5S in a manufacturing environment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the competencies needed to facilitate and improve the 5S housekeeping environment.

Application of the Unit

Application of the unit	In a typical scenario, an organisation is implementing or practising a 5S approach to housekeeping. While 5S places much of the responsibility on team members, team leaders need to support, encourage and facilitate effective 5S in the workplace. The manufacturing environment for 5S may include the warehouse, tool shops, office etc. This unit requires the application of skills associated with communication, teamwork, problem solving, initiative, enterprise, planning, 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.

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. Facilitate the set up of 5S	1.1. Assist team members to determine what are necessary and unnecessary items in the work area 1.2. Assist team members 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 team members to determine optimum location for unnecessary items 1.5. Assist team members to determine 5S schedule 1.6. Ensure <i>procedures</i> reflect 5S practices 1.7. Assist team members to achieve the required level of skill
2. Monitor 5S	2.1. Check work area for 5S implementation as part of normal routine 2.2. Identify non-conformances 2.3. Negotiate solutions to non-conformances

ELEMENT	PERFORMANCE CRITERIA
3. Improve the 5S	3.1. Work with team members to find areas for improvement 3.2. Assist team members to develop improvement solutions 3.3. Facilitate the availability of resources required for the improvement solution 3.4. Facilitate the implementation of the improvement solution

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- communication
- planning
- organising
- prioritising
- reading and interpretation
- recording
- problem solving
- teamwork.

Required knowledge:

- meaning and application of 5S to their job
- principles of efficient workplace organisation
- purposes of 5S
- procedures relevant to job
- identification of skill gaps
- methods of addressing skill gaps
- ways of encouraging team members to find and suggest areas for improvement
- methods of making/recommending improvements
- methods of accessing required resources
- OHS

Evidence 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	There should be evidence of successful application of 5S in the person's work group and their positive interaction with it.
What critical aspects of evidence are required to demonstrate competency in this unit?	There should be evidence of the person's assisting team members to implement 5S and/or to implement improvements to 5S. There should be evidence of continuous improvement.
In what context should assessment occur?	Assessment needs to occur in a workplace practising or implementing 5S.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit could be assessed concurrently with other units relating to the team leader's interactions with their team. This unit differs from <i>MSACMT240A Apply 5S procedures in a manufacturing environment</i> which covers the application of 5S to the person's own work.
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, 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

EVIDENCE GUIDE	
	of the assessment.
What evidence is required for demonstration of consistent performance?	5S needs to be a routine, natural part of everyone's job. As such there should be evidence of consistent application of 5S over an extended period.
What are the specific resource requirements for this unit?	Access to a workplace implementing or practising 5S. No other specific resources are 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. Essential operating conditions that may be 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 include 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 (e.g. Good Manufacturing Practice (GMP), Responsible Care) and government regulations.
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

Unit Sector(s)

Unit Sector	CM Tools

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMT441A Facilitate continuous improvement in manufacturing

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills required to facilitate continuous improvement (kaizen) in an organisation.

Application of the Unit

Application of the unit	In a typical scenario, this unit would apply to a team leader with responsibility for facilitating ongoing continuous improvement of the manufacturing process within the scope of their team's area of responsibility. This unit requires the application of skills associated with communication, teamwork, problem solving, initiative, enterprise, planning and organising in order to develop a continuous improvement process. This unit has a strong emphasis on developing and resourcing a team to embrace continuous improvement 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. Facilitate improvement team.	1.1. Assist the improvement team consider and select appropriate improvement projects 1.2. Facilitate resources and arrangements for the team to undertake improvement projects 1.3. Arrange for the provision of required data 1.4. Assist the improvement team develop <i>scope and benefit statements</i> 1.5. Organise for ongoing training of improvement team members as required
2. Build a continuous improvement process.	2.1. Organise for training as required for work group members 2.2. Encourage work group members to routinely monitor <i>key process indicators</i> 2.3. Build capacity in the work group to critically review the relevant parts of the value chain 2.4. Assist work group members to formalise improvement suggestions 2.5. Facilitate relevant resources and assist work group members to develop implementation plans 2.6. Monitor implementation of improvement plans taking appropriate actions to assist implementation where required.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- analysis
- problem solving
- planning and organising
- communication
- negotiation
- documenting

Required knowledge:

- continuous improvement process.

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide describes the underpinning knowledge and skills that must be demonstrated to prove competence. It is essential for assessment and must be read conjunction with the performance criteria, the range statement and the assessment guidelines of the relevant Training Package

Overview of assessment requirements

Assessment should confirm the ability to facilitate the use of continuous improvement at a team level within a manufacturing organisation

What critical aspects of evidence is required to demonstrate competency in this unit?

Evidence of the facilitation of continuous improvement should be available

In what context should assessment occur?

Assessment will need to occur in an organisation using continuous improvement or by project.

Are there any other units which could or should be assessed with this unit or which relate directly to this unit?

This unit could be assessed concurrently with other relevant units.

EVIDENCE GUIDE	
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, 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?	Generally routine continuous improvement by the work group and improvement team(s) from the work group would be needed to generate sufficient evidence
What are the specific resource requirements for this unit?	Access to an organisation using continuous improvement.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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.	
Scope and benefit	Scope and benefit statements of improvement project

RANGE STATEMENT	
statements	may include: • description of the business • the target work process • what the 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.
Key process indicators	Key process indicators may include: • statistical process control data/charts • orders • lost time, injury and other OHS records • equipment reliability charts • etc.

Unit Sector(s)

Unit Sector	CM Tools

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMT450A Undertake process capability improvements

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills required by a team leader/technical expert to analyse data from the process, develop improvements to eliminate variation due to assignable causes and then implement actions.

Application of the Unit

Application of the unit	In a typical scenario, a person reviews a range of process capability data and information, makes some changes/arranges for changes to be made to procedures, equipment or process and then recalculates the process capability. Process capability may have been determined using either a six sigma (6?) or three sigma (3?) process. 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.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	MSACMT452A	Apply statistics to processes in manufacturing

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. Obtain required data	1.1. Identify process for study 1.2. Obtain/organise to obtain required data/information
2. Analyse information	2.1. Analyse past data and determine assignable causes 2.2. Develop possible improvements to eliminate assignable causes 2.3. Incorporate own experience and learning into proposed process improvements
3. Improve process capability	3.1. Liaise with relevant people to implement improvements 3.2. Obtain required authorities to implement improvements 3.3. Obtain/organise to obtain required data for improved process 3.4. Recalculate process capability 3.5. Implement revised data collection/processing and new capability information

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- mathematical
- statistical methods
- communication
- negotiation
- planning
- analysis
- problem solving
- teamwork
- computer operation.

Required knowledge:

- 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

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 should be able to analyse a process and recalculate process capability/trial limits after changes have been made.

What critical aspects of evidence are required to demonstrate

Evidence should be available of the analysis of process information and the recalculation of process

EVIDENCE GUIDE	
competency in this unit?	capability/trial limits. The improvements made may be as a result of continuous improvement with the process capability being recalculated periodically, or the improvement may be as a result of an improvement project with the process capability recalculated as part of that project.
In what context should assessment occur?	Assessment may occur in an organisation which uses process capability to monitor its process and as a tool for improving its process or may occur using a specific project/projects to improve process capability.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be assessed concurrently with a continuous improvement unit. This unit is related to: • <i>MSACMT250A Monitor process capability</i>, and • <i>MSACMT650A Determine and improve process capability</i> which apply to the lower and higher skill levels in CM respectively. It may also be appropriate to relate this unit to <i>MEM15008B Perform advanced statistical quality control</i> where the person is required to perform statistical manipulations (i.e. where these are not done automatically for the operator e.g. by a computer system).
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, 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

EVIDENCE GUIDE	
	agreed with the assessee prior to the commencement of the assessment.
What evidence is required for demonstration of consistent performance?	This should normally be a routine part of the team leader's job. Where improvements result from a continuous improvement/kaizen process, then a few rounds of improvement and capability recalculation should be required as evidence of competence. Where the improvements results from an improvement project, and this is a complex project and includes the recalculation and implementation of the revised process capability, then one project may be provide sufficient evidence.
What are the specific resource requirements for this unit?	Access to an organisation using process capability to control and improve its process.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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.	
Six sigma (6s)	Six sigma is 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 manufacturing approach. Six sigma training typically covers several units of competency in this Training Package.
Three sigma (3s)	Traditional statistical process control uses three sigma limits which equates to 3 defects per thousand opportunities for each product or service transaction.
Procedures	Procedures include 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

RANGE STATEMENT

	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 (e.g. Good Manufacturing Practice (GMP), Responsible Care) and government regulations.

Unit Sector(s)

Unit Sector	CM Tools

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMT451A Mistake proof a production process

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed to make changes which prevent errors and/or backsliding to a pre-improvement level of practice. In the CM environment, this unit would typically be done by a team leader, technical expert of similar person.

Application of the Unit

Application of the unit	In a typical scenario a person needs to analyse the process that a team is responsible for and determine methods of <i>mistake proofing</i> it (i.e. ensuring it only produces product within an, acceptable range). 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 team building 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

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 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 method of performing operation 2.2. Test and validate mistake proofing
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 the workforce has an appropriate skills set 3.4. Follow through to ensure implementation occurs

ELEMENT	PERFORMANCE CRITERIA
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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- communication ability to discuss items with both operators and technical support personnel
- problem solving
- analysis
- team work
- design conceptualisation.

Required knowledge:

- understanding of their process
- factors in the process which may cause variability
- methods of controlling the variability in the process
- mistake proofing methods relevant to the process/product.

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 this training package.

Overview of assessment requirements	The person will be able to analyse their process and implement systems to ensure the process is mistake proof and the operators, work in a predictable way with little or no chance of mistake.
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of actions taken to mistake proof the process should be available.
In what context should assessment occur?	Assessment needs to occur in a workplace implementing competitive manufacturing or by using a suitable project.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be used as a stand alone unit or it may be assessed concurrently with any of: • <i>MSACMT250A Monitor process capability</i> • <i>MSACMT450A Undertake process capability improvements</i> • <i>MSACMT650A Determine and improve process capability.</i>
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, 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	Where evidence is from the application of <i>baka-yoke</i> to

EVIDENCE GUIDE	
demonstration of consistent performance?	continuous improvement, then there should be evidence that it is practiced routinely and from a number of standardisation activities. Where the evidence is from an initial standardisation of a process, or a single, large and complex standardisation/change process the may provide sufficient evidence.
What are the specific resource requirements for this unit?	Access to an organisation using a competitive manufacturing approach.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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.	
Mistake proofing	Sometimes known as baka-yoke/poka-yoke, a manufacturing technique of preventing mistakes by designing the manufacturing process, equipment, tools and components/subassemblies etc so that an operation literally cannot be performed incorrectly. An attempt to perform incorrectly, as well as being prevented, is usually met with a warning signal of some sort.
Procedures	Procedures include all work instructions, standard operating procedures, formulas/recipes, batch sheets, temporary instructions and similar instructions provided for the operation 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 (e.g. Good Manufacturing Practice (GMP), Responsible Care) and government regulations.

Unit Sector(s)

Unit Sector	CM Tools

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMT452A Apply statistics to processes in manufacturing

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills required to apply statistical theory and principles to the analysis and control of processes in manufacturing.

Application of the Unit

Application of the unit	In a typical scenario, statistical process control is being used on a process in a manufacturing organisation. Usually this will be to monitor the process and determine when action needs to be taken. The appropriate action will then be taken in accordance with standard procedures. To do this the person will apply their knowledge of frequency distribution and variation to the data/chart to distinguish between random and non-random variation and their 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

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. 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

ELEMENT	PERFORMANCE CRITERIA
	3.3. Plot limits on control chart 3.4. Explain impact of limit to relevant stakeholders

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- analysis
- problem solving
- communication
- documenting
- calculations
- use of statistics

Required knowledge:

- sampling techniques
- purpose of sampling and measurement
- random, systematic, stratified sampling
- relevance, reliability and representativeness of samples/data collected
- 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 causes of variation in a process
- the meaning of broad/ narrow frequency distributions/ range/standard deviations and skewed distributions in process terms
- 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 (eg 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

EVIDENCE GUIDE

The Evidence Guide describes the underpinning knowledge and skills that must be demonstrated to prove competence. It is essential for assessment and must be read conjunction with the performance criteria, the range statement and the assessment guidelines of the relevant Training Package

Overview of assessment requirements	The competent person will be able to apply statistical theory to a process to interpret and reduce its variation.
What critical aspects of evidence is required to demonstrate competency in this unit?	Evidence of the application of statistical theory to a process should be available
In what context should assessment occur?	Assessment will need to occur in an organisation implementing statistical process control or by project.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit could be assessed concurrently with other units dealing with process capability and/or change management.
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, 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

EVIDENCE GUIDE	
What evidence is required for demonstration of consistent performance?	Generally the application of statistics over a period of time would be required to generate sufficient evidence
What are the specific resource requirements for this unit?	Access to an organisation using statistical control.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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.	
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 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 Good Manufacturing Practice (GMP), Responsible Care) and government regulations.

RANGE STATEMENT	
Handle data	Handle data may include: • calculating means, ranges, mean of means, standard deviation (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, or 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:

RANGE STATEMENT

	• 1 sigma warning limits • 2 sigma warning limits • 3 sigma control limits • 6 sigma limits

Unit Sector(s)

Unit Sector	CM Tools

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMT460A Facilitate the use of planning software systems in manufacturing

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills required by a team leader or technical expert to use and facilitate the use of planning software systems (known by various names such as ERP, SAP and MRP). This unit also covers the interactions of the person with a planning software system as they both use it for their own work and support their team members use it.

Application of the Unit

Application of the unit	In a typical scenario, an organisation will be using planning software. The person 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 members. The planning software system will be a routine part of their work life. 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

Prerequisite units	MSACMT260A	<i>Use planning software systems in manufacturing</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. Communicate using the planning software system	1.1. Send and receive information using planning software 1.2. Send and receive messages using planning software
2. Make decisions using planning software	2.1. Interrogate the planning software system to find required current, historical or predicted information 2.2. Take actions appropriate to the information in accordance with procedures
3. Monitor the use of planning software	3.1. Routinely monitor planning software information and use along the <i>value chain</i> 3.2. Review performance and use of planning software with team
4. Support team use planning software	4.1. Regularly communicate with team, both using planning software and face to face 4.2. Identify improvements required

ELEMENT	PERFORMANCE CRITERIA
	4.3. Take appropriate actions to implement improvements

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills:
• keyboarding/mousing • communication • teamwork • problem solving. • planning and organising
Required knowledge:
• hierarchy of planning software system and operation • information available from/through the planning software system • facilities and information offered by planning software • support/training/skill development mechanisms available for access by team members.

Evidence 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 need to be able to demonstrate an ability to understand and apply planning software to a work location or area and send, receive and interpret process and production data for that area. They should also be able to assist others in the use of the planning software system. Software editing is not required for this unit but the ability to recognise and suggest application improvements is required

EVIDENCE GUIDE	
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of competent use of planning software and also of assisting their team to use it effectively and efficiently.
In what context should assessment occur?	Assessment will need to occur on an organisation using planning software or simulation software.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be assessed concurrently with other relevant units. This unit covers the intermediate skill levels in CM for planning software. <i>MSACMT260A Use planning software systems in manufacturing</i> and <i>MSACMT660A Develop the application of enterprise systems in manufacturing</i> cover the lowest and highest skill levels respectively. <i>MSACMT260A Use planning software systems in manufacturing</i> is specified as a prerequisite, and should be applied to the person's own job.
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, 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?	Evidence of routine use over an extended period should be available. Planning software systems will typically log all interactions with it. Interrogation of the planning software system will therefore provide evidence of the operator's use of it. Actions taken

EVIDENCE GUIDE	
	may also be accessible from the planning software system itself, or may need other evidence available from the process.
What are the specific resource requirements for this unit?	Access to an organisation using planning software.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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.	
Planning software	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, SAP or MRP/MRP II. In some cases it can be integrated with engineering applications such as Systems Control and Data Acquisition (SCADA) systems. In such cases <i>MSACMT261A Use SCADA systems in manufacturing</i> may also be required. Competitive manufacturing organisations encompass the entire production system, beginning with the customer, and includes the product sales outlet, the final assembler, product design, raw material mining and processing and all tiers of the value chain (sometimes called the supply chain). Any truly 'competitive' system is highly dependent on the demands of its customers and the reliability of its suppliers. No implementation of competitive manufacturing can reach its full potential without including the entire 'enterprise' in its planning.
Value chain	Competitive manufacturing organisations encompass the entire production system, beginning with the customer, and includes the product sales outlet, the final assembler, product design, raw material mining and processing and all tiers of the value chain (sometimes

RANGE STATEMENT	
	called the supply chain). Any truly 'competitive' system is highly dependent on the demands of its customers and the reliability of its suppliers. No implementation of competitive manufacturing can reach its full potential without including the entire 'enterprise' in its planning .

Unit Sector(s)

Unit Sector	CM Tools

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMT481A Undertake proactive maintenance analyses

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the skills needed for the most common forms of analyses associated with predictive maintenance strategies.

Application of the Unit

Application of the unit	In a typical scenario, a technical expert (usually an engineer, technician or tradesperson) will be required to undertake analyses for the purpose of predictive/preventative/reliability centred maintenance as part of a competitive manufacturing 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

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. Liaise with operator	1.1. Establish a relationship with the operator/s 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 <i>Overall Equipment Efficiency (OEE)</i> 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 <i>Mean Time Between Failures (MTBF)</i> (or similar statistical history analysis) 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 are locked in and deterioration resolved

ELEMENT	PERFORMANCE CRITERIA
3. Undertake Failure Mode Effects Analysis (FMEA) (or similar)	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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- communication
- teamwork
- analysis
- problem solving
- mathematics
- planning
- reading and interpreting engineering specifications/drawings
- computer use
- prioritising
- recording data.

Required knowledge:

REQUIRED SKILLS AND KNOWLEDGE

- cleaning needs, techniques and principles
- methods of assessing skill gaps and filling them
- techniques for determining MTBF or similar
- techniques for undertaking FMEA or similar
- underpinning principles of competitive manufacturing strategies being implemented and how to adapt them to maintenance
- root cause analysis
- condition monitoring.

Evidence 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 undertake a range of predictive maintenance analyses as well as support operations staff, and implement an advanced maintenance strategy.

What critical aspects of evidence are required to demonstrate competency in this unit?

Evidence should be available as to the analyses undertaken and the support provided.

In what context should assessment occur?

Assessment needs to occur in an organisation using predictive maintenance strategies or a simulation in a workshop or by case study.

Are there any other units which could or should be assessed with this unit or which relate directly to this unit?

This unit may be assessed concurrently with other relevant maintenance units.

This unit is related to:

- *MSACMT280A Undertake root cause analysis*
- *MSACMT281A Contribute to the application of a proactive maintenance strategy, and*
- *MSACMT681A Develop a proactive maintenance strategy* which cover different aspects/levels of this area.

What method of assessment should apply?

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined

EVIDENCE GUIDE	
	by the elements, performance criteria, skills and knowledge. A holistic approach should be taken to the assessment. Assessors should gather sufficient, fair, valid, reliable, 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?	Generally evidence will be required from a range of predictive maintenance analyses in order to have sufficient evidence.
What are the specific resource requirements for this unit?	Access to an organisation using predictive maintenance procedures.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. 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 manufacturing	Competitive manufacturing is used to describe the range of systemic manufacturing practice concepts and approaches. It covers but is not limited to: • lean manufacturing • agile manufacturing

RANGE STATEMENT	
	• preventative and predictive maintenance approaches • monitoring and data gathering systems such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Manufacturing Resource Planning (MRP), and proprietary systems such as SAP etc. • statistical process control systems including six sigma and three sigma • Just in Time (JIT), kanban and other pull related manufacturing control systems • supply, value, and demand chain monitoring and analysis • other continuous improvement systems. Competitive manufacturing should be interpreted so as to take into account the stage of implementation of competitive manufacturing approaches, the enterprise's size and work organisation, culture, regulatory environment and manufacturing sector.
Overall Equipment Efficiency (OEE)	Overall Equipment Efficiency (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.
Mean Time Between Failure (MTBF)	Mean Time Between Failure (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

RANGE STATEMENT	
	problem.
Failure Mode and Effects Analysis (FMEA)	Failure Mode and Effects Analysis (FMEA) is a systematic approach that identifies potential failure modes in a system, product, or manufacturing/assembly operation caused by either design or manufacturing/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 HAZOP) for design and modification. Hazard and Operability Studies (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 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	CM Tools

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMT482A Assist in implementing a proactive maintenance strategy

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills required by a maintenance person to assist in the implementation of a proactive maintenance strategy in a manufacturing environment. This unit includes the interaction between maintenance worker and operator as appropriate.

Application of the Unit

Application of the unit	In a typical scenario, an organisation has adopted/is implementing <i>Total Preventative Maintenance/Total Productive Maintenance (TPM), Reliability Centred Maintenance (RCM)</i> or <i>similar strategies</i>. As part of this the maintenance personnel are 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

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 components of reliability strategy for a work/plant area	1.1. Determine manufacturer's recommended <i>inspection, servicing</i> 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. Evaluate <i>procedures</i> for plant/equipment reliability implications 2.2. Discuss current practices with relevant people to determine any plant/equipment reliability

ELEMENT	PERFORMANCE CRITERIA
3. Assist in implementing the reliability strategy	implications 2.3.Recommend changes to improve plant/equipment reliability in accordance with procedures 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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

- communication
- planning
- organising
- prioritising
- reading and interpretation
- recording
- problem solving.

Required knowledge:

- requirements of the proactive maintenance strategy being implemented
- principles of operation of the equipment/plant
- likely abilities of operations personnel with regard to inspections and servicing
- procedures relevant to job
- methods of making/recommending improvements.

Evidence 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	There should be evidence that the maintenance person is routinely applying proactive maintenance strategies in their routine work and that they are aware of why they are important. In a TPM environment, the operator needs to move to taking ownership of their equipment/plant and maintenance personnel have a role to play in helping this happen and in developing the competence of operating personnel to do so
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of schedules developed and implemented and improvements recommended.
In what context should assessment occur?	This unit needs to be assessed in a workplace practising, or beginning to implement proactive maintenance.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit could be assessed in conjunction with a technical unit related to maintenance. This unit is related to: <i>MSACMT481A Undertake proactive maintenance analyses</i> which covers the analysis skills associated with proactive maintenance. These units are complimentary and in some organisations it may be appropriate for the one person to hold both competencies. This unit is related to: <i>MSACMT681A Develop a proactive maintenance strategy</i> which is the highest level unit dealing with proactive maintenance in CM.
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?	There needs to be evidence that schedules related to proactive maintenance have been developed either in an initial implementation of a proactive maintenance strategy, or have been developed as part of continuous improvement to the proactive maintenance strategy.
What are the specific resource requirements for this unit?	Access to a plant implementing/practising proactive maintenance. No other specific resources are 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. Essential operating conditions that may be 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.	
Total Preventative Maintenance/Total Productive Maintenance (TPM)	Total Preventative Maintenance/Total Productive Maintenance (TPM) is an application of total quality management to maintenance with the intention of increasing reliability, getting it right first time and increasing <i>Overall Equipment Efficiency (OEE)</i> .
Reliability Centred Maintenance (RCM)	Reliability Centred Maintenance (RCM) moves maintenance from reactive, or even planned/programmed, towards a focus on <i>uptime</i> and

RANGE STATEMENT	
	OEE.
Similar strategies	Mean Time Between Failure (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. Failure Mode and Effects Analysis (FMEA) is a systematic approach that identifies potential failure modes in a system, product, or manufacturing/assembly operation caused by either design or manufacturing/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 HAZOP) for design and modification. Hazard and Operability Studies (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 involves often quite sophisticated monitoring of equipment including such things as vibration monitoring, instrumental analysis of lubricating oil etc to determine the current state of the equipment, monitor the change in this condition and predict when it needs servicing/maintenance to maintain reliability.
Overall Equipment Efficiency (OEE)	Overall Equipment Efficiency (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

RANGE STATEMENT	
	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, meters • observations including those using sight, hearing, smell, feel • observations of product quality/faults/rejects.
Servicing	Servicing may include: • cleaning • lubricating • topping up • adjusting.
Procedures	Procedures include 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 (e.g. Good Manufacturing Practice (GMP), Responsible Care) and government regulations.

Unit Sector(s)

Unit Sector	CM Tools

corequisite units

Corequisite units	

Functional area

Functional Area	

MSACMT640A Manage 5S system in a manufacturing environment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers knowledge and skills needed for the overall management of the 5S system in a manufacturing organisation.

Application of the Unit

Application of the unit	In a typical scenario, an organisation has decided to pursue competitive manufacturing and to adopt 5S as one of the tools. This unit covers the skills needed for ensuring the smooth operation and continuous improvement of the 5S system in plant or enterprise. 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, initiative, enterprise, planning and organising in order to ensure a 5S system in implemented in a competitive manufacturing environment. This unit also requires communication and teamwork skills to gather information about processes and implement the 5S 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	
1. Organise an appropriate environment for 5S	1.1. Arrange for team leaders to develop/maintain skills required for 5S 1.2. Ensure team leaders are developing/maintaining skills required in their team members 1.3. Ensure <i>procedures</i> and work practices reflect 5S needs and regulatory requirements 1.4. Practise 5S in own work 1.5. Eliminate <i>roadblocks</i> to 5S
2. Audit 5S implementation	2.1. Undertake spot checks of compliance 2.2. Review workplace for indicators of compliance/non-compliance 2.3. Encourage operators to routinely suggest areas for improvement 2.4. Discuss 5S routinely with team leaders to seek ideas for improvement and encourage identification of non-conformance

ELEMENT	
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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication
- planning
- organising
- prioritising
- reading and interpretation
- recording
- problem solving
- teamwork
- negotiation

Required knowledge

- meaning and application of 5S to their job
- principles of efficient workplace organisation
- purposes of 5S
- procedures relevant to jobs
- relevant regulatory requirements
- 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

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	There should be evidence of successful application of 5S in the individual's area of responsibility and their positive interaction with it.
What are the specific resource requirements for this unit?	Access to a workplace implementing or practising 5S. No other specific resources are required.
In what context should assessment occur?	Assessment needs to occur in a workplace practising or implementing 5S.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit could be assessed concurrently with other units relating to the person's interactions with their team This unit differs from <i>MSACMT440A Lead 5S in a manufacturing environment</i> which covers the intermediate skill levels in CM.
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, 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	5S needs to be a routine, natural part of everyone's job. As such there should be evidence of consistent application of 5S

EVIDENCE GUIDE

consistent performance?	over an extended period.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. 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 manufacturing

Competitive manufacturing is used to describe the range of systemic manufacturing practice concepts and approaches. It covers but is not limited to:

- lean manufacturing
- agile manufacturing
- preventative and predictive maintenance approaches
- monitoring and data gathering systems such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Manufacturing Resource Planning (MRP), and proprietary systems such as SAP
- statistical process control systems, including six sigma and three sigma
- Just in Time (JIT), kanban and other pull related manufacturing control systems
- supply, value, and demand chain monitoring and analysis
- other continuous improvement systems.

Competitive manufacturing should be interpreted so as to take into account the stage of implementation of competitive manufacturing approaches, the enterprise's size and work organisation, culture, regulatory environment and manufacturing sector.

Procedures

Procedures include 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

RANGE STATEMENT	
	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 Good Manufacturing Practice (GMP), Responsible Care) and government regulations.
Roadblocks	Includes 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.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT641A Implement a continuous improvement system

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills required to introduce and institutionalise continuous improvement (kaizen) to the organisation.

Application of the Unit

Application of the unit	This unit covers the introduction of continuous improvement as a manufacturing strategy across an enterprise. Continuous improvement strategies are sometimes also known as kaizen in different manufacturing systems. The continuous improvement (kaizen) strategy is usually undertaken through special improvement 'events' that cover the identification of improvement opportunities and the undertaking of the improvement 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 starting point for the continuous improvement program in the enterprise other relevant units may need to be selected including: • <i>MSACMT640A Manage 5S system in a manufacturing environment</i> • <i>MSACMC611A Manage people relationships</i> • <i>MSAPMSUP390A Use structured problem solving</i>

	<i>tools</i> MSACMT280A Undertake root cause analysis

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 continuous improvement (kaizen) event	1.1. Select process/area for kaizen event 1.2. Select kaizen team for event 1.3. Develop <i>scope</i> and direction for event 1.4. Validate scope with stakeholders 1.5. Determine <i>whether to proceed</i> with kaizen event 1.6. Negotiate problem issues with undertaking identified improvement, or choose a different process or area for improvement activity

ELEMENT	PERFORMANCE CRITERIA
2. Undertake kaizen event	1.7. Make infra structure and support arrangements for improvement event.
	2.1. Arrange for initial training in continuous improvement (kaizen) and related skills for employees involved in improvement event 2.2. Facilitate the development of operating protocols for the team 2.3. Build a <i>description of the target work process</i> 2.4. Clarify points of disagreement/uncertainty through consultation and where required by reference to <i>procedures</i> or other relevant <i>authority</i> 2.5. Analyse the process to quantify <i>waste</i> volumes and sources 2.6. Consult individual operators in process or area asking for improvement ideas 2.7. Solve performance issues 2.8. Negotiate any differences between problems and proposed solutions and initial objectives of improvement event 2.9. Develop plan(s) and obtain agreements to implement improvements 2.10. Implement improvements 2.11. Measure changes and calculate benefits 2.12. Complete all relevant documentation 2.13. Communicate achievements to stakeholders
3. Institutionalise continuous improvement	3.1. Arrange for additional continuous improvement (kaizen) events using different team members 3.2. Arrange for ongoing continuous improvement (kaizen) events with previous kaizen team members 3.3. Build a culture for ongoing continuous improvement (kaizen)

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

- analysis
- problem solving
- teamwork
- planning and organising
- communication
- documenting

Required knowledge

- continuous improvement (kaizen) philosophy and process

Evidence Guide**EVIDENCE GUIDE**

The evidence guide describes the underpinning knowledge and skills that must be demonstrated to prove competence. It is essential for assessment and must be read in conjunction with the performance criteria, the range statement and the assessment guidelines of the relevant training package

Overview of assessment requirements

Assessment should cover the ability to implement a continuous improvement (kaizen) strategy across a manufacturing enterprise as distinct from simply participating in kaizen events

What are the specific resource requirements for this unit?

Access to an organisation using or introducing kaizen.

In what context should assessment occur?

Assessment will need to occur in an organisation implementing a continuous improvement strategy (kaizen). Assessment should cover a sufficient period to observe the success of the continuous improvement strategy. Assessment may be by project or portfolio assessment.

Are there any other units which could or should be assessed with this unit or which relate directly to this unit?

Depending on starting point for the continuous improvement program in the enterprise other relevant units that could be assessed in conjunction with this unit include:

- *MSACMT640A Manage 5S system in a*

EVIDENCE GUIDE	
	<i>manufacturing environment</i> • <i>MSACMC611A Manage people relationships</i> • <i>MSAPMSUP390A Use structured problem solving tools</i> • <i>MSACMT280A Undertake root cause analysis</i>
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, 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?	Generally one significant kaizen event or a number of routine events, plus ongoing kaizen would be needed to generate 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.	
Scope	Scope of event may include:

RANGE STATEMENT	
	• description of the business • the target work process • what the key stakeholders seek from the kaizen event • a mission for the event • a set of goals • a statement of the do's and don'ts for the kaizen team
Whether to proceed	The decision to proceed (or otherwise) will be based on: • the focus of the kaizen event makes sense • the business case for doing the event is reasonable • the degree of support from management and employees • the setting and resources available to the event are adequate • the timing of the event will not interfere with business • specifics about the work process such as its overall operating cost and factor costs (eg labour, machine, raw materials) are available
Description of the target work process	The description of the work target process may include: • an overview that captures the purpose of the work process • essentials about the process (eg inputs, outputs, departments with which it coordinates) • a work process map that shows the sequence of operations that execute it
Procedures	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 Good Manufacturing Practice (GMP), Responsible Care) and government regulations. Procedures also include required procedures under legislation or regulation. awards and enterprise agreements.

RANGE STATEMENT	
Authority	The authority will vary according to the problem encountered and may include: • internal or external technical specialist • designated manager • equipment supplier • regulatory authority • safety specialist • reference manuals
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 • 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.
Solve performance issues	Solving performance issues includes: • generating improvement ideas (brainstorming/ask expert) • selecting most appropriate improvement ideas to proceed with • conducting experiments where required to test idea • making final selection of improvement ideas

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT650A Determine and improve process capability

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed 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

Application of the unit	In a typical scenario a person (who may be a production manager, plant/process engineer, technical specialist or similar) will be responsible for developing plans to improve process capability and following agreement the implementation of the plans to improve process capability. The organisation may use either a 6 sigma or 3 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.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	MSACMT452A	<i>Apply statistics to processes in manufacturing</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. Obtain data for process capability study	1.1. Identify the process requiring capability analysis 1.2. 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 people 2.3. Analyse random variations for possible causes in liaison with relevant people 2.4. Confirm cause/s of random variation 2.5. Develop solutions to reduce random variations in liaison with relevant people

ELEMENT	PERFORMANCE CRITERIA
3. Take action to improve process capability	3.1. Develop plans to implement solutions 3.2. Liaise with relevant people to implement solutions 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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- mathematical
- statistical methods
- communication
- negotiation
- planning
- analysis
- problem solving
- teamwork
- computer operation

Required knowledge

- 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

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 should be able to implement and review a process capability system and make improvements to the process using process capability as a tool.
What are the specific resource requirements for this unit?	Access to an organisation using process capability.
In what context should assessment occur?	Assessment needs to occur in an organisation using process capability as a tool for process monitoring and improvement. It may also be assessed using a suitable project.
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>MSACMT250A Monitor process capability</i>, and • <i>MSACMT450A Undertake process capability improvements</i> which cover the lowest and intermediate skill levels in CM respectively.
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, 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	One complex project, or several simpler projects will be

EVIDENCE GUIDE**for demonstration of consistent performance?**

needed to gain 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.

Six sigma

Six sigma is 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 manufacturing approach. Six sigma training typically covers several units of competency in this Training Package.

Three sigma

Traditional statistical process control uses three sigma limits which equates to 3 defects per thousand opportunities for each product or service transaction.

Procedures

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 Good Manufacturing Practice (GMP), Responsible Care) and government regulations.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT660A Develop the application of enterprise systems in manufacturing

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed to continuously modify and improve or develop new enterprise wide systems such as SCADA, ERP, 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

Application of the unit	This unit covers the development and implementation of new systems or modifications/changes to the current system. While the person might generate the ideas for change themselves and also undertake a significant part of the final implementation, they would 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

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 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 improved/changed information/control needs 1.4. Identify short comings in information/control provision 1.5. Take appropriate action on information/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. Communicate regularly with key stakeholders about current system use and application

ELEMENT	PERFORMANCE CRITERIA
	2.3. Identify problems/issues 2.4. Take appropriate action on problems/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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- keyboarding/mousing
- communication
- teamwork
- problem solving
- negotiation
- prioritising
- planning

REQUIRED SKILLS AND KNOWLEDGE

- analysing
- organisation

Required knowledge

- 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**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 modify an existing system to accommodate changed needs of the organisation, or make improvements to an existing system to better do what it is already doing. They could also work with relevant experts to implement a new system to an organisation, process or part of a process.
What are the specific resource requirements for this unit?	Access to an organisation operating systems and undertaking developments to its system.
In what context should assessment occur?	Assessment would need to occur in an organisation using or introducing SCADA, resource planning or similar systems or a suitable simulation.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit could be assessed concurrently with units of project management, product design or process improvement/ optimisation.
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,

EVIDENCE GUIDE	
	reliable, 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?	Where evidence is provide from small developments, a range of development activities should be considered to provide sufficient evidence. Where evidence is from one complex development project, this may 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.	
SCADA	System Control and Data Acquisition (SCADA) is a general term applied 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 manufacturing 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

RANGE STATEMENT	
	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, SAP, MRP/MRP II.
Value chain	Competitive manufacturing organisations encompass the entire production system, beginning with the customer, and includes the product sales outlet, the final assembler, product design, raw material mining and processing and all tiers of the value chain (sometimes called the supply chain). Any truly 'competitive' system is highly dependent on the demands of its customers and the reliability of its suppliers. No implementation of competitive manufacturing can reach its full potential without including the entire 'enterprise' in its planning.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT661A Determine and establish information collection requirements and processes

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills required to determine what information is needed to support decision making in a competitive manufacturing 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

Application of the unit	This unit covers the determination of data needs and collection methods for a manufacturing 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 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

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 decision to be made	1.1. Identify person/s to be included in the analysis process 1.2. Determine the consequences of the decision in liaison with relevant people 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 person/s
2. Define the factors which cause the 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

ELEMENT	PERFORMANCE CRITERIA
	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 this 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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication
- analysis
- problem solving
- negotiation
- mathematics
- teamwork
- planning and organising

Required knowledge

- business needs of the organisation/section
- information needs of individuals within the organisation
- possible data available/potentially available to the organisation
- relationship between data available and information required
- methods of converting data into useful 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, the range statement and the assessment guidelines for this training package.

Overview of assessment requirements

The person will be able to determine information and data requirements for any activity, and, in liaison with others, implement the collection of the data and distribution of the information.

What are the specific resource requirements for this unit?

Access to an organisation which makes conscious decisions about its information needs.

In what context should assessment occur?

Assessment will need to occur in an organisation which makes conscious decisions about its information needs.

Are there any other units which could or should be assessed with this unit or which relate directly to this unit?

There are no related units. Concurrent assessment may be undertaken with appropriate units.

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, 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.

EVIDENCE GUIDE

What evidence is required for demonstration of consistent performance?

Where evidence is provided from ongoing changes to the information requirements, then a range of changes will be needed to provide sufficient evidence. Where evidence is provided from a complex information requirements project, then a single project may 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.

Determining data needs

This unit is focused more 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.

Competitive manufacturing

Competitive manufacturing is used to describe the range of systemic manufacturing practice concepts and approaches. It covers but is not limited to:

- lean manufacturing
- agile manufacturing
- preventative and predictive maintenance approaches
- monitoring and data gathering systems such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Manufacturing Resource Planning (MRP), and proprietary systems such as SAP
- statistical process control systems, including six sigma and three sigma
- Just in Time (JIT), kanban and other pull related manufacturing control systems
- supply, value, and demand chain monitoring and analysis
- other continuous improvement systems.

RANGE STATEMENT	
	Competitive manufacturing should be interpreted so as to take into account the stage of implementation of competitive manufacturing approaches, the enterprise's size and work organisation, culture, regulatory environment and manufacturing sector.
Decision	This unit potentially applies to all organisations that are pursuing competitive manufacturing. A decision can be 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	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT670A Develop and manage sustainable energy practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the skills needed to identify opportunities for and make improvements in sustainable energy 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 energy 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 energy to the process. Some of this is necessary waste but typically a large part of energy use in unnecessary waste and so should be totally eliminated. In order to make these savings, there is a need to analyse energy 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 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.

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 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 1.5.
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

ELEMENT	PERFORMANCE CRITERIA
	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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- analysis
- mathematics
- communication

REQUIRED SKILLS AND KNOWLEDGE
• problem solving • data gathering • planning and organising
Required knowledge
• 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 • process needs for energy

Evidence 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 energy use of any/all part/s of the process and determine if there are more efficient/cheaper ways of achieving the same result.
What critical aspects of evidence are required to demonstrate competency in this unit?	Evidence of analyses of energy consumed and improvements made should be available.
In what context should assessment occur?	Assessment needs to be conducted in an organisation where energy is a significant cost component or by project, simulation or case study.
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>MSACMT270A Use sustainable energy practices</i> - which covers the individual application level, and • <i>MSACMT671A Develop and manage sustainable environmental practices</i> - which covers general environmental practices.

EVIDENCE GUIDE	
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, 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 energy efficiency, then it may provide sufficient evidence. If evidence is from a number of minor improvements to energy 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.	
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

RANGE STATEMENT	
	• 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.
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 (eg 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 is used to mean 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 (including pumps and conveyors), modifying materials (including cutting, forming, weaving, knitting, reacting, moulding, extruding, mixing), generating pressure/vacuum or providing motive power for equipment and transport.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

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	

MSACMT675A Facilitate the development of a new product

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the knowledge and skills required to develop a new/evolutionary product within an existing range of products and encompasses design for manufacture and the facilitation of its initial production. This unit is based on <i>PMBTECH601A Develop a new product</i>

Application of the Unit

Application of the unit	This competency applies to people who develop new products to meet a specified end use. This will involve working closely with a range of management and operations personnel and requires balancing the business and technical sides of the new product and would typically be done as part of a cross functional team. This unit of competency applies to the technical expert. Critical aspects for success include: • ensuring the technical performance meets the customer's needs • making sure the market needs of cost, timeliness and quality are appropriately balanced • designing a product and process which can be efficiently made by the company • liaising with the required people to ensure tooling design and manufacture and equipment modification is correct • optimising the process for the new product at the completion of the development phase. This competency is typically performed by high level staff, working as part of a product design, development

	and implementation team and taking a lead technical role. This unit primarily requires the application of skills associated with communication in gathering, analysing and applying information and consulting with stakeholders. Team work, problem solving, initiative and enterprise, and planning and organising are required to facilitate the development of a new product. This unit also requires aspects of self management and learning to ensure feedback and new learning is integrated into competitive manufacturing strategies. This unit of competency assumes the knowledge component included in the following unit of competency. Evidence must be available that the specified knowledge has been acquired and is able to be applied: <i>MSACMT452 Apply statistics to processes in manufacturing</i>

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	<i>MSACMT452 Apply statistics to processes in manufacturing</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 product in consultation with relevant people	1.1. Communicate with customer and other key stakeholders and agree on technical specification, aesthetic requirements, timelines, cost and other market requirements 1.2. Determine regulatory/industry code/intellectual property requirements for product 1.3. Identify possible tooling/process/equipment needs 1.4. Develop design brief, including relevant drawings, to meet needs 1.5. Obtain 'sign off' on total design brief from all relevant persons
2. Determine material requirements for product	2.1. Select appropriate materials/combination of materials/ components in liaison with key stakeholders 2.2. Determine material/component testing and evaluation regime required to meet product end use requirements, including regulatory /industry code requirements 2.3. Arrange for, testing and evaluation of trial materials/ components 2.4. Guide material trial process and interpret material trial results 2.5. Determine final materials/components specifications and details of value chain
3. Determine process requirements for product	3.1. Select appropriate process to make product in liaison with key stakeholders and based on relevant factors 3.2. Determine any special process/equipment requirements for this product 3.3. Communicate with production personnel to determine their concerns and/or training or other needs 3.4. Adjust the design as required to satisfy customer and production needs
4. Ensure process needs for	4.1. Liaise with equipment design/procurement

ELEMENT	PERFORMANCE CRITERIA
new product have been met	personnel 4.2. Interpret hardware specifications and ensure they are appropriate for the job required 4.3. Liaise with process personnel to ensure appropriate draft procedures for new product have been developed 4.4. Validate product cost and design meets objectives
5. Trial new product through the process	5.1. Design trialing procedure to deliver required information 5.2. Liaise with relevant stakeholders 5.3. Ensure health safety and environment (HSE) requirements are stringently observed 5.4. Coordinate the trialing of the new product 5.5. Interpret product trial results and guide product trial process 5.6. Tune process to optimise production of new product
6. Determine process capability	6.1. Plot appropriate statistical process control charts 6.2. Determine confidence limits 6.3. Compare confidence limits with product specification
7. Coordinate product trials	7.1. Determine product testing and evaluation regime required to meet end use requirements, including regulatory/industry code requirements 7.2. Arrange for testing and evaluation of trial product/prototype 7.3. Interpret product trial results and guide product trial process 7.4. Determine final product specification in liaison with key stakeholders 7.5. Make required changes to materials, process and equipment
8. Implement standard procedures for new product	8.1. Monitor initial production and, in liaison with appropriate team members, adjust process, conditions and materials to ensure the product and process outcomes conform to requirements 8.2. Ensure process specifications are updated and reflect the optimised operation developed 8.3. Ensure standard operating procedures are correct

ELEMENT	PERFORMANCE CRITERIA
	for the new product 8.4. Ensure equipment and other hardware records are updated to reflect additions/changes 8.5. Ensure project records are complete and all required reports have been completed and submitted 8.6. Archive records according to company procedure

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability for the practical completion of the job to:

- select and justify the selection of:
 - type of material/material specification
 - appropriate process for a range of product/market applications
 - material and product testing procedures
- apply theoretical principles to predict:
 - properties of product based on materials selected
 - effects of processes and processing on the final properties of the product
- mathematically determine:
 - product cost estimates
- interpret and make recommendations based on:
 - field test results
 - market analysis data
 - trailing data.

Required knowledge

- Knowledge and understanding of the materials, equipment and process sufficient to choose an appropriate combination of materials and process to achieve the end use function of the product.
- Knowledge of the enterprise's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Evidence Guide

EVIDENCE GUIDE The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the assessment guidelines for this training package.	
Overview of assessment requirements	There should be evidence of successfully designed products.
What are the specific resource requirements for this unit?	Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of 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.
What critical aspects of evidence are required to demonstrate competency in this unit?	The critical aspect for this unit of competency is the ability to apply a thorough understanding of materials and components, their grades and properties and the effects of processing to a new situation and use this understanding to predict likely solutions to the new product design specification challenge. This understanding of material/component and process interactions should also be able to be applied in interpreting data and making adjustments to materials/components and process to achieve the desired outcomes.
Language, literacy and numeracy requirements:	This unit requires high levels of numeracy and literacy with the ability to write and interpret technical specifications and reports. Advanced numeracy allowing the calculation and interpretation of statistics, product formulae and process conditions is also required.
In what context should assessment occur?	Competence in this unit may be assessed: • by observation of an actual product development project where the assessee takes a lead technical role • by use of a suitable product development project where arrangements are made to also assess the implementation aspects. The development must be of a product which is new to the organisation and not just a modification of an existing product. It is possible that a major redesign of an existing product may encompass all the aspects of a new product design to an

EVIDENCE GUIDE	
	appropriate breadth and depth. Where the only available product design projects are the major redesign of an existing project, normally several such projects will be required to match the breadth and depth of skills which can be demonstrated by the development of a totally new product. In all cases it is expected that practical assessment will be supported by targeted questioning to assess the underpinning knowledge and theoretical assessment will be supported by appropriate practical/simulation or similar assessment.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit may be assessed with other relevant units.
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, 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?	Evidence from one major product design or a number of product improvements should be available.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for

RANGE STATEMENT

different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Processes and policies	This competency unit is for the design of a new product 'from scratch'. It assumes an understanding of the operation of all relevant equipment and processes but does not necessarily require them to be used personally. The competency assumes a working knowledge of all main processes and materials so that an informed choice can be made between them. All operations are performed in accordance with standard procedures and policies.
Tools and equipment include	• understanding of use of all standard processing equipment • relevant personal protective equipment.
Typical regulatory requirements include:	• Occupational Health and Safety (OHS) • environmental regulations • structural codes • product/industry specific requirements.
Typical problems include:	• defining product end use requirements in terms meaningful to the product design and manufacture • matching suitable materials and processes to the product needs and company expertise and facilities • matching (and improving) process capability to product tolerances.
Relevant factors may include:	• type of material • dimensional precision of product • length of run/number of products • required aesthetics • size and complexity of product • available capital funding • process equipment available • HSE.

Unit Sector(s)

Unit Sector	CM Tools

Co-requisite units

Co-requisite units	

Functional area

Functional Area	

MSACMT681A Develop a proactive maintenance strategy

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed to develop and implement a predictive maintenance strategy for a manufacturing enterprise. The unit recognises that there are a number of predictive or proactive maintenance strategies such as TPM, RCM.

Application of the Unit

Application of the unit	In a typical scenario, an organisation engaged in competitive manufacturing also adopts proactive maintenance strategies. The initial development and implementation will need to be managed as will subsequent changes to the strategy. The unit covers the selection of appropriate strategies, techniques and tools and adopting them to the organisations needs. It also covers the 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 maintenance requirements of relevant technology. 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

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 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 <i>strategies, techniques and tools</i> 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	2.1. Select preferred maintenance strategy

ELEMENT	PERFORMANCE CRITERIA
strategies	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

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication
- teamwork
- analysis
- problem solving
- mathematics
- planning
- reading and interpreting engineering specifications/drawings
- computer use
- prioritising
- recording data

REQUIRED SKILLS AND KNOWLEDGE**Required knowledge**

- characteristics and strengths of different types of strategies, techniques and tools such as TPM, RCM, MTBF, FMEA, condition monitoring, RCA
- holistic costs of different strategies combining cost of maintenance with costs of lost production, sales etc 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**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 select appropriate strategies, techniques and tools and adapt them to the organisations needs. They will also be able to apply the strategies to new areas and improve their operation in existing areas.

What are the specific resource requirements for this unit?

Access to an organisation using, or about to use, predictive maintenance strategies.

In what context should assessment occur?

Assessment will need to occur in an organisation using, or about to use, a predictive maintenance strategy or a case study or project.

Are there any other units which could or should be assessed with this unit or which relate directly to this unit?

This unit may be assessed concurrently with other relevant maintenance units and technical units related to the techniques and tools.

This unit is related to:

- *MSACMT280A Undertake root cause analysis*
- *MSACMT281A Contribute to the application of a proactive maintenance strategy, and*
- *MSACMT481A Undertake proactive maintenance analyses*

EVIDENCE GUIDE	
	which cover different aspects/levels of this area.
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, 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 provided from the initial introduction of a predictive maintenance strategy or a significant maintenance strategy, then one development and implementation may provide sufficient evidence. Where evidence is from the ongoing improvements of an existing strategy, then it will be needed from a range of activities 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.	
Competitive	Competitive manufacturing is used to describe the range

RANGE STATEMENT	
manufacturing	of systemic manufacturing practice concepts and approaches. It covers but is not limited to: • lean manufacturing • agile manufacturing • preventative and predictive maintenance approaches • monitoring and data gathering systems such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Manufacturing Resource Planning (MRP), and proprietary systems such as SAP • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull related manufacturing control systems • supply, value, and demand chain monitoring and analysis • other continuous improvement systems. Competitive manufacturing should be interpreted so as to take into account the stage of implementation of competitive manufacturing approaches, the enterprise's size and work organisation, culture, regulatory environment and manufacturing sector.
Strategies and techniques	Total Preventative Maintenance/Total Productive Maintenance (TPM) is an application of total quality management to maintenance with the intention of increasing reliability, getting it right first time and increasing Overall Equipment Efficiency (OEE). Reliability Centred Maintenance (RCM) moves maintenance from reactive, or even planned/programmed towards a focus on uptime and OEE Root Cause Analysis (RCA). 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. 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%.

RANGE STATEMENT

Overall Equipment Efficiency (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, re-works and start up waste.

Mean Time Between Failure (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.

Failure Mode and Effects Analysis (FMEA) is a systematic approach that identifies potential failure modes in a system, product, or manufacturing/assembly operation caused by either design or manufacturing/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 HAZOP) for design and modification.

Hazard and Operability Studies (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 involves often quite sophisticated monitoring of equipment including such things as vibration monitoring, instrumental analysis of lubricating oil etc to determine the current state of the equipment, monitor the change in this condition and predict when it needs servicing/maintenance to maintain reliability.

RANGE STATEMENT**Tools**

Tools selected will vary with the selected strategy and techniques. Tools should be compatible with the strategy and techniques chosen.

This unit does not cover the use of selected tools.

Tools may include root cause analysis, condition monitoring, maintenance/breakdown history, manufacturer's recommendations

Unit Sector(s)**Unit Sector**

CM Tools

Co-requisite units**Co-requisite units****Functional area****Functional Area**

MSAENV272A Participate in environmentally sustainable work practices

Modification History

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

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).

Competency field

Competitive manufacturing tools

Licensing/Regulatory Information

Pre-Requisites

Employability Skills Information

Elements and Performance Criteria Pre-Content

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria

1 Identify current resource use.	1.1 Identify workplace environmental and resource efficiency issues.
	1.2 Identify resources used in own work role.
	1.3 Measure and record current usage of resources using appropriate techniques.
	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 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

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

Competency includes sufficient knowledge to:

have a basic understanding of sustainability

know the environmental and resource hazards/risks 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 laws and regulations to a level relevant to the work context

and the skill to

report as required by procedures

Language, literacy and numeracy requirements

This unit requires the ability to follow procedures and instructions and respond to change. Communications skills are required to enable questions and clarifications relating to work requirements.

Writing is required to the level of interpreting required procedures and completing 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.

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 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:

- identify 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.

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 demonstration in the workplace
- 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. 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 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.

Range Statement

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 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.

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.

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

efficient energy use, seeking alternative sources of energy

efficient water use

efficient use of materials and appropriate disposal of waste.

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 and regulations.

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:

documented policies and procedures

work plans to minimise waste, increase efficiency of water use etc.

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

improve energy efficiency

increase use of renewable, recyclable, reusable and recoverable resources

reduce waste

increasing the reusability/recyclability of wastes/products.

Unit Sector(s)

MSAENV472A Implement and monitor environmentally sustainable work practices

Modification History

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

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.

Competency field

Competitive manufacturing tools

Licensing/Regulatory Information

Pre-Requisites

Employability Skills Information

Elements and Performance Criteria Pre-Content

Elements and Performance Criteria

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 compliance 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.
 - 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 specialist.
 - 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

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

Competency includes sufficient knowledge to:

know how to access and use relevant environmental and resource efficiency systems and procedures

know best practice approaches relevant to own area of responsibility

know and apply strategies to maximise opportunities and minimise impacts relevant to own work area

know relevant environmental and resource efficiency issues specific to industry practices.
and the skill to

be able to access and use relevant environmental and resource efficiency systems and procedures

be able to apply quality assurance systems relevant to own work area

be able to apply relevant supply chain procedures.

Language, literacy and numeracy requirements

This unit requires communication/consultation skills to ensure information is supplied to the work group.

Writing is required to comprehend documentation and interpret environmental and energy efficiency requirements.

Numeracy is required to interpret numeric workplace information, readings and measurements, handle data as required and complete numeric components of workplace forms/reports.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the assessment guidelines for this training package.

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:

- 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.

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 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. 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 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.

Range Statement

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 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.

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.

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

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).

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

others as appropriate to the specific industry contexts.

Compliance

Compliance includes meeting relevant federal, state and local government laws, by-laws, regulations and codes of practice.

Incidents

Incidents include:

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

maximising opportunities to re use and recycle materials

identifying strategies to offset or mitigate environmental impacts. e.g. purchasing of carbon credits

expressing purchasing power through the selection of suppliers with improved environmental performance. e.g. purchasing renewable energy

eliminating the use of hazardous and toxic materials increasing the reusability/recyclability of wastes/products.

Unit Sector(s)

MSAENV672A Develop workplace policy and procedures for sustainability

Modification History

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

This competency applies to team leaders/supervisors/managers who are required to develop approaches to 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.

Competency field

Competitive manufacturing tools

Licensing/Regulatory Information

Pre-Requisites

Employability Skills Information

Elements and Performance Criteria Pre-Content

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Develop workplace	1.1 Define scope of sustainability policy.

- sustainability policy.
- 1.2 Identify and consult stakeholders as a key component of the policy development process.
 - 1.3 Include strategies for minimising resource use, reductions in toxic material and hazardous chemical use and the employment of life cycle management approaches at all stages of work in 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 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

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

Competency includes sufficient knowledge to:

know and be able to apply relevant policy development processes and practices

apply an understanding of the principles, practices and available tools and techniques of sustainability management relevant to the particular industry context

know best practice approaches relevant to own work area

be aware of equal employment opportunity, equity and diversity principles and occupational health and safety implications of policy/s being developed

and the skill to

be able to use relevant systems and procedures to aid in the achievement of sustainability in the workplace

be able to apply quality assurance systems relevant to own enterprise

be able to access and apply other relevant enterprise policies, procedures and protocols

have relevant industry competency

Language, literacy and numeracy requirements

This unit requires the ability to:

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.

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 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
- develop a workable implementation strategy
- include measurable criteria for reviewing improvement.

Consistent performance should be demonstrated. For example, look to see that:

- policy implementation is reviewed
- policy is developed to be part of the routine practices of the organisation.

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 demonstration in the workplace
- 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. 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 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.

Range Statement

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 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.

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.

Scope of sustainability policy

Scope of sustainability policy include:

An integrated approach to sustainability which includes environmental, economic and social aspects, or a narrower one to focus on each aspect individually

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

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

Strategies include:

awareness raising among stakeholders
training of staff in principles and techniques of sustainability
promotional activities.

Unit Sector(s)

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.

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 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.
	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 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 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

Not applicable.

Unit Descriptor

Unit descriptor

This unit covers the development, implementation and evaluation of a risk management plan for the organisation. It incorporates an assessment of all potential risks facing the organisation and the development of strategies and plans to mitigate all risk situations through elimination, isolation or protection.

Application of the Unit

Application of this unit

This competency applies to managers or OHS specialists who are developing or maintaining a risk management plan for their site or organisation. This unit was based on the Australian Risk Management standard AS/NZS4360, 1999 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. For general business and finance risk units refer to the Finance Training package FNB04.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has the prerequisite of *MSAOHS401A Assess risk*.

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. Develop risk management plan.	1.1 Analyse and interpret strategic position and policy on risk management. 1.2 Ensure that an audit is conducted to identify risk management context and potential areas of risk. 1.3 Analyse organisational capability to reduce/control the likelihood of both incidents and consequences. 1.4 Evaluate the risk register to ensure it contains relevant information regarding sources of risk, scenarios for loss of control of the risk, possible consequences, risk controls and action. 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 procedures for ongoing identification of hazards, and assessment and control of risk. 1.9 Consult stakeholders in the development of the plan.
2. Implement risk management plan.	2.1 Review, in consultation with stakeholders, the ranking of risks and the classifications of levels of risk. 2.2 Place on a monitor/review watch list risks classified as low/acceptable. 2.3 Implement processes to eliminate wherever practicable risks that are unacceptable.

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.
	2.4 Implement processes to mitigate/minimise risks that cannot be eliminated in accordance with the risk management plan and the hierarchy of control. 2.5 Document strategies for risk minimisation.
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 describes the essential skills and knowledge and their level required for this unit.

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:

- 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
- 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 OHS and environmental management
- internal or external audit methods
- focus groups processes
- hazard analysis processes
- investigation reports
- review of data such as hazard and incident reports, maintenance records, production records.

Language, literacy and numeracy requirements

This unit requires the ability to communicate high level material using all modes of communication to all levels.

Writing is required to the level of writing reports, policies and procedures.

Numeracy 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 *MSAOHS401A Assess risk*, 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:

- develop, implement and evaluate the development of plans to eliminate
- isolate or protect people (and/or equipment) in the event of the potential negative event occurring.

The emphasis should be on the ability to avoid/eliminate critical incidents rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look for:

- communication/consultation skills to ensure all relevant groups and individuals are briefed, consulted and have an opportunity to input
- negotiation skills to mediate, negotiate to obtain consensus between individuals/groups on the risk management plan and (where required and appropriate) categorisation of risks
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities
- ability to apply a systematic process to development and documentation of plan and implementation of actions.

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 (eg HAZOP) and similar sources.

Assessment method and context

Assessment will occur in 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

Persons and organisations engaged in assessing managers in this unit need to have appropriate qualifications and experience in risk management as well as workplace assessment.

Risk management is the systematic process that is directed towards identifying hazards, assessing the risk and developing controls to minimise the risk and monitor the effectiveness of the controls (and taking action as required).

Relevant groups and individuals refers to those personnel who have knowledge about the issue being dealt with and the expertise to assist the decision making process.

External specialist assistance refers 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.

Risks

Risks may include:

- injury or disease
- environmental
- 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.

Legislation etc

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 OHS, environmental issues, EEO, industrial relations and anti-discrimination
- relevant industry codes of practice.

Risk ranking

Risk ranking is a highly subjective process of rating risks according to their severity and likelihood. Common ranking systems are based on matrices or nomograms.

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.

Unit Sector(s)

Not applicable.

MSAPMOPS100A Use equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit covers the use of any item of equipment which is operated with limited application of knowledge.

Application of the Unit

Application of this unit

This competency applies to operators at the entry level who operate equipment without significant understanding of the equipment or process, and to all operators who operate 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, use high speed compressors and computerised monitoring and control equipment, the operator interface is relatively simple.

This competency includes:

- following procedures
- turning the equipment on and off when appropriate
- recognising common problems and reporting them, or performing an emergency shutdown as appropriate
- working within appropriate codes and regulations.

Where greater levels of understanding and interaction are required, then the appropriate 200 series unit should be used.

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. 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 (eg 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

RANGE STATEMENT

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 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
- 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 means 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.

MSAPMOPS101A Make measurements

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit covers the making or taking of measurements in a variety of sites and locations.

Application of the Unit

Application of this unit

This unit applies to people who are required to apply basic knowledge and skills in performing routine measurements for industry related operations. It is typically performed by people working either independently or as part of a work team.

The worker will:

- make measurements using physical and/or chemical measuring equipment
- record results using either a manual or computer system
- identify problems and take required action
- 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 appropriate measurements.	1.1 Select appropriate measuring equipment. 1.2 Identify units to be used, and the detail required. 1.3 Check measuring equipment is in calibration.
2. Perform measurements	2.1 Explain range of results that may be obtained 2.2 Identify and take account of relevant external factors. 2.3 Perform measurements using appropriate techniques 2.4 Compare measurements against the range of expected results 2.5 Self-check numerical information for accuracy and correctness. 2.6 Explain the need for calibration and use calibrated equipment to make measurements.
3. Record measurements as required.	3.1 Accurately record the result in the appropriate format. 3.2 Record the result to the appropriate level of detail.
4. Respond to routine problems in accordance with procedures	4.1 Recognise known faults that occur during the measurement. 4.2 Identify and take action on causes of routine faults. 4.3 Log problems as required. 4.4 Identify non-routine problems and report to

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	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 non-standard situations and then determine appropriate action which is consistent with operating guidelines. For example, in gel coating, a coating less than 5 mils thick may wrinkle, especially when brush marks are present. Thickness is checked using a gel coat thickness gauge.

Knowledge and the ability to implement the organisation's procedures and relevant regulatory requirements, within appropriate time constraints and work standards.

Application of approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge in measurement sufficient for consistent performance to specifications including:

- basic units of measurement (eg kilogram, metre, second)
- correct selection and use of measuring devices
- application of relevant mathematical calculations and procedures, including additions, subtractions, division, fractions, percentages
- use of dial, scale and digital readouts
- the need for calibration and methods of checking equipment is within calibration.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided.

Writing is required to the level of completing workplace forms.

Numeracy is required to the level of basic arithmetical manipulations and the interpretation of the significance of numbers and variations of 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 knowledge and skills defined in this unit. These may include the ability to

- take accurate measures using the appropriate measuring device
- apply approved procedures.

Consistent performance should be demonstrated. For example, look to see that

- standards in taking measurements are met consistently
- all safety procedures are followed.

Assessment method and context

Assessment will occur over a range of situations requiring the taking of measurements and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by observation or questioning to indicate understanding and knowledge
- 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 routine measurements within a manufacturing environment.

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:

- measuring devices, including gauges, dip-sticks, thermometers, weighing scales, length/thickness measuring
- calculators
- computers for recording results
- relevant personal protective equipment.

Hazards

Typical hazards include:

- dusts/vapour
- temperature
- hazardous substances
- manual handling hazards.

Problems

Respond to routine problems means 'apply known solutions to a limited range of predictable problems'.

Typical problems may include:

- measuring instrument not fit for use (eg not within calibration)
- appropriate measuring device not available
- deviations from normal range of readings
- effect of temperature on material properties.

Appropriate action for non-routine problems may be reporting to designated person or other action specified in the procedures.

Variables

Key variables to be monitored include:

- extent
- dimension
- quantity
- mass
- capacity
- capability.
-

Unit Sector(s)

Not applicable.

MSAPMOPS200A Operate equipment

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the operation of equipment and the resolving of routine problems to procedure in the production process. This competency is for organisation specific equipment items which are not otherwise covered in this Training Package.

Application of the Unit

Application of this unit

This competency applies to operators who are required to undertake the routine operation of equipment in the production process. The key factors are the making of products to meet quality standards and workplace requirements. This competency is typically performed by operators working either independently or as part of a work team. It includes:

- checking job sheets for work requirements
- following approved hazard minimisation procedures for any hazards connected with materials and process, using work instructions, labels and materials safety data sheets, and in accordance with OHS legislative responsibilities
- monitoring equipment operation and reporting process variations checking product for quality and conformity to specifications discarding non-conforming products ensuring discarded materials are reused where possible and waste and scrap is disposed of in accordance with workplace instructions
- identifying and taking action on routine process problems
- completing logs and reports.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. 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 prestart checks. 2.2 Start up item of equipment
3. Operate equipment to	3.1 Check equipment is operating within 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.
procedures.	limits. 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 process equipment and components
- production 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 cleanup; 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, 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.

Assessment will occur on an industrial example of the equipment 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:

- recognise the importance of material properties and qualities
- apply approved procedures
- take appropriate action to resolve faults or report faults to appropriate personnel
- explain and implement emergency shutdown 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 (ie 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

RANGE STATEMENT

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 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.

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.
-

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.

MSAPMPER200B Work in accordance with an issued permit

Modification History

Not applicable.

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 *MSAPMPER205B Enter confined space* is also required. The safety observer (standby person) competencies are covered by *MSAPMPER202A Observe permit work*. The issuing of permits is covered by *MSAPMPER300B Issue work permits*.

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

Not applicable.

Employability Skills Information

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 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. Ensure compliance with scope, location and timeframe specified in the permit or seek re-authorisation as required

	4.4.Suspend job and make work site safe before leaving job. 4.5.Formally seek and receive authorised extensions to the permit when required. 4.6.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

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

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 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

Context of and specific resources for assessment

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.

A holistic approach should be taken to the 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. 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 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 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 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 confined space is covered by <i>PMPPER205B Enter confined space</i>. The Australian Standard (AS2865) definition given for 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 • clothing • respirators and masks • 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.
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)	<i>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.</i>

Unit Sector(s)

HSE

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

MSAPMPER205B Enter confined space

Modification History

Unit Descriptor

This competency covers the control of 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 AS2865/2001, or its authorised update or replacement.

Application of the Unit

This competency applies to persons who are required to enter confined space, for maintenance purposes, for cleaning or simply inspection. It is required by all persons who are required to enter a confined space, as defined by the standard AS2865/2001, or its authorised update or replacement. It is expected that all standby persons will also be competent to enter confined space.

The issuing of confined space permits is covered by MSAPMPER300B Issue work permits.

This unit includes:

- preparing to enter the confined space
- checking the preparations against the permit conditions
- entering the confined space.

Competency Field

Licensing/Regulatory Information

Pre-Requisites

Employability Skills Information

Elements and Performance Criteria Pre-Content

Elements and Performance Criteria

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 Ensure a risk assessment associated with entry of the confined space is conducted and documented. 1.4 Identify and document relevant controls. 1.5 Make confined space ready for entry in compliance with procedures, relevant legislation and AS2865. 1.6 Confirm and verify that the conditions of the permit reflect the risk assessment.
2 Use safety equipment and PPE	2.1 Select and erect required protective equipment, apparatus and signs as defined in the confined space entry permit requirements. 2.2 Select, fit and wear designated personal protective clothing and equipment, including lifelines and harnesses as defined in the confined space entry permit requirements. 2.3 Select, test and use appropriate instruments and monitors for pre entry testing and continuous monitoring of the confined space atmosphere.
3 Control confined space entry	3.1 Ensure designated work complies with confined space permit requirements.

- 3.2 Arrange re authorisation/reissue of permit where there is any change to work undertaken.
 - 3.3 Complete confined space entry logs, ensuring that all entry and re entry of persons working within the confined space are accurately recorded.
 - 3.4 Maintain communications with all relevant personnel to ensure safety.
 - 3.5 Raise the alarm if a rescue needs to be attempted.
- 4 Conclude confined space operations
 - 4.1 Recover, clean, service and store equipment according to procedures and manufacturer guidelines.
 - 4.2 Complete appropriate documentation, including withdrawal of permits and records related to use and servicing of equipment.
 - 4.3 Report any issues, including signs and symptoms of operational stress, equipment malfunctions.

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)

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

identify new hazards and so the required hazard controls and obtain revalidation of permit
the impact of the regulatory framework and organisation procedures under which the permit

operates upon the particular job(s) requiring the permit.

Demonstration of competence in this unit must include knowledge of the following:

definition of confined space/ability to recognise a confined space and the identification of confined spaces in their workplace

hazards associated with confined space entry

hazard identification and risk assessment processes relevant to confined space work

the site/organisation specific incident response and rescue requirements

the permit to work system and the limitations and conditions of the issued permit and authorisation requirements.

Language, literacy and numeracy requirements

This unit requires the ability to:

read and correctly interpret complex P&IDs as 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 reports.

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 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:

OHS

EPA

OHS authorities and ASCC/NOHSC

licence requirements

company policy and permit control systems

other relevant standards.

Knowledge of and the application to the job of relevant legislation and AS2865/2001, or its authorised update or replacement, is essential. Australian Standard HB 213-2003 Guidelines

for Safe Working in Confined Spaces is also a useful reference.

Knowledge of the organisation's confined space procedures is required.

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. A holistic approach should be taken to the assessment.

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.

Assessment will ensure that the confined space entry procedures and documentation are known and able to be applied to a confined space entry.

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.

As working in a confined space is inherently hazardous it is essential that the worker be able to demonstrate:

the ability work within a confined space

compliance with the permit conditions

the testing and use of the approved breathing apparatus supplied by the organisation

identification of problems as they arise

the ability to take appropriate action to

resolve faults/problems or report faults/problems to appropriate personnel

ability to apply knowledge of the legislation, relevant standards and site/organisation risk assessment guidelines for confined spaces

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.

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.

Context of and specific resources for assessment

Competence in this unit may be assessed:

- by using a suitable simulation based on an 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.

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.

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 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

The Australian standard (AS2865) definition given for confined space entry is used in this Training Package, i.e.:

an enclosed or partially enclosed space which -

- a. is at atmospheric pressure during occupancy**
- b. is not intended or designed primarily as a place of work**
- c. may have restricted means for entry and exit, and**
- d. may -**
 - (i) have an atmosphere which contains potentially harmful levels of contaminant**
 - (ii) not have a safe oxygen level or**
 - (iii) cause engulfment.**

A confined space is determined in part by the hazards associated with a defined set of circumstances (restricted entry or hazardous atmosphere, risk of engulfment) and not just with work performed in a restricted space. In this Training Package work in a 'tight spot' which is not a confined space as defined has been referred to as a 'restricted space'.

Examples of confined space include (but are not restricted to):

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).

A person is deemed to have entered a confined space when their head (i.e. the breathing zone) or upper part of the body is within the boundary of the confined space. (Note that inserting an arm for atmospheric testing is not considered an entry to a confined space).

Risk assessment is required prior to entry to a confined space. The risk assessment checklists may be derived from a standard or code of practice developed by the organisation to meet relevant legislation and standards. The outcomes of the risk assessment should be documented and retained.

Preparation for entry to a confined space will be in accordance with AS2865, or its authorised update or replacement, and local procedures and may include as appropriate:

draining

blanking/blinding of lines

double block and bleed of lines

removal of spool piece

immobilisation of any moving devices

depressuring

venting/purging (to a safe area)

atmospheric testing and monitoring

other requirements as determined by risk assessment and appropriate to the confined space as required by legislation or AS2865.

Safety equipment may include:

respiratory protective devices

self contained breathing apparatus (SCBA)
long distance breathers
lifting and lowering devices, safety belts,
harnesses and lines
safety footwear
gloves
coveralls
intrinsically safe torches
hearing protection
eye protection
head protection
portable gas detectors and monitors
intrinsically safe communication equipment
incident response equipment including
rescue, First Aid, and fire suppression
spill kits.

Confined space permit should include details of:

location, description and duration of work to be done

hazards that may be encountered

atmospheric test and monitoring
requirements and results

authorisation

isolation, lock out, tag out processes

personal protective equipment and clothing

other precautions (e.g. signs, barricades)

size of work crew

stand-by personnel and emergency response
and rescue arrangements

other requirements as determined by risk
assessment and in accordance with
legislative requirements and relevant
Australian Standard including Appendix H
of AS 2865

A 'competent person' is a person who has,
through a combination of training, education

and experience, acquired and skills enabling that person to correctly perform a specified task.

Checks to ensure a workplace is safe include:
mechanical and electrical isolations in place
atmospheric testing complete and
atmosphere safe
process isolations complete
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 or if 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 safety equipment and tools such as:

eye protection (e.g. goggles)

ear protection

gloves
clothing
respirators and masks - breathing apparatus
helmets
safety footwear
lines and harnesses
gas test meters.

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
high/low oxygen content
hazardous atmospheres
entrapment/engulfment.

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/need for additional permits
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
variation in job scope from that specified in the permit.

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

persons in the confined space/rotation of
people in confined space.

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)

empty

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	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. 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.

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 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.
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.

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.

MSAPMSUP230A Monitor process operations

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the use of production processing equipment.

This competency is typically performed 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 operators who use production processing equipment. Work involves the removal of products from equipment in strict conformity with standard operating procedures and routine quality inspection processes. The key factors are the successful operation of the equipment and the ability to recognise when the process is not working as intended. It includes:

- checking job sheets for work to be done and identifying the priority in which jobs/product will be made/completed
- discussing work progress with other workers
- following approved hazard minimisation procedures for any hazards connected with materials and process, using work instructions, labels and materials safety data sheets, and in accordance with occupational health and safety (OHS) legislative responsibilities
- identifying production problems
- collecting and observing products from the production process
- collecting and disposing of waste materials
- checking materials to ensure no contamination
- identifying and taking action on routine process problems.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This 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 equipment controls and procedures.	1.1 Identify work requirements from workplace approved operating procedures. 1.2 Check operating procedures and controls to identify approved adjustments and operating parameters. 1.3 Establish actions to be used in the event of faulty production from operating procedures. 1.4 Identify procedures for obtaining materials for the process. 1.5 Identify hazards and environmental issue that might surround the operation.
2. Get ready for work/job.	2.1 Assemble ancillary tools and equipment. 2.2 Identify inspection procedures. 2.3 Identify any finishing activities. 2.4 Plan to avoid any hazards connected with materials and process by observation of the equipment, workplace

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.
	reference materials, including materials safety data sheets and equipment instructions. 2.5 Take appropriate measures to minimise risks from the identified hazards. 2.6 Establish the location and function of equipment emergency stops and ensure guards are in place. 2.7 Identify and note requirements for checking: - materials inputs and outputs - ancillary supplies and equipment - product quality requirements for the relevant process stage(s). 2.8 Obtain or arrange access to any required supplementary equipment for product quality testing or routine lubrication and adjustment.
3. Maintain operations.	3.1 Check process operations, noting product quality, production outputs and waste, in accordance with workplace practices. 3.2 Collect product outputs, check for conformity, make adjustments to the equipment (where appropriate) and store product. 3.3 Collect material which is able to be reprocessed and reused, and deal with waste and scrap in accordance with workplace procedures (where applicable). 3.4 Check readouts against standard statistical process information and enter production data into the control system. 3.5 Clean up equipment and work area and manage waste in accordance with workplace procedures.
4. Identify product quality requirements.	4.1 Monitor process and note conditions which may affect product quality standards. 4.2 Report process variations within workplace procedures. 4.3 Note and implement authorised changes in standard operating procedures and specifications.

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.

Competence includes the ability for the practical completion of the job to:

- apply and/or explain:
 - impact of incorrect or faulty materials
 - production workflow sequences and materials demand
 - focus of operation of work systems and equipment
 - correct selection and use of equipment, materials, processes and procedures
 - hazards of the materials and process and appropriate hazard control procedures
- distinguish between causes of faults such as:
 - wrong raw materials/additives
 - incorrect quantity of materials/additives
 - contaminated materials/additives
 - product variations from specification.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, eg to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria, 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:

- understand the importance of critical material properties and quantities
- recognise potential situations requiring action and implement appropriate action.

Consistent performance should be demonstrated. In particular look to see that production standards are met consistently.

Assessment method and context

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 that the theoretical assessment will be combined with appropriate practical/simulation or similar assessment.

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.

Range Statement

RANGE STATEMENT

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.

General context

This competency applies to the operation of various forms of production equipment in all work environments and sectors within the process manufacturing industry. It includes the operation of all relevant additional equipment.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Equipment and tools

This competency includes equipment and tools such as:

- hand carts and trolleys
- knives and other bag opening equipment
- hoists/lifting equipment not requiring any special permits or licences
- basic hand tools required for opening of material packaging
- relevant personal protective equipment.

Hazards

Typical hazards include:

- automated or rotating equipment
- dusts/vapours
- hazardous materials
- manual handling hazards
- knife hazards.

'Rectify routine problems' means 'apply known solutions to a limited range of predictable problems'.

Typical process problems include:

- equipment malfunctions
- product jamming or sticking
- power failures
- air, oil or lubricant difficulties.

Typical product problems include:

- variations in materials
- contamination of materials
- malformed or incomplete products.

All operations are performed in accordance with 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.

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

Not applicable.

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

Prerequisites

This unit has the prerequisite of *MSAPMSUP200A Implement production efficiencies*.

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.

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.

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.

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.

MSL916005A Manage complex projects

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to interpret complex technical briefs, determine project methodologies and resource requirements, establish project plans, manage projects to successful conclusions and evaluate project outcomes.

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. 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. Interpret brief and design feasible project plan	1.1. Interpret and confirm project objectives, deliverables, constraints and principal work activities 1.2. Determine resource requirements, including personnel, equipment and materials 1.3. Develop a detailed implementation plan for the project outlining methodology, milestones and budget 1.4. Identify roles and responsibilities of project team members 1.5. Analyse quality requirements to ensure compliance with quality standards 1.6. Develop risk management strategies and risk management plans to ensure successful and timely outcomes
2. Establish and implement project plan	2.1. Brief team members about the project and allocate roles and responsibilities, balancing job roles and skills development opportunities 2.2. Establish communication and reporting mechanisms 2.3. Implement agreed time management strategies to ensure milestones are met 2.4. Apply agreed quality requirements to measure

ELEMENT	PERFORMANCE CRITERIA
	performance and outcomes
3. Manage project	3.1. Monitor and report progress of activities in relation to the project plan 3.2. Ensure income and expenditure is in line with the agreed project plan and budget 3.3. Work with the team to analyse and diagnose problems and to determine corrective actions 3.4. Implement agreed variations to the plan to accommodate changing situations 3.5. Maintain accurate records and communication with stakeholders and project team members
4. Finalise project	4.1. Ensure project objectives are met and deliverables are provided on time and within budget 4.2. Complete all reporting requirements
5. Evaluate project methodology	5.1. Assess the effectiveness of resource management in delivering project outcomes 5.2. Evaluate the effectiveness of communication processes used throughout the project 5.3. Recommend improvements for future projects

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- analysing a complex technical brief and preparing a feasible project implementation plan
- establishing a project team and implementing a project in response
- reaching milestones within budget
- consulting and communicating effectively to ensure the project outcomes are achieved
- maintaining accurate records and documentation in accordance with the enterprise procedures
- selecting and establishing operational systems for the project
- planning work activities, resources and finances to ensure the project outcomes are

REQUIRED SKILLS AND KNOWLEDGE

- achieved within the timeframe and budget constraints
- monitoring and evaluating the progress of the project

Required knowledge

Required knowledge includes:

- purpose and methods of planning
- techniques for monitoring timelines, expenditure and team performance
- techniques for achieving effective communication and cooperation
- techniques for troubleshooting, problem solving and conflict resolution
- reporting requirements
- techniques for evaluation and continuous improvements
- relevant health, safety and environment requirements
- laboratory's business goals and key performance indicators

Evidence 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:

- analyse a complex technical brief and prepare a feasible project implementation plan
- establish a project team and implement a project in response
- reach milestones within budget
- consult and communicate effectively to ensure project outcomes are achieved
- maintain accurate records and documentation in accordance with enterprise procedures
- select and establish operational systems for the project
- plan work activities, resources and finances to ensure project outcomes are achieved within the timeframe and budget constraints
- monitor and evaluate the progress of the project.

EVIDENCE GUIDE**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:

- *MSL916002A Manage and develop teams*
- *MSL936001A Maintain quality system and continuous improvement processes within work/functional area.*

Resources may include:

- procedures and documentation typically used by the enterprise
- scheduling charts/strategic plans
- GANTT charts
- operational reports
- financial plans
- sample budgets.

Method of assessment

The following assessment methods are suggested:

- review of reports, operational budgets and project plans generated by the candidate
- review of project outcomes and customer satisfaction
- questioning/interview to assess underpinning knowledge
- feedback from project team and management
- review of documented examples of quality performance improvements achieved and examples of significant problems solved
- observation of the candidate's interaction with project team.

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

EVIDENCE GUIDE

	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 A cosmetics manufacturing company decided to upgrade the image of a product range which included lipsticks, nail lacquers, hair shampoos and conditioners. A technical specialist coordinated the project and organised input from marketing, development, quality assurance and production personnel. The production boundaries were defined through consultation with marketing and it was decided to update shades of shaded products and introduce natural ingredients wherever possible. The project had to be completed within a reasonably short timeframe and within a tight budget which placed overall constraints on the way the project could be handled. After developing and gaining approval for an implementation plan, team members were briefed and development samples produced for approval. Product characteristics were checked and recommendations made for adjustments until each product met requirements. When pilot batch manufacture had been successfully completed, project development processes were fully documented and then passed to production to allow for efficient development of production batches. Environmental The quality team in a laboratory has set a goal of getting reports out more quickly and assigned the coordination of the project to one of the senior technical officers. The officer prepared an outline of the project, a timeframe, a resource list and budget. Specific tasks were allocated to members of the quality team according to their abilities and existing work commitments. The officer monitored the project's progress by tracking and adjusting elements as necessary. After the development of a final draft for the revised procedures, a draft project report was prepared for consideration by the quality team. Food processing A dairy company currently uses an imported cocoa-based product for the chocolate flavouring of their milk. Following a feasibility study of a range of ingredients, it

EVIDENCE GUIDE

	was decided to investigate further an alternative source on the basis of cost. A technical specialist prepared a project plan that included required personnel, materials, equipment and a detailed GANTT chart. Key personnel from quality assurance, production, engineering, product development and marketing were chosen for the project team. The project was monitored to confirm progress, control expenditure and review the suitability of the alternative product source. At the end of the project, the technical specialist assessed the outcomes and prepared a detailed report that recommended the use of a local ingredient.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. 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

Complex projects

Complex projects may include:

- development or modification of products and services
- acquisition and commissioning of new equipment
- commissioning of laboratory facilities
- appraisal of supplies
- development of applications for customers
- validation of analytical methods and/or equipment
- quality improvement or corrective action teams
- restructuring of laboratory services
- reclassification of staff and staffing levels

RANGE STATEMENT	
Records	Records may include: • lists of potential costs, invoices and payment records • project and/or enterprise files and records • reports to clients, personnel and higher management • risk management plans and log books • diaries, scheduling charts and other charts
Communication	Communication may include: • computer generated communication • customers, stakeholders, external authorities and project team • reports, briefs, minutes, letters, oral briefings, advice and conversations and telephone calls
Resources	Resources may include: • personnel • budget • equipment, materials and facilities • computer project planning programs
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	Communication/organisation

Competency field

Competency field	

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		

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

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	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		

MSL974005A Perform physical tests

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the ability to interpret physical test requirements, prepare samples, conduct pre-use and calibration checks on equipment and perform routine physical tests. These tests will involve several measurement steps. The unit includes data processing and interpretation of results and tracking of obvious test malfunctions where the procedure is standardised. However, personnel are not required to analyse data, optimise tests/procedures for specific samples or troubleshoot equipment problems where the solution is not apparent.

Application of the Unit

Application of the unit	This unit of competency is applicable to laboratory or technical assistants and instrument operators working in the manufacturing, environment, food and construction materials testing 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. Interpret and schedule test requirements	1.1. Review test request to identify samples to be tested, test method and equipment/instruments involved 1.2. Identify hazards and enterprise control measures associated with the sample, preparation/test methods and/or equipment 1.3. Plan work sequences to optimise throughput of multiple samples, if appropriate
2. Receive and prepare samples	2.1. Log samples using standard operating procedures (SOPs) 2.2. Record sample description, compare with specification and note and report discrepancies 2.3. Prepare samples and standards in accordance with physical testing requirements 2.4. Ensure traceability of samples from receipt to

ELEMENT	PERFORMANCE CRITERIA
	reporting of results
3. Check equipment before use	3.1. Set up equipment/instruments in accordance with test method requirements 3.2. Perform pre-use and safety checks in accordance with relevant enterprise and operating procedures 3.3. Identify faulty or unsafe components and equipment and report to appropriate personnel 3.4. Check equipment calibration using specified procedures, if applicable 3.5. Quarantine out of calibration equipment/instruments
4. Test samples to determine physical properties	4.1. Operate equipment/instruments in accordance with test method requirements 4.2. Perform tests/procedures on all samples and standards, if appropriate, in accordance with specified methods 4.3. Shut down equipment/instruments in accordance with operating procedures
5. Process and interpret data	5.1. Record test data noting atypical observations 5.2. Ensure calculated values are consistent with expectations 5.3. Estimate and document uncertainty of measurement in accordance with enterprise procedures, if required 5.4. Record and report results in accordance with enterprise procedures 5.5. Interpret trends in data and/or results and report out of specification or atypical results promptly to appropriate personnel 5.6. Determine if obvious procedure or equipment problems have led to atypical data or results
6. Maintain a safe work environment	6.1. Use established safe work practices and personal protective equipment to ensure personal safety and that of other laboratory personnel 6.2. Minimise the generation of wastes and environmental impacts 6.3. Ensure the safe collection of laboratory and hazardous waste for subsequent disposal 6.4. Care for and store equipment and materials as required
7. Maintain laboratory records	7.1. Enter approved data into laboratory information management system

ELEMENT	PERFORMANCE CRITERIA
	7.2.Maintain confidentiality and security of enterprise information and laboratory data 7.3.Maintain equipment and calibration logs 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:

- using instruments for qualitative and/or quantitative analysis
- interpreting test methods and procedures
- sample preparation procedures
- performing calibration checks
- metrology techniques underpinning test/procedure including estimating uncertainty
- using instruments for qualitative and/or quantitative analysis
- maintaining and evaluating reagents
- troubleshooting basic equipment/method
- preparing calibration graphs and calculating results using appropriate units and precision
- applying theoretical knowledge to interpret gross features of data and make relevant conclusions such as identifying atypical results as out of normal range or an artefact
- tracing and sourcing obvious causes of an artefact
- recording and communicating results in accordance with enterprise procedures
- maintaining security, integrity, traceability of samples, sub-samples, test data, results and documentation

Required knowledge

Required knowledge includes:

- physical principles and concepts underpinning the test/procedure
- purpose of tests
- function of key components of the equipment/instrument
- effects on test of modifying equipment/instrument variables
- sample preparation procedures
- concepts of metrology

REQUIRED SKILLS AND KNOWLEDGE

- basic equipment/method troubleshooting procedures
- enterprise and/or legal traceability 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:

- interpret test methods/procedures accurately
- prepare and test samples in accordance with specified methods
- perform calibration checks (if required)
- safely operate test equipment/instruments to enterprise standards and/or manufacturer's specifications
- apply basic knowledge of physical properties of materials to interpret gross features of data and make relevant conclusions
- identify atypical results, such as out of normal range or an artefact
- trace and source obvious causes of an artefact
- communicate problems to a supervisor or outside service technician
- calculate, record and communicate results in accordance with enterprise procedures
- maintain security, integrity and traceability of samples, sub-samples, test 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:

- *MSL924001A Process and interpret data.*

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	Resources may include: • standard laboratory equipped with appropriate test equipment/instruments, standards and materials • enterprise procedures and standard methods.
Method of assessment	The following assessment methods are suggested: • review of test data/results obtained by the candidate over a period of time to check accuracy, consistency and timeliness of results • review of test records and workplace documentation completed by the candidate • observation of candidate conducting a range of physical tests and procedures and sample preparation • feedback from peers and supervisors • oral or written questioning of physical principles and concepts, test methods and enterprise 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 A technical assistant was measuring the specific density of a shipment of glycerol using a standard laboratory procedure. The result did not agree with the manufacturer's certificate of analysis. The assistant notified the manufacturer who came to the plant and checked the delivered material. It had been raining while

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	the glycerol was in transit and rain water had entered the drum, diluting the glycerol. The drum was returned to the manufacturer and a new drum was supplied to the manufacturing plant. The manufacturer investigated the seals on the glycerol drums and took action to ensure that new seals would protect the product in transit. Food processing A technician was testing the melt flow index of a new type of polymer that was to be used as a sealant for packages of freeze dried coffee. The technician measured the melt flow rate and found it was much too high. The technician then checked the melt flow equipment as per the manufacturer's directions and found the machine was out of calibration. After recalibration using recommended standards, another sample was obtained and retested. This time, the polymer was within specification and was released for use in production.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. 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

RANGE STATEMENT	
	laboratories set • AS/NZS ISO 9000 Set:2008 Quality management systems set • Australian code of good manufacturing practice for medicinal products (GMP) • calibration and maintenance schedules • data quality procedures • enterprise recording and reporting procedures • equipment startup, operation and shutdown procedures • material safety data sheets (MSDS) • material, production and product specifications • national measurement regulations and guidelines • principles of good laboratory practice (GLP) • production and laboratory schedules • quality manuals, equipment and procedures manuals • SOPs
Physical principles and concepts underpinning the test/procedure	Physical principles and concepts underpinning the test/procedure may include: • matter, interatomic and intermolecular forces and states of matter • mass, weight, forces, pressure, energy, friction and slip resistance • properties of gases, pressure/volume/temperature, density, diffusion and compressibility • cohesive/adhesive forces, hydrostatic pressure, fluid flow, viscosity and friction • thermal expansion, thermal conductivity and coefficients of expansion • changes of state, energy content, enthalpy change and endothermic and exothermic processes • electromagnetic spectrum, primary/secondary colours, reflection, refraction diffraction and interference of light • electrical concepts, including electric field, voltage, current, resistance and AC/DC • electromagnetic concepts, including magnetic field and flux, and electromagnetic induction

RANGE STATEMENT	
	• sound concepts, including wave properties, amplitude, frequency and loudness (dB) • elasticity, hardness, strength of materials, plasticity, permeability and dispersion • electrical safety concepts including voltage, current, resistance, conductors/insulators and AC/DC
Preparation of samples	Preparation of samples may include processes, such as: • drying, washing, grinding, sieving, melting and moisture conditioning • cutting, trimming or machining of test specimens, etching
Physical tests and procedures	Physical tests and procedures may include: • precise measurement of position, orientation and dimensions: • three-dimensional setup of manufacturing tools using inclinometers, verniers and laser • thickness using vernier, X-ray and gamma ray • particle size using sieving and laser • dimensional stability involving expansion, contraction and weathering • movement using strain gauge and accelerometer • mass, density and specific gravity: • moisture/density relationship • compaction • loose and compacted density • thermal tests: • thermal conductivity • coefficients of expansion (e.g. linear and volume) • melt flow index • calorimetry, (e.g. specific heat and latent heat) • combustion properties (e.g. enthalpy and energy content) • drying times • thermal stability of products

RANGE STATEMENT	
	• optical tests: • flatness and surface finish • refractive index • optical rotation • transmission/absorption of filters • colour matching of products • acoustic tests: • absorption, reflection and transmission • intensity, attenuation and loudness (dB) • amplitude and frequency • electrical tests: • conductance, resistance and insulation • temperature dependence of dielectrics • magnetic tests: • permeability • retentivity, hysteresis loss and coercivity • intrinsic induction
Test and sample preparation equipment/materials	Test and sample preparation equipment/materials may include: • crushers, mulchers, grinders, mills, riffles and sieves • moulds, bags and containers • ovens, microwaves and water baths • mass balances • microscopes • dimension apparatus (e.g. calipers and micrometer) • rammers, compression rigs and load cells • chemical reagents and volumetric glassware • temperature measuring devices, such as thermometers and thermocouples • pH and conductivity meters • analogue and digital meters, charts/recorders, data loggers and computers
Tests	Tests may include methods for: • control of starting materials, in-process materials and finished products • investigation of sources of construction materials

RANGE STATEMENT	
	• basic troubleshooting of enterprise processes
Hazards	Hazards may include: • microbiological organisms and agents, associated with soil, air and water • chemicals, such as acids and solvents • radiation, such as alpha, beta, gamma, X-ray and neutron • sharps, broken glassware and hand tools • flammable liquids and gases • cryogenics, such as dry ice and liquid nitrogen • fluids under pressure, such as steam and industrial gases • sources of ignition • burners and ovens • disturbance or interruption of services • crushing, entanglement and cuts associated with moving machinery (grinders)
Hazard control measures	Hazard control measures may include: • ensuring access to service shut-off points • recognising and observing hazard warnings and safety signs • labelling of samples and hazardous materials • handling and storage of hazardous materials and equipment in accordance with labelling, MSDS and manufacturer's instructions • identifying and reporting operating problems or equipment malfunctions • cleaning equipment and work areas regularly using enterprise procedures • using personal protective clothing and equipment, such as gloves, safety glasses, coveralls and safety boots • following established manual handling procedures • reporting abnormal emissions, discharges and airborne contaminants, such as noise, light, solids, liquids, water/waste water, gases, smoke, vapour, fumes, odour and particulates to appropriate personnel
Records	Records may include:

RANGE STATEMENT	
	• test and calibration results • equipment use, maintenance and servicing history • faulty or unsafe equipment
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		

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		

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		

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

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 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		

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/alarm/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		

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

EVIDENCE GUIDE	
	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

EVIDENCE GUIDE	
	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.

EVIDENCE GUIDE	
	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		

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		

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	

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		

PMBHAN103C Shift materials safely by hand

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the shifting of materials by hand in a safe manner. It applies to all sectors of the industry.

This competency is typically performed 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 operators who move packages, loose goods, materials and products by lifting, pushing and pulling without injury to themselves or damage to the materials being moved. The key factors are planning and executing the move in a safe and efficient manner. It includes:

- identifying the type of material to be moved
- identifying the route to be used
- identifying and using the most appropriate piece of equipment
- following OHS State regulations to complete the operation.

This competency unit includes the use of manual handling aids such as handcarts. It does NOT include the use of powered equipment/aids or licensed load shifting equipment.

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. Plan operations.	1.1 Correctly identify type and quantity of produce or material to be moved. 1.2 Identify the safest and most efficient and appropriate movement route.
2. Manually transfer products or materials.	2.1 Manually shift products or materials to and from production processes according to procedures and OHS State regulations. 2.2 Manually load specified products or materials at specific points during the manufacturing process, according to procedures and OHS State regulations.
3. Store, stack and/or relocate products or materials.	3.1 Manually stack products or materials according to procedures and OHS State regulations. 3.2 Manually store products or materials in correct locations. 3.3 Document and/or report material movements as required.

Required Skills and Knowledge

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

- Knowledge is required of good manual handling practice including organisation procedures and relevant State OHS regulations for manual handling and lift techniques sufficient to recognise potential problems and to take the appropriate action.
- Knowledge is required of organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work 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 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.

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

- It is essential that manual handling principles are applied and that the importance of safe manual handling techniques is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate action.
- It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to apply and/or explain:
 - correct OHS procedures
 - appropriate manual handling and lifting/moving techniques
 - appropriate lifting/moving equipment
 - relevant inventory systems.
- Competence includes the ability to be able to distinguish between jobs which:
 - may be easily and safely done by a single person
 - will require assistance from other people
 - require manual handling equipment
 - need mechanical lifting aids.
- Consistent performance should be demonstrated. For example, look to see that standard operating procedures and all safety procedures are adhered to

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 for the generation of evidence of the ability to respond to problems
 - by using a suitable simulation and/or a range of case studies/scenarios
 - through a combination of these techniques.
- In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.
- Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

- This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.
- Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.
-

Range Statement

RANGE STATEMENT

- The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.
- Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

- This competency applies to all work environments and sectors within the plastics, rubber and cabling industry. It includes the operation of all relevant ancillary equipment.
- The processes covered by this unit include, but are not limited to:
 - movement of materials
 - stacking/storing/relocating of materials.
 - Loads to be shifted may be, but are not limited to:
 - irregularly shaped

- packaged/unpackaged
- labelled/unlabelled.

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 are performed in accordance with standard procedures and work instructions.

Tools and equipment

- This competency includes tools and equipment such as:
- hand carts
- self-propelled trolleys
- wheelbarrows
- block and tackle
- relevant personal protective equipment.

Hazards

- Typical hazards include:
- spills
- dusts/vapours
- hazardous materials
- manual handling hazards

Problems

- Typical problems include:
- load too heavy or large for safe, easy moving
- load in awkward position for safe, easy moving
- clash of work priorities
- correct equipment not available.
- Appropriate action for problems outside of area of responsibility may be reporting to an appropriate person.
- Appropriate action for solving problems within area of responsibility includes asking questions and seeking assistance from appropriate persons/sources.
-

Unit Sector(s)

Not applicable.

PMBTECH502B Review and analyse production trials and specify retrials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the reviewing of trial results, analysing and correcting trial outcomes, and specifying and carrying out retrial procedures.

This competency is typically performed by technicians/technologists in all sectors of the industry.

Application of the Unit

Application of this unit

This competency applies to technicians who analyse and review production trials. The key factors are the understanding of the purpose of the trials, and the interpretation of the trial results compared to that purpose.

It includes:

- new product trials
- new process trials
- new equipment trials
- modifications to product trials
- modifications to process trials
- modifications to equipment trials.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has the prerequisite of *MSAOPS401A Trial new process or product*.

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. Review trial results.	1.1 Confirm trial objectives as a basis for comparison prior to review of results. 1.2 Review trial product quality results and compare with trial objectives to identify variations. 1.3 Review trial production results and compare with trial objectives to identify variations.
2. Analyse and correct trial outcome.	2.1 Analyse trial results to establish priorities for the correction of parameters which are outside specifications. 2.2 Recommend changes to achieve product quality and production requirements. 2.3 Make changes in to procedures to achieve the required product quality and production requirements.
3. Specify and carry out retrial procedures.	3.1 Specify retrial objectives and priorities to procedures. 3.2 Carry out retrial variations to achieve the trial

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.
	objectives to procedures. 3.3 Record trial results to procedures.

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 interpret trial results and specify appropriate retrieval conditions.

Knowledge of organization 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, the use of PPE in relation to handling materials, equipment operation and cleanup.

Knowledge as a basis for solving processing and material problems, including:

- a thorough understanding of polymer materials and processing
- calculate results from trial data
- interpret trial results in terms of trial objectives
- determine variations to trial procedures to overcome limitations found
- interpret results in terms of product end use requirements
- make recommendations for changes to materials, process and product based on trial results
- trial objectives
- preliminary product specifications (physical properties, size, weight, appearance)
- production requirements (output, rejects, yield, practical operating window)
- trial results
- product quality results
- production results
- changes
- product design and specifications
- mould, die and/or tooling design and construction
- material grade
- machine configuration or specification
- production specifications

- processing parameters
- retrieval objectives
- product quality
- production requirements
- variations
- sample size
- machine parameters
- material grade changes
- mould, die and/or tooling changes
- machine configurations.

Language, literacy and numeracy requirements

This unit requires high levels of numeracy and literacy with the ability to interpret technical specifications and reports. Advanced numeracy allowing the calculation and interpretation of statistics, product formulae and process conditions is also required.

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 *MSAOPS401A Trial new process or product*, 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 ability to apply an understanding of polymer materials and processing to the interpretation of trial results and making judgements about the trials in terms of the trial objectives

Consistent performance should be demonstrated. For example, look to see that the performance of at least one type of product or process trial on a typical machine has been correctly analysed and that there is evidence that other types of analyses can also be set up, run and completed satisfactorily.

Assessment method and context

It is preferred that assessment takes place on industrial equipment 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 for the generation of evidence of the ability to recognise, anticipate 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

This competency applies to all work environments and sectors within the plastics, rubber and cabling industry, but does require both a theoretical/mathematical and a practical analysis of the trial data.

The competency does not require 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.

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:

- procedures
- product specifications
- trial results and data
- data analysing and reporting tools (eg computer spreadsheets).

Hazards

Typical hazards include operating equipment.

Problems

'Anticipate and solve problems' means resolve a wide range of routine and non-routine problems, using product and process knowledge to develop solutions to problems which do not have a known solution/a solution recorded in the procedures.

Typical process and product problems may include:

- new products or processes
- new dies, moulds or tooling
- modified equipment or components
- modified or new materials.

Variables

Key variables to be monitored include production data.

Unit Sector(s)

Not applicable.

PSPPM402B Manage simple projects

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit covers management of generally low risk projects that may be small scale and managed by one person or a person with a small team. It includes implementing project start-up activities, coordinating project implementation, monitoring the project and arranging follow-up activities. Contract management requirements are not included as this aspect is addressed by units of competency within the Competency field of *Procurement and Contract Management*.

In practice, managing simple projects overlaps with other generalist and specialist work activities such as applying government processes, using resources, gathering information, managing contracts etc.

When this unit is completed in conjunction with *PSPPM401B Design simple projects* and *PSPPM403B Close simple projects*, the three units together are equivalent to the eight private sector Business Services project management competencies: BSBPM401A - BSBPM408A inclusive.

This unit, and unit *PSPPM405A Administer simple projects*, are mutually exclusive. One or the other, but not both, may contribute to a qualification.

This unit replaces and is equivalent to *PSPPM402A Implement projects*.

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements 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. Implement start-up activities

- 1.1 The *project plan* is updated with confirmed information for key dates and activities, resources and project governance details in accordance with the project implementation strategy
- 1.2 Project *stakeholders'* understanding of and agreement to fulfil the project requirements and their roles and responsibilities are confirmed
- 1.3 *Required systems* are established and maintained throughout the project in accordance with the project plan
- 1.4 A working knowledge of *project management tools* is used to facilitate integration of project activities and achievement of project outcomes

2. Coordinate project implementation

- 2.1 *Integration* and *management* of project activities are handled in accordance with the project plan
- 2.2 Stakeholder input and expectations are managed and their commitment is maintained throughout the life of the project in accordance with organisational policy and procedures and the project plan
- 2.3 Disagreements and disputes are resolved or referred to a higher authority in accordance with organisational policy and procedures
- 2.4 Project *change proposals* are received and changes are

ELEMENT	PERFORMANCE CRITERIA
	recommended/made in accordance with the project plan, and documented in accordance with <i>policy and procedures</i>
3. Monitor project	3.1 All aspects of the project are continually monitored and corrective action is taken as necessary to maintain progress in accordance with the project plan 3.2 Consultation and reporting mechanisms are applied in accordance with the communication plan when dealing with management, staff and/or contractors, steering committee members or other stakeholders 3.3 Project governance plans and any related contracts are monitored, reviewed and amended as appropriate, and results are reported in accordance with the communication plan 3.4 Project progress is monitored against agreed milestones in accordance with the project plan to provide a measure of performance throughout the life of the contract 3.5 Programmed review of objectives and achievement is implemented in accordance with the project plan
4. Arrange project follow-up activities	4.1 Project deliverables are analysed against <i>specifications</i>, performance standards and project objectives, under broad guidance, and the results are reported to stakeholders 4.2 An initial support package or product manual is produced, if required, to provide guidance for stakeholders who will be required to apply the project results 4.3 The support package includes options for stakeholders to take account of environmental and cultural factors in applying project results 4.4 Operational and support authorities are consulted to research any testing/trialling/building requirements resulting from the project, and evaluation of any recommendations are included in the project report

Required Skills and Knowledge

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:

leading and mentoring people to achieve project deliverables

REQUIRED SKILLS AND KNOWLEDGE

maintaining agreement of stakeholders and team members to timelines, roles and responsibilities
communicating with stakeholders and team members using a range of communication styles to suit different audiences and purposes
responding to diversity, including gender and disability
using project management tools applicable to small scale or low risk projects
applying ethical decision making and problem solving related to project management of small scale or low risk projects
writing recommendations and preparing implementation support packages requiring precision of expression
applying workplace safety procedures in line with project requirements
accessing/preparing information electronically or in hard copy

Knowledge requirements

Look for evidence that confirms knowledge and understanding of:
legislation, organisational policies and procedures that may impact on project management, for example:
public sector codes of ethics/conduct
occupational health and safety and environment requirements
project governance requirements
quality standards
risk management
procurement guidelines
human resources
equal employment opportunity, equity and diversity principles
project management tools to suit a range of small scale or low risk projects
project management principles
organisational and political context

Evidence Guide

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	• <i>Pre-requisite</i> units that <u>must</u> be achieved <u>prior</u> to this unit: <i>Nil</i> • <i>Co-requisite</i> units that <u>must</u> be assessed <u>with</u> this unit: <i>Nil</i>

EVIDENCE GUIDE

together

- *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:

PSPETHC401A Uphold and support the values and principles of public service

PSPGOV402B Deliver and monitor service to clients

PSPGOV403B Use resources to achieve work unit goals

PSPGOV411A Deal with conflict

PSPGOV412A Use advanced workplace communication strategies

PSPGOV422A Apply government processes

PSPLEGN401A Encourage compliance with legislation in the public sector

PSPPROC410A Administer contracts

PSPPM401B Design simple projects

PSPPM403B Close simple projects

- *Excluded units* that may not contribute to the same qualification as this unit:

PSPPM405A Administer simple projects

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)
- simple projects managed in a range of (3 or more) contexts (or occasions, over time)

Resources required to carry out assessment

These resources include:

- legislation, guidelines, procedures and protocols relating to project management
- workplace project documentation
- scenarios and case studies
- examples of project management tools

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 implementing projects, including coping with difficulties, irregularities and breakdowns in routine

EVIDENCE GUIDE

- simple projects managed in a range of (3 or more) contexts (or occasions, over time)

Assessment methods should reflect workplace demands, such as literacy, and the needs of particular groups, such as:

- people with disabilities
- people from culturally and linguistically diverse backgrounds
- Aboriginal and Torres Strait Islander people
- women
- young people
- older people
- people in rural and remote locations

Assessment methods suitable for valid and reliable assessment of this competency may include, but are not limited to, a combination of 2 or more of:

- case studies
- demonstration
- portfolios
- 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

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 *italics* in the Performance Criteria is explained here.

Project plan will include some or all of

- acquisition strategies
- budget and financial management strategy
- contract management
- cost estimates

RANGE STATEMENT

- evaluation criteria
- expected outcomes/measurable benefits of the project
- facilities
- inclusions and exclusions from project
- information/communication strategy
- intellectual property strategies
- milestones
- objectives
- outputs/project deliverables and their acceptance criteria
- people plan including human resource management and human resource development
- performance criteria/indicators
- project control mechanisms
- project implementation strategy
- project governance strategy
- purpose
- quality assurance
- quality control
- quality standards for project
- rationale
- required project resources
- resource management
- risk management
- roles and responsibilities
- schedule/timeline
- task/work breakdown structure (WBS)

Stakeholders may include

- project sponsor/funding bodies
- clients or customers (internal and external)
- industry
- other agencies
- general public
- relevant interest groups
- unions
- functional areas
- the organisation's senior management
- Ministers
- project team
- steering committee members
- end user
- supplier/service provider

RANGE STATEMENT

Required systems for project management may include

- planning and monitoring system
- financial management including:
- budget allocation/funding
- income generated
- expenditure
- recordkeeping for documented information such as:
- correspondence
- quality data including survey, needs, test results
- contracts
- time allocated and spent on each aspect of the project
- progress reports
- performance reports against milestones
- project outcomes
- samples, prototypes, models

Project management tools may include

- risk analysis
- organisational project governance framework
- communications plan
- reporting framework
- project management software and other tools:
- Gantt and bar charts
- Program Evaluation and Review Technique (PERT) charts
- Critical Path Method
- cost schedule control system
- logistics support analysis
- life cycle cost analysis
- spreadsheets
- recording systems - electronic and manual

Integration of project activities may include

- scope
- time
- cost
- quality
- human resources
- communications
- risk
- procurement

Management may include

- scope management
- communication and reporting
- schedule management
- financial management
- quality management

RANGE STATEMENT

	- resources management - people management - logistics management - risk management - contract management - change management
<i>Change proposals may include</i>	- scope - administration - engineering, technical, technology changes - time - cost - resources
<i>Policy and procedures may include</i>	- government legislation (Federal, State and Local) affecting organisation's administration such as: - public sector management acts - financial management and accounting legislation and regulations - privacy legislation - government and organisational guidelines and procedures relating to: - project governance - resourcing - security - strategic plans - recruitment - risk management - procurement guidelines - designation approvals - industrial agreements
<i>Specifications may include</i>	- functional - technical - performance - material

Unit Sector(s)

Not applicable.

Competency field

Competency field Project Management

PSPPM502B Manage complex projects

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit covers management of projects that may be reasonably complex in terms of scope, degree of risk, political, cultural and social factors that apply, consequences of failure and degree of control of the projects. It includes managing start-up, project implementation, project integration and follow-up activities. Contract management requirements are not included as this aspect is addressed by units of competency within the Competency field of *Procurement and Contract Management*.

In practice, managing complex projects overlaps with other generalist and specialist work activities such as acting ethically, coordinating resource allocation and usage, developing client services, undertaking research and analysis, etc.

When this unit is completed in conjunction with *PSPPM501B Design complex projects*, and *PSPPM503B Close complex projects*, the three units together are equivalent to the nine private sector Business Services project management competencies: BSBPM501A - BSBPM509A inclusive.

This unit replaces and is equivalent to *PSPPM502A Manage projects*.

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements 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. Manage start-up activities	1.1 <i>Project plans</i> are refined in consultation with steering committee and team members, and precise details are included for schedules of activities, milestones and resources 1.2 <i>Required systems</i> are established and maintained throughout the project in accordance with the complexity of the project and in line with the project plan 1.3 Project team members' understanding of and commitment to fulfilling the project requirements and their roles and responsibilities for the duration of the project are confirmed 1.4 <i>Project management tools</i> are selected and applied effectively to achieve project outcomes
2. Manage project implementation	2.1 <i>Integration and management</i> of complex project activities are handled in accordance with the project plan 2.2 Leadership and required <i>development</i> are provided to the project team, and morale, stress levels and triggers are managed throughout the life of the project in accordance with organisational <i>policy and procedures</i> 2.3 <i>Stakeholder</i> input and expectations are managed throughout the project in accordance with the communication plan 2.4 Disagreements and disputes are resolved to the satisfaction of stakeholders or referred to a higher authority in accordance with organisational policy and procedures 2.5 Project <i>change proposals</i> are negotiated, agreed and documented in accordance with policy and procedures
3. Manage project	3.1 All aspects of the project and related projects are integrated and

ELEMENT**PERFORMANCE CRITERIA****integration**

links are established to ensure objectives are met in accordance with the project plan

3.2 Consultation and reporting mechanisms are applied in accordance with the communication plan and staff and contractors are regularly consulted to discuss progress and ensure effective results

3.3 Project integration is monitored, and management plans and any related contracts are reviewed and amended as appropriate, with results reported in accordance with mechanisms identified in the communication plan

3.4 Ongoing progress is monitored against agreed milestones in accordance with the project plan to provide a measure of performance throughout the life of the project

3.5 Programmed review of objectives and achievement is planned and implemented in accordance with the project plan

4. Coordinate project follow-up activities

4.1 Significant judgment is applied in the analysis of project deliverables against *specifications*, performance standards and project objectives, and the results are reported to stakeholders

4.2 Support package arrangements are identified and offered to stakeholders who will be required to apply the project results

4.3 Options for stakeholders to take account of environmental and cultural factors in applying the project results are included in the support package

4.4 Operational and support authorities are consulted to investigate any testing/trialling/building and evaluation requirements resulting from the project, and funding implications estimated in project report

Required Skills and Knowledge**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:

leading and mentoring people to achieve project outcomes

maintaining agreement of stakeholders and team members to timelines, roles and responsibilities

negotiating with stakeholders and team members using communication styles to suit

REQUIRED SKILLS AND KNOWLEDGE

different audiences and purposes
responding to diversity, including gender and disability
using project management tools applicable to reasonably complex projects
applying ethical decision making and problem solving related to project management of reasonably complex projects
writing recommendations and preparing project reports requiring precision of expression
applying workplace safety procedures in line with project requirements
accessing/preparing information electronically or in hard copy

Knowledge requirements

Look for evidence that confirms knowledge and understanding of:
legislation, organisational policies and procedures that may impact on project implementation, for example:
public sector codes of ethics/conduct
occupational health and safety and environmental and sustainability requirements
project governance requirements
quality standards
risk management
procurement guidelines
financial management and budgetary framework
human resources
equal employment opportunity, equity and diversity principles
project management tools to suit a range of reasonably complex projects in terms of scope, degree of risk, political, cultural and social factors that apply, consequences of failure and degree of control of the project
project management systems
organisational and political context
critical analysis in a project management context
business and commercial issues related to the projects managed

Evidence Guide

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.

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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:

PSPETHC501B Promote the values and ethos of public service

PSPGOV502B Develop client services

PSPGOV503B Coordinate resource allocation and usage

PSPGOV504B Undertake research and analysis

PSPGOV505A Promote diversity

PSPPM501B Design complex projects

PSPPM503B Close complex projects

PSPPROC501A Manage contract risk

PSPPROC503A Manage contract performance

Overview of evidence requirements

In addition to integrated demonstration of the elements and their related performance criteria, look for evidence that confirms:

- the knowledge requirements of this unit
- the skill requirements of this unit
- application of the Employability Skills as they relate to this unit (see Employability Summaries in Qualifications Framework)
- management of complex projects in a range of (3 or more) contexts (or occasions, over time)

Resources required to carry out assessment

These resources include:

- legislation, guidelines, procedures and protocols relating to project management in the organisation and the public sector
- workplace project documentation
- scenarios and case studies
- examples of project management tools

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 complete projects, including coping with difficulties, irregularities and breakdowns in routine
- management of complex projects in a range of (3 or more) contexts (or occasions, over time)

Assessment methods should reflect workplace demands, such as

EVIDENCE GUIDE

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
- portfolios
- 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

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 *italics* in the Performance Criteria is explained here.

Project plans will include some or all of

- acquisition strategies
- budget and financial management strategy
- contract management
- cost estimates
- evaluation criteria
- expected outcomes/measurable benefits of the project
- facilities

- inclusions and exclusions from project
- information/communication strategy
- intellectual property strategies
- milestones
- objectives
- outputs/project deliverables and their acceptance criteria
- people plan including human resource management and human resource development
- performance criteria/indicators
- project control mechanisms
- project implementation strategy
- project governance strategy
- purpose
- quality assurance
- quality control
- quality standards for project
- rationale
- required project resources
- resource management
- risk management
- roles and responsibilities
- schedule/timeline
- task/work breakdown structure (WBS)
- planning and monitoring system
- financial management including:
 - budget allocation/funding
 - income generated
 - expenditure
- recordkeeping for documented information such as:
 - correspondence
 - quality data including survey, needs, test results
 - contracts
 - time allocated and spent on each aspect of the project
 - progress reports
 - performance reports against milestones
 - project outcomes
 - samples, prototypes, models
- risk analysis
- organisational project governance framework
- communications plan
- reporting framework
- project management software and other tools:

Required systems for project management may include

Project management tools may include

	• Gantt and bar charts • Program Evaluation and Review Technique (PERT) charts • Critical Path Method • cost schedule control system • logistics support analysis • life cycle cost analysis • spreadsheets • recording systems - electronic and manual
<i>Integration of project activities may include</i>	• scope • time • cost • quality • human resources • communications • risk • procurement
<i>Management may include</i>	• scope management • communication and reporting • schedule management • financial management • fraud control • quality management • resources management • people management • logistics management • risk management • contract management • project implementation • transition • change management
<i>Development may include</i>	• regular meetings • feedback • encouragement • mentoring and coaching • additional physical and human resources (within allocated budget) if and as required
<i>Policy and procedures may include</i>	• government legislation (Federal, State and Local) affecting organisation's administration such as: • public sector management acts • financial management and accounting legislation and regulations • privacy legislation

- government and organisational guidelines and procedures relating to:
- project governance
- resourcing
- security
- strategic plans
- recruitment
- risk management
- procurement guidelines
- designation approvals
- industrial agreements
- environment and sustainability

- Stakeholders may include*
- project sponsor/funding bodies
 - clients or customers (internal and external)
 - industry
 - other agencies
 - general public
 - relevant interest groups
 - unions
 - functional areas
 - the organisation's senior management
 - Ministers
 - project team
 - steering committee
 - end user
 - supplier/service provider

- Contract change proposals may include*
- administration
 - cost
 - engineering, technical, technology changes
 - resources
 - scope
 - specifications
 - time

- Specifications may include*
- functional
 - technical
 - performance
 - material

Unit Sector(s)

Not applicable.

Competency field

Competency field Project Management

TAAASS301B Contribute to assessment

Modification History

Not applicable.

Unit Descriptor

This unit specifies the competence required to contribute to the assessment process.

Application of the Unit

This unit addresses the competence of assisting in the assessment process by collecting evidence to support a candidates demonstration of competence. It involves the collection, examination, documentation and presentation of quality evidence which contributes to the assessment decision against the relevant competency standard.

This competency 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 (AQTF) and the assessor requirements of the relevant Training Package.

the qualified assessor provides guidance and supervision.

Achievement of this unit requires competency in observation skills, effective communication and interpersonal skills and applied knowledge of the principles of assessment and the rules of evidence.

The competency specified in this unit is typically required by an individual who may have technical/vocational expertise and/or may have a supervisory or mentoring/ coaching work role, and for whom collecting evidence for assessment is an adjunct to principal work responsibilities.

It may have application in a range of circumstances including:

where the organisation uses a team assessment approach

in rural/remote areas where access to qualified assessors may be limited (and where assessor guidance can be provided by technology)

as part of the assessment arrangements for collecting evidence over a period of time and in a range of contexts.

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

Elements and Performance Criteria

Element	Performance Criteria
1 Clarify role and responsibilities in the assessment process	1.1 Purpose of assessment is discussed and confirmed with relevant people using appropriate communications and interpersonal skills 1.2 Benchmark/s for assessment are discussed and confirmed with qualified assessor 1.3 The assessment plan is accessed, read and clarified with qualified assessor 1.4 Specific responsibilities in gathering evidence and types of evidence to be gathered are discussed and agreed with qualified assessor
2 Confirm organisational arrangements for evidence gathering	2.1 Nominated assessment methods and assessment tools to be used in collecting evidence are clarified with the qualified assessor to ensure the instruments to collect evidence and the procedures to be followed are clear 2.2 The assessment context including candidate's characteristics and any need for reasonable adjustments are discussed and confirmed with relevant people

- 2.3 **Resource requirements** are confirmed and arranged in consultation with relevant people
 - 2.4 Documentation setting out relevant assessment system policies and procedures, legal/organisational/ethical requirements and any other relevant advice on assessment is accessed and confirmed with relevant people
- 3 **Collect evidence in accordance with the assessment plan**
 - 3.1 The assessment process is explained to the candidate, including the different responsibilities of the parties involved, and any candidate issues/concerns are referred to the qualified assessor prior to undertaking assessment activities
 - 3.2 Assessment tools are used to gather quality evidence using appropriate communication and interpersonal skills with the candidate and other relevant people
 - 3.3 Evidence is collected within available time and resources, in accordance with organisational/legal/ethical requirements
 - 3.4 Evidence gathering assessment activities are reviewed against the **principles of assessment** and collected evidence is examined to determine whether it meets the **rules of evidence**
 - 3.5 **Limitations and issues** in collecting quality evidence are identified and assistance is sought from qualified assessor/s, where required
- 4 **Record and report findings**
 - 4.1 Evidence is documented and recorded in accordance with assessment system policies and procedures
 - 4.2 Evidence is organised in a format suitable for analysis and provided to the qualified assessor in accordance with assessment system policies and procedures
 - 4.3 Feedback is actively sought from the qualified assessor on whether the evidence gathering activities meet the principles of assessment and the collected evidence meets the rules of evidence
 - 4.4 Areas for improvement in collecting evidence are documented for future assessment activities

Required Skills and Knowledge

Not applicable.

Evidence 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

To demonstrate competence against this unit, candidates must be able to provide evidence that they have gathered appropriate and relevant assessment evidence using a variety of assessment methods and employing existing assessment tools in accordance with an assessment plan.

This evidence must show the methods used to collect evidence; completed evidence gathering tools; how evidence was collated in a suitable format for assessment; how the selected tools were used to collect evidence; and how organisational procedures regarding evidence collection, recording and reporting were followed.

Evidence Requirements

Required knowledge includes:

what is competency-based assessment, including criterion referenced, competency standards as the benchmarks for assessment, competency-based reporting

the principles of assessment, being validity, reliability, fairness and flexibility

the rules of quality evidence, in that evidence must be valid, authentic, sufficient and current

the different purposes of assessment

the diversity of assessment contexts

what is evidence and different types of evidence

how evidence is gathered - what are assessment methods and different types of methods

what is an assessment tool

what is an assessment plan

practical knowledge of the potential barriers and processes relating to evidence gathering procedures and assessment processes

the organisational assessment system policies and procedures relevant to this unit of competency

technical/subject area being assessed

cultural sensitivity and equity considerations

relevant policy, legislation, codes of practice and national standards including Commonwealth and state/territory legislation, for example:

licensing requirements

recording information and confidentiality requirements

equal employment opportunity, disability, discrimination

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 and employees

Required skills and attributes include:

observation skills to observe candidate performance

cognitive and interpretation skills to:

ensure collection of valid and reliable

evidence

identify gaps/issues in evidence collection

confirm appropriate assessment tools and methods to be used

organisation skills to:

use required resources

carry out the evidence collection

time management skills

to schedule assessment events/activities

work with candidate on suitable times

using assessment methods and tools

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

discuss evidence gathering processes with candidate/s

establish a working relationship with assessor and candidate/s

provide constructive and supportive feedback

ask appropriate questions to clarify and confirm instructions for evidence gathering

provide clear and concrete options and/or advice

attributes including:

willingness to contribute positively to the assessment process

capacity to encourage, accept and use feedback

Products that could be used as evidence include:

capacity to work sensitively and ethically when gathering information

completed assessment tools/templates/checklists

documentation/records of the evidence gathered

feedback from the candidate, qualified assessor, supervisor

Processes that could be used as evidence include:

how benchmarks and other documents were interpreted, and why

how evidence gathering activities were scheduled

how the rules of evidence were used to collect and review evidence, and why

Resource implications for assessment include:

access to qualified assessor

access to candidates for assessment purposes

access to supervisor or other relevant people

access to benchmarks and other assessment documentation

assessment materials and tools

workplace documentation

support for candidate's specific requirements

time considerations

The collection of quality evidence requires that:

assessment must address the scope of this unit and reflect all components of the unit, i.e. the Elements, Performance Criteria, Range Statement, Evidence Guide, Employability Skills

a range of appropriate assessment methods/evidence gathering techniques is used to determine competency

evidence must be gathered in the workplace whenever possible. Where no workplace is available, a simulated workplace must be provided

the evidence collected must relate to a number of performances assessed at different points in time and in a learning and assessment pathway these must be separated

	by further learning and practice
	assessment meets the rules of evidence
	a judgement of competence 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
Specific evidence requirements must include:	a minimum of three evidence gathering activities, carried out with different candidate/s in each activity the examination of gathered evidence in complying with the rules of evidence a summary of evidence findings using business technology feedback sought from others involved in the assessment process
Integrated assessment means that:	this unit can be assessed alone or with TAADEL301C Provide training through instruction and demonstration of work skills.

Range Statement

The range statement relates to the unit of competency as a whole. 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 process is:	the series of steps in the assessment cycle
Purpose of assessment may be:	recognise current existing competency of candidate/s determine if competency has been achieved following learning establish candidate/s progress towards achievement of competence determine language, literacy, numeracy

	needs of candidates/s
	certify competence through a Statement of Attainment
	establish progress towards a qualification
	determine training gaps of candidate/s
	measure work performance
	classify employees/support career progression
	meet organisational requirements for work - operate equipment/develop new skills
	licensing or regulatory requirements
Relevant people must include:	qualified assessor/s
	candidate/s
Relevant people may include:	managers
	supervisors
	technical/subject experts
	training coordinators
	industry regulators
	employee and employer representatives
Appropriate communication and interpersonal skills may include:	engaging in two-way interaction
	providing constructive feedback
	using active listening
	using appropriate questioning to clarify and confirm instructions for evidence gathering
	accurately interpreting non-verbal and verbal messages
	providing clear advice
	using language that the candidate uses and which is appropriate to the assessment context and work encompassed by the competency standards
	using language and concepts appropriate to cultural and background of the candidate
Benchmark/s for assessment refers to:	the criterion against which the candidate is assessed which, may be a competency standard/unit of competency, assessment

An **assessment plan** is the overall planning document for the assessment process, may include:

criteria of course curricula, performance specifications, product specifications

the purpose and aims of the assessment

the context of assessment

relevant benchmark/s for assessment to be used as the benchmarks for assessment

other assessment information/documentation identified as relevant

identified personnel

identified assessment methods and assessment tools

possibilities for clustering units of competency for assessment purposes

identified OHS hazards, including assessed risks and control strategies

material and/or physical resources required

organisational arrangements for conducting assessment

OHS reporting requirements

any special assessment needs, e.g. personal protective equipment requirements

outline of assessment milestones, time lines and target dates

candidate self-assessment procedures

connections to relevant organisational plans, policies and procedures

Evidence is:

information/materials/products which support a candidate's claim of demonstrated competency

Types of evidence may be:

direct e.g. observation of work activities under real/simulated work conditions, examples of work products

indirect, e.g. third party reports from a range of sources

supplementary e.g. question and answer, work records, training records, portfolios

candidate gathered evidence

	assessor gathered evidence current/recent/historical combination of above
Assessment methods are the particular techniques used to gather different types of evidence and may include:	conducting real work/real time activities (for example, direct observation and third party reports) carrying out structured activities (for example, simulation exercises, demonstration and activity sheets) questioning (for example, computer, oral and written questions) collecting portfolios/evidence compiled by the candidate obtaining historical evidence regarding prior learning
Assessment tools contain:	the instruments to be used for gathering evidence such as: a profile of acceptable performance measures templates/proformas specific questions or activities evidence/observation checklists checklists for the evaluation of work samples candidate self-assessment materials
	the procedures, information and instructions for the assessor/candidate relating to the use of assessment instruments and assessment condition
Assessment context may include:	the environment in which the assessment will be carried out opportunities for collecting evidence in a number of situations the purpose of the assessment who carries out the assessment relationship between units of competency and candidate's workplace auspicing and partnership arrangements

period of time that assessment takes place
apportionment of costs/fees
quality assurance mechanisms
privacy and confidentiality approaches

Candidate's characteristics may include:

level of work experience
level and experiences of previous learning and assessment
motivation for assessment - personal and/or organisational
English language, literacy and/or numeracy levels/needs
physical impairment or disability involving hearing, vision, voice, mobility
intellectual impairment or disability
medical condition such as arthritis, epilepsy, diabetes, asthma that is not obvious but may impact on assessment
differences in learning progress
religious and spiritual observances
cultural background images/perceptions
age
gender

Reasonable adjustments may include:

taking into account candidate's language, literacy, numeracy requirements
providing of personal support services (for example: reader, interpreter, attendant carer, scribe)
using of adaptive technology or special equipment
flexible assessment sessions to allow for fatigue or administering of medication
format of assessment materials (for example, in Braille, first language, use of audiotape/videotape)
making adjustments to the physical environment
revising of proposed assessment

	methods/tools
	considering age and gender
	considering cultural beliefs, traditional practices and religious observances
	arranging for a member of the community to accompany the candidate
Resource requirements may include:	resources specific to evidence gathering activities
	access to assessors
	access to policy and procedures
	access to subject/technical experts
	OHS requirements
	plant, equipment, technology
Assessment system policies and procedures may include:	candidate selection
	rational and purpose of competency-based assessment
	assessment records/data management/information management
	recognition of current competency/recognition of prior learning/credit arrangements
	assessors - needs, qualifications, maintaining currency
	assessment reporting procedures
	assessment appeals
	candidate grievances/complaints
	validation
	evaluation/internal audit
	costs/resourcing
	access and equity/reasonable adjustment
	partnership arrangements
	links with human resource or industrial relations systems
	links with overall quality management system

Legal/organisational/ethical requirements may include:

assessment system policies and procedures
assessment strategy requirements
quality assurance systems
reporting, recording and retrieval systems for assessment
business and performance plans
access and equity policies and procedures
collaborative/partnership arrangements
defined resource parameters
mutual recognition arrangements
industrial relations systems and processes, awards/enterprise agreements
Australian Quality Training Framework (AQTF) standards on assessment
registration scope
human resources policies/procedures
legal requirements including anti-discrimination, equal employment, job role/responsibilities/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

Relevant advice on assessment may include:

guidance on the principles of assessment and how they are applied
information on the rules of evidence and how these are applied
assessment materials (for example, guidelines and evidence gathering workbooks)
information from Training Package Assessment Guidelines
AQTF standards relating to assessment

OHS standards/guidelines
advice/information from other assessors
course guidelines and parameters
candidate self-assessments
individual unit or integrated approaches to
competency assessment

Principles of assessment are:

validity
reliability
flexibility
fairness

To meet the **rules of evidence**, evidence
must be:

valid, for example:
address the elements and Performance
Criteria
reflect the skills and knowledge described in
the relevant units of competency
show application in the context described in
the Range Statement
demonstrate that performance, skills and
knowledge are applied in real/simulated
workplace situations

current, for example:
demonstrate the candidate's current skills and
knowledge
comply with current standards

sufficient, for example:
demonstrate competence over a period of
time
demonstrate repeatable competence
not inflate the language, literacy and
numeracy requirements beyond those
required in performing the work
task/function

authentic, for example:

Limitations and issues may relate to:

be the work of the candidate

be corroborated/verified

relationship between main job and responsibilities in evidence gathering activities

ability to meet the candidate's needs

access to candidate and/or relevant people

levels of understanding of organisation's quality processes

own level of vocational competence

own understanding of competency-based assessment

need to meet legal responsibilities

risk management and OHS issues which impact on the capacity to collect evidence

confirmation of relevant unpaid or volunteer experience

examples of work products

simulation activities

projects/assignments

Unit Sector(s)

Not applicable.

Competency Field

Assessment

TAAASS401C Plan and organise assessment

Modification History

Not applicable.

Unit Descriptor

This unit specifies the competence required to plan and organise the assessment process, including recognition of prior learning (RPL), in a competency-based assessment system.

Application of the Unit

This unit addresses the competence of planning the assessment process and making the organisational arrangements which enable assessment to occur. It includes assessments carried out as part of a Recognition of Prior Learning Process (RPL) or as part of a learning and assessment pathway.

The critical focus of this unit is on developing an assessment plan that will be used to guide assessor/s in conducting competency-based assessments. The unit also covers contextualisation of the assessment benchmarks and assessment tools to address the environment in which assessment will take place and organising the human, material and physical resources needed to conduct the assessment.

This competence applies to planning and organising an assessment process, including RPL which may involve single or multiple candidates being assessed against individual or multiple unit/s of competency.

The planning function in assessment is distinguished as a discrete activity and may be undertaken by the assessor responsible for assessing the candidates reflected in the assessment plan or by another person in the organisation.

This competence is to be applied in the context of an existing assessment strategy which documents the overall framework for assessment at a qualification level. In this context, the assessment plan adds further detail relating to the specific organisational arrangements for assessment/s, including RPL against individual unit/s of competency.

The competence of developing an assessment strategy is separately addressed in two other units of the **TAA04 Training and Assessment Training Package: TAADES501B Design and develop learning strategies** (in a learning and assessment pathway) and **TAAASS501B Lead and co-ordinate assessment systems and services** (in an assessment only pathway).

The achievement of this unit includes interpretation of competency standards, (where competency standards are used as the benchmarks for assessment). **TAADES401B Use Training Packages to meet client needs** addresses this skill in depth.

The competence specified in this unit is typically required by assessors, workplace supervisors with assessment planning responsibilities, trainers or other assessors responsible for planning assessment, including RPL

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

Elements and Performance Criteria

Element	Performance Criteria
1 Determine approach for assessment	1.1 Candidate/s are identified/confirmed and the purpose/s and context of assessment/ RPL are established/ confirmed with relevant people in accordance with legal/organisational/ethical requirements 1.2 A decision is made whether assessment will be undertaken within an RPL, a learning and assessment pathway or a combined approach 1.3 The assessment strategy is accessed and used to guide the development of the assessment plan, where applicable 1.4 The benchmarks for assessment/ RPL are identified/confirmed and accessed
2 Prepare the assessment/	2.1 The assessment benchmarks are interpreted to determine the evidence and types of evidence

- RPL plan**
- needed to demonstrate competency in accordance with the **rules of evidence**
- 2.2 Where competency standards are used as benchmarks, **all component parts of the competency standards**, are addressed in defining and documenting the evidence to be collected
- 2.3 Any **related documentation** to support planning the assessment process is accessed and interpreted
- 2.4 **Assessment/RPL methods** and **assessment tools** are **selected/confirmed** which address the evidence to be collected in accordance with the **principles of assessment**
- 2.5 Specific **material and physical resources** required to collect evidence are identified and documented
- 2.6 Roles and responsibilities of all people involved in the assessment process are clarified, agreed and documented
- 2.7 Timelines and time periods for evidence collection are determined and all information to be included in the **assessment plan** is documented
- 2.8 The assessment/RPL plan is confirmed with **relevant personnel**
- 3 **Contextualise and review assessment/ RPL plan**
- 3.1 **Characteristics of the candidate/s** and any allowances for **reasonable adjustments and/or specific needs** are identified/clarified with relevant people and documented
- 3.2 Where required, competency standards are **contextualised**, to reflect the operating environment in which assessment will occur, in accordance with **contextualisation guidelines**
- 3.3 Selected assessment methods and assessment tools are examined and adjusted, where required, to ensure continuing applicability taking into account: any contextualisation of competency standards
reasonable adjustment/s, where identified
integration of assessment activities, where appropriate and practical

capacity to support **recognition of prior learning**

- 3.4 Adjusted assessment tools are reviewed to ensure the specifications of the competency standards are still addressed
 - 3.5 The assessment plan is updated, as needed, to reflect ongoing contextualisation needs, any changes in organisational resource requirements or changes in response to the conduct of assessment
 - 3.6 Assessment plan/s are stored and retrieved in accordance with **assessment system policies and procedures** and legal/organisational/ethical requirements
- 4 **Organise assessment/ RPL arrangements**
- 4.1 Identified material and physical resource requirements are arranged in accordance with assessment system policies and procedures and legal/organisational/ethical requirements
 - 4.2 Any **specialist support** required for assessment/ RPL is organised and arranged in accordance with organisational/ethical/legal requirements, where required
 - 4.3 Roles and responsibilities of all people involved in the assessment/ RPL process are organised
 - 4.4 Effective **communication strategies** are established to encourage regular communication flow and feedback with relevant people involved in the assessment/RPL process
 - 4.5 Assessment/ RPL record keeping and reporting arrangements are confirmed

Required Skills and Knowledge

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

Required skills

cognitive interpretation skills to:

accurately interpret competency standards and other assessment documentation

identify opportunities for integrated competency assessment

contextualise competency standards to the operating assessment environment, including RPL

sort information

observation skills to:

assess the effectiveness of the organisation's assessment, including RPL operations

identify where improvement to the assessment process can be made

identify where improvement to RPL policy and procedures can be made

technology skills to:

use appropriate equipment and software to communicate effectively with others

research and evaluation skills to:

obtain competency standards and other assessment information, assessment tools and other relevant assessment resources

research candidate characteristics and any reasonable adjustment needs

identify and confirm required material and physical resources

evaluate feedback, and determine and implement improvements to processes

make recommendations

planning skills relating to formulation of the assessment plan

organisational skills relating to organising resources required

literacy skills to:

read and interpret relevant information to design and facilitate assessment and recognition processes

prepare required documentation and information for those involved in assessment processes

communication skills to:

discuss assessment, including RPL processes with clients and assessors

establish professional relationships and networks

sensitivity to access and equity considerations and candidate diversity

capacity to promote and implement equity, fairness, validity, reliability and flexibility in planning an assessment process

Required knowledge

competency-based assessment: work focused, criterion referenced, standards-based, evidence-based

the 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

the four principles of assessment and how they guide the assessment process

what is evidence and different types of evidence used in competency-based assessments, including RPL

the four rules of evidence and how they guide evidence collection

different types of assessment methods, including suitability for collecting various types of evidence

assessment tools and their purpose; different types of tools; relevance of different tools for specific evidence gathering opportunities

different resource requirements for assessment and associated costs

where to source other relevant assessment information and how to incorporate this into the plan

the principles of inclusivity, and strategies for reasonable adjustment, without compromise to the competency standards

sources and types of specialist support to candidates

methodologies suitable for reviewing assessment tools

the assessment system policies and procedures established by the industry and/or organisation

the RPL policies and procedures established by the organisation

risks and requirements associated with different assessment applications in various contexts, including:

capacities of assessors at higher AQF levels

when linked to licensing

legal implications of assessing competence

the relevant organisational/legal/ethical requirements impacting on the planning and organisation of assessment, as set out in the Range Statement of the relevant competency standards

other relevant policy, legislation, codes of practice and national standards including national Commonwealth and state/territory legislation for example:

copyright and privacy laws in terms of electronic technology

security of information

plagiarism

licensing requirements

anti-discrimination including equal opportunity, racial vilification and disability discrimination

workplace relations

industrial awards/enterprise agreements

OHS responsibilities associated with planning and organising assessment, such as:

hazards commonly found, and preferred risk controls for the specific assessment environment

OHS procedures to be observed in the assessment process

safe use and maintenance of relevant equipment

sources of OHS information

Evidence Guide

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of Assessment

To demonstrate competence against this unit, candidates must be able to provide evidence that they have developed an assessment plan and organised the material resources and personnel to support the assessment process.

The evidence provided must describe how the purpose of assessment was identified; contain structured plans that detail the selection/confirmation of assessment methods and tools, and assessment environments; include appropriate communication strategies with relevant people regarding the assessment process; outline resource requirements and special assistance required throughout the assessment process; and include recording and reporting requirements

Products that could be used as evidence include:

assessment plans

modified/adjusted assessment tools to allow for specific needs

contextualised competency standards

documentation of consultations with clients and other stakeholders regarding the

Processes that could be used as evidence include:

assessment purpose and context

how competency standards and other documents were interpreted

how assessment activities were scheduled

how RPL is incorporated in the assessment process

how resources were identified and obtained

how communication systems were used to include relevant stakeholders in the planning process

how assistance was sought from individuals providing specialist support

Resource implications for assessment include:

access to relevant Training Package/s

access to assessment materials and tools

access to other relevant assessment information

access to suitable assessment venue/equipment

access to RPL policy and procedures

workplace documentation

cost/time considerations

personnel requirements

The collection of quality evidence requires that:

assessment must address the scope of this unit and assessment must address the scope of this unit and reflect all components of the unit, i.e. the Elements, Performance Criteria, Range Statement, Evidence Guide, Employability Skills

a range of appropriate assessment methods/evidence gathering techniques is used to determine competency, including RPL.

evidence must be gathered in the workplace whenever possible. Where no workplace is available, a simulated workplace must be provided

the evidence collected must relate to a number of performances assessed at different points in time and in a learning and

Specific evidence requirements must include:

assessment pathway these must be separated by further learning and practice

evidence collected must relate to at least one RPL assessment

assessment meets the rules of evidence

a judgement of competence 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 demonstrate

evidence of planning and organising the assessment process on a minimum of two occasions. The evidence collected must:

address the provision of documented assessment plans

cover a range of assessment events

cater for a number of candidates

relate to different competency standards or accredited curricula

address an RPL assessment

involve the contextualisation of competency standards and the selected assessment tools, where required

incorporate consideration of reasonable adjustment strategies

include organisational arrangements

Integrated assessment means that:

this unit can be assessed alone or as part of an integrated assessment activity involving relevant units in the **TAA04 Training and Assessment Training Package**. Suggested units include but are not limited to:

TAAASS402C Assess competence

TAAASS403B Develop assessment tools

TAAASS404B Participate in assessment validation

TAADES401B Use Training Packages to meet client needs

Range Statement

The range statement relates to the unit of competency as a whole. 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/s of assessment may include:

recognising current existing competence of candidate/s

determining if competence has been achieved following learning

establishing candidate/s progress towards achievement of competence

determining language, literacy, numeracy needs of candidates/s

certifying competence through a Statement of Attainment

establishing progress towards a qualification

determining training gaps of candidate/s

measuring work performance

classifying employees/support career progression

meeting organisational requirements for work - operate equipment/develop new skills

licensing or regulatory requirements

Context of assessment/ RPL may include:

part of the enrolment process

the environment in which the assessment/RPL will be carried out, including real work/simulation

opportunities for collecting evidence in a number of situations

relationships between competency standards and evidence to support recognition of prior learning

who carries out the assessment/RPL

relationships between competency standards and work activities in the candidate's

	workplace
	relationships between competency standards and learning activities
	auspicing and partnership arrangements
	the period of time during which the assessment takes place
	apportionment of costs/fees, if applicable
	quality assurance mechanisms
Relevant people must include:	the candidate/s
	the assessor/s responsible for conducting the assessment/RPL, which may be self or other assessors
Relevant people may include:	the client, company or organisation
	team leaders, managers, supervisors
	delivery personnel
	technical/subject experts
	training and assessment coordinators
	RPL coordinators
	industry regulators
	employee and employer representatives
	members of professional associations
	Commonwealth department
	official/Centrelink personnel/caseworker
	Australian Apprenticeship Centre (AAC) personnel
Legal/organisational/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/partnership arrangements
	defined resource parameters
	mutual recognition arrangements

industrial relations systems and processes,
 awards/enterprise agreements
 Australian Quality Training Framework
 (AQTF2007)
 registration scope
 human resources policies/procedures
 legal requirements including
 anti-discrimination, equal employment, job
 role/responsibilities/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

The **assessment strategy** is a documented
 framework to guide and structure assessment
 arrangements for a vocational education and
 training qualification. In a learning and
 assessment pathway it is addressed as part of
 the learning strategy. In an assessment only
 pathway it is a separate document. The
 assessment strategy may encompass:

the identification of the competency
 standards forming the qualification and
 interpretation of the packaging rules of the
 qualification, where part of a Training
 Package
 interpretation of the competency standards as
 the benchmarks for assessment
 application of Training Package Assessment
 Guidelines, where part of a Training Package
 arrangements for RPL, including provision
 of guidance and assistance to candidates in
 gathering and evaluating evidence
 determination of assessment methods for
 identified competency standards
 selection of assessment tools for identified
 competency standards
 organisational arrangements for assessment,
 including physical and human resources,
 roles and responsibilities and partnership
 arrangements (where relevant)
 nominated quality assurance mechanisms
 identified risk management strategies

Benchmark/s for assessment/ RPL refers

the criterion against which the candidate is

to: assessed or prior learning recognised which, may be a competency standard/unit of competency, assessment criteria of course curricula, performance specifications, product specifications

Evidence is: material collected which, when matched against the specifications in the competency standards, provides proof of competency achievement

Types of evidence may include:

- direct, e.g. observation of work activities under real/simulated work conditions, examples of work products
- indirect, e.g. third party reports from a range of sources
- supplementary, e.g. question and answer, work records, training records, portfolios
- candidate gathered evidence
- assessor gathered evidence
- current/recent/historical
- combination of above

The **rules of evidence** guide the evidence collection process to ensure evidence is:

- valid, for example:
 - address the elements and Performance Criteria
 - reflect the skills and knowledge described in the relevant unit/s of competency
 - show application in the context described in the Range Statement
 - demonstrate performance skills and knowledge are applied in real/simulated workplace situations

- current, for example:
 - demonstrate the candidate's current skills and knowledge
 - comply with current standards

- sufficient, for example:
 - demonstrate competence over a period of

time

demonstrate repeatable competence

not inflate the language, literacy and numeracy requirements beyond those required in performing the work task

authentic, for example:

be the work of the candidate

be corroborated/verified

All component parts of the competency standards refers to:

Elements

Performance Criteria

Employability Skills

Range Statement including advice on:

range of contexts/conditions to be met in assessment

aspects of the Performance Criteria that can be contextualised

information which adds definition to support assessment

links to knowledge and skills

underpinning language, literacy and numeracy requirements

Evidence Guide requirements, including:

underpinning/required knowledge

underpinning/required skills and attributes

underpinning language, literacy and numeracy requirements

critical aspects of evidence to be considered/quality evidence requirements

concurrent assessment and interdependence of units

assessment methods/resources/context

dimensions of competency, which include:

task skills

task management skills
contingency management skills
job role/environment skills

requirements set out in the Assessment
Guidelines of the relevant Training
Package/s

Related documentation may include:

information from the competency standards
about the resources required for assessment,
the assessment context, appropriate
assessment methods

assessment activities identified in accredited
modules derived from the relevant
competency standards

assessment activities in Support Materials
related to the relevant competency standards

RPL policy and procedures

any requirements of OHS, legislation, codes
of practice, standards and guidelines

indicators and levels of competence of the
National Reporting System

organisational requirements for
demonstration of work performance

product specifications

direct observation, for example:

real work/real time activities at the
workplace

work activities in a simulated workplace
environment

Assessment/ RPL methods are the particular
techniques used to gather different types of
evidence and may include:

structured assessment activities, for example:

simulation exercises/role-plays

projects

assignments

presentations

activity sheets

questioning, for example:

written questions, e.g. on a computer

interviews

self-assessment

verbal questioning questionnaires

oral/written examinations (for higher AQF levels)

portfolios, for example:

collections of work samples by the candidate

product with supporting documentation

historical evidence

journal/log book

information about life experience

review of products, for example:

products as a result of a project

work samples/products

third party feedback, for example:

testimonials/reports from

employers/supervisors

evidence of training

authenticated prior achievements

interview with employer, supervisor, peers

the instruments developed from the selected assessment methods to be used for gathering evidence such as:

a profile of acceptable performance measures

templates/proformas

specific questions or activities

evidence/observation checklists

checklists for the evaluation of work samples

candidate self-assessment materials

Assessment tools contain:	the procedures, information and instructions for the assessor/candidate relating to the use of assessment instruments and assessment conditions
Selected/confirmed means:	selected on the basis that they are suitable and effective in collecting the evidence in light of the purpose and context confirmed in accordance with the assessment strategy, where appropriate
Principles of assessment are:	fairness flexibility reliability validity
Material and physical resources may include:	documents required for the assessors and candidates, including competency standards and assessment tools plant and equipment technology personal protective equipment venues for assessment adaptive technologies physical adjustments to assessment environment
Assessment plan is the overall planning document for the assessment process and may include:	the purpose and aims of the assessment the context of assessment/RPL relevant competency standards to be used as the benchmarks for assessment/RPL other assessment information/documentation identified as relevant identified personnel identified assessment methods and assessment tools possibilities for clustering units of competency for assessment purposes identified OHS hazards, including assessed risks and control strategies

material and/or physical resources required
organisational arrangements for conducting
assessment/RPL

OHS reporting requirements

any special assessment needs, e.g. personal
protective equipment requirements

outline of assessment milestones, time lines
and target dates

candidate self-assessment procedures

connections to relevant organisational plans,
policies and procedures

Relevant personnel may include:

self in such contexts as one-person/small
training and/or assessment organisation

lead assessor

training and/or assessment
supervisor/coordinator

training and/or assessment manager

Characteristics of the candidate/s may
include:

level of work experience

level and experiences of previous learning
and assessment

motivation for assessment -
personal/organisational

English language, literacy and/or numeracy
levels/needs

physical impairment or disability involving
hearing, vision, voice, mobility

intellectual impairment or disability

medical condition such as arthritis, epilepsy,
diabetes, asthma that is not obvious but may
impact on assessment

differences in learning progress

psychiatric or psychological disability

religious and spiritual observances

cultural background images/perceptions

age

gender

Reasonable adjustments and/or specific needs must not compromise the integrity of the competency standards and may include:

adjustments to the assessment process taking into account candidate's language, literacy, numeracy requirements

provision of personal support services, for example, reader, interpreter, attendant carer, scribe, member of community in attendance

use of adaptive technology or special equipment

flexible assessment sessions to allow for fatigue or administering of medication

format of assessment materials, for example, in braille, first language, use of audiotape/ videotape

adjustments to the physical environment or venue

revising proposed assessment methods/tools

considerations relating to age and/or gender,

considerations relating to cultural beliefs, traditional practices, religious observances

Contextualised means:

to change the wording of some component parts of the competency standard to reflect the immediate operating environment

Contextualisation guidelines relate to:

DEST Guidelines on Training Package Contextualisation

relevant Training Package contextualisation guidelines

Recognition of prior learning is defined as:

an assessment process that assesses an individual's non-formal and informal learning to determine the extent to which that individual has achieved the required learning outcomes, competency outcomes, or standards for entry to and/or partial or total completion of a qualification

Assessment system policies and procedures may include:

candidate selection

rationale and purpose of competency-based assessment

assessment records/data

management/information management

recognition of current

competency/recognition of prior learning/credit arrangements
assessors - needs, qualifications, maintaining currency
assessment reporting procedures
assessment appeals
candidate grievances/complaints
validation
evaluation/internal audit
costs/resourcing
access and equity/reasonable adjustment
partnership arrangements
links with human resource or industrial relations systems
links with overall quality management system

Specialist support may include:

assistance by third party - carer, interpreter
development of online assessment activities
support for remote or isolated candidates and/or assessors
support from subject matter or safety experts
advice from regulatory authorities
assessment teams/panels
support from lead assessors
advice from policy development experts

Communication strategies may include:

interviews (face-to-face or telephone)
email, memos and correspondence
meetings
video conferencing/e-based learning
focus groups
email, memos and correspondence
meetings
video conferencing/e-based learning
focus groups

Unit Sector(s)

Not applicable.

Competency Field

Assessment

TAAASS402C Assess competence

Modification History

Not applicable.

Unit Descriptor

This unit specifies the competence required to assess the competence of a candidate.

Application of the Unit

This unit addresses the competence of conducting competency assessment in accordance with a developed assessment plan. It includes assessment for recognition of prior learning (RPL) or as part of a learning and assessment pathway.

The critical focus of this unit is on interpreting the collected evidence and making a judgement of competence against the specified competency standards by applying the principles of assessment and rules of evidence. This unit also covers demonstration of the professional relationship between assessor and candidate/s and the skills needed to support this relationship.

The achievement of this unit includes interpretation of competency standards, (where competency standards are used as the benchmarks for assessment). **TAADES401B Use Training Packages to meet client needs** addresses this skill in depth.

This unit does not address the development of an assessment/RPL plan or organisation of required resources for assessment/RPL, which is addressed in **TAAASS401C Plan and organise assessment**.

The competence specified in this unit is typically required by assessors.

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

Elements and Performance Criteria

Element	Performance Criteria
1 Establish and maintain the assessment environment	1.1 The assessment/ RPL plan is interpreted and assessment system policies and procedures and organisational/ legal/ethical requirements for conducting assessment are confirmed with relevant people 1.2 The relevant benchmarks for assessment/ RPL and nominated assessment tools are accessed and interpreted to confirm the evidence to be collected and how it is to be collected 1.3 Details of the assessment/ RPL plan and the assessment process are explained, discussed and clarified with the candidate including opportunities for assessment, reasonable adjustment, re-assessment and appeals 1.4 Proposed changes to the assessment process are negotiated and agreed with the candidate, where relevant
2 Gather quality evidence	2.1 The assessment/ RPL plan is followed to guide the conduct of assessment and assessment methods and assessment tools are used to gather, organise and document evidence in a format suitable for determining competence 2.2 The principles of assessment and rules of evidence are applied in gathering quality evidence 2.3 Opportunities for evidence gathering in work activities/simulated work activities are determined with the candidate and relevant personnel

- 2.4 Opportunities for integrated assessment activities/ RPL are identified and assessment tools are modified, where required
 - 2.5 Identified assessment/ RPL system policies and procedures and organisational/legal/ethical and requirements for assessment are addressed
- 3 **Support the candidate**
 - 3.1 Candidates are **guided** in gathering their own evidence to support **recognition of prior learning**
 - 3.2 Appropriate **communication** and **interpersonal skills** are used to develop a professional relationship with the candidate which reflects sensitivity to **individual differences** and enables two-way **feedback**
 - 3.3 Decisions on reasonable adjustment/s, where applicable, are made with the candidate, based on candidate's needs and characteristics
 - 3.4 Reasonable adjustments must maintain the integrity of the relevant competency standards and provide balanced application of the principles of assessment and rules of evidence
 - 3.5 **Specialist support** is accessed, where required, in accordance with the assessment plan
 - 3.6 Any occupational health and safety (OHS) risk to person or equipment is **addressed** immediately
- 4 **Make the assessment decision**
 - 4.1 **Limitations** in obtaining and evaluating quality evidence are identified and assistance is sought, where required, from relevant people
 - 4.2 Collected evidence is examined and evaluated to ensure that it reflects the evidence required to demonstrate competency and which:
 - encompasses **all component parts of the competency standards** and the dimensions of competency (where competency standards are the benchmarks for assessment/ RPL)
 - addresses other **related documentation**
 - complies with the rules of evidence
 - 4.3 **Judgement** is used to infer whether competence has been demonstrated, based on the available

evidence

- 4.4 Relevant assessment, including RPL, system policies and procedures and organisational/legal/ethical considerations are addressed in making the assessment decision
- 4.5 Clear and constructive feedback is provided to the candidate regarding the assessment decision and a follow-up **action plan** is developed, where required
- 5 **Record and report the assessment decision**
 - 5.1 Assessment/ RPL outcomes are recorded promptly and accurately in accordance with assessment/ RPL system policies and procedures and organisational/legal/ethical requirements
 - 5.2 An **assessment report** is completed and processed in accordance with assessment system policies and procedures and organisational/legal/ethical requirements
 - 5.3 **Recommendations** for follow up action are submitted to relevant people, where required
 - 5.4 **Other relevant parties** are informed of the assessment decision where required, and in accordance with confidentiality conventions
- 6 **Review the assessment process**
 - 6.1 The assessment/ RPL process is reviewed against **criteria in consultation** with relevant people to improve and modify future assessment practice
 - 6.2 The review is documented and recorded in accordance with relevant assessment system policies and procedures and organisational/legal/ethical requirements
 - 6.3 Reflection skills are used to review and self-evaluate assessment practice

Required Skills and Knowledge

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

Required skills

analysis and interpretation skills to:

unpack competency standards

interpret assessment tools and other assessment information, including those used in RPL

identify candidate needs

make judgements based on assessing available evidence

observation skills to:

recognise candidate prior learning

determine candidate readiness for assessment

observe candidate performance

identify when candidate may need assistance throughout 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 the 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/reports of assessment outcomes in required format

communications/interpersonal skills to:

explain the assessment, including RPL process to the candidate

give clear and precise instructions

ask effective questions

provide clarification

discuss process with other relevant people

give appropriate feedback to the candidate
discuss assessment outcome with the candidate
using language appropriate to the candidate and assessment environment
establish a working relationship with the candidate
attributes including:
a willingness to guide and support candidates
capacity to encourage, accept and utilise feedback
sensitivity to individual difference and need
ethical conduct in assessment

Required knowledge

competency-based assessment covering:
vocational education and training as a competency-based system
assessment is criterion referenced/distinction to norm referenced assessment
criterion used in national VET is endorsed or accredited competency standards defining specifications for performance of work/work functions and skills/knowledge
reporting of competency-based assessment
competency standards as the basis of qualifications
the principles of competency-based assessment
the structure and application of competency standards
what are the principles of assessment and how are they applied (validity, reliability, fairness, flexibility)
what are the rules of evidence and how are they applied (valid, authentic, sufficient, current)
the range of assessment purposes and assessment contexts, including RPL
different types of assessment methods, including suitability for gathering various types of evidence; suitability for content of units; resource requirements and associated costs
what are reasonable adjustments/when are they applicable/not applicable
basic evaluation methodologies suitable for reviewing personal assessment practice
types and forms of evidence, including assessment tools that are relevant to gathering different types of evidence used in competency-based assessments, including RPL
practical knowledge of the potential barriers and processes relating to assessment tools and methods
the assessment system and assessment policies and procedures established by the industry, organisation or training authority
the RPL policies and procedures established by the organisation

cultural sensitivity and equity considerations

relevant policy, legislation, codes of practice and national standards including national Commonwealth and state/territory legislation for example:

copyright and privacy laws in terms of electronic technology

security of information

plagiarism

Training Packages/competency standards

licensing requirements

industry/workplace requirements

duty of care under common law

recording information and confidentiality requirements

anti-discrimination including equal opportunity, racial vilification and disability discrimination

workplace relations

industrial awards/enterprise agreements

OHS responsibilities associated with assessing competence such as:

requirements for reporting hazards and incidents

emergency procedures and procedures for use of relevant personal protective equipment

safe use and maintenance of relevant equipment

sources of OHS information

Evidence Guide

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

To demonstrate competence against this unit, candidates must be able to provide evidence that they can assess the competence of another individual through a process of collecting and reviewing evidence and making an informed judgement.

The evidence provided must show: how the assessment environment was established and how the candidate's needs were met; how the

units of competency were interpreted to determine the evidence requirements; how the assessment plan was followed; how the assessment tools were used in collecting evidence; the basis for the assessment decision using the rules of evidence; communication skills used to guide, support and provide feedback to the candidate during the assessment process; records and reports; and how the assessment process was reviewed.

Products that could be used as evidence include:

completed RPL/assessment tools/templates/checklists
documentation of evidence collected and assessment, including RPL decisions
feedback from candidate/assessor/supervisor/RPL coordinator
feedback to candidate with recommendations for future options
completed assessment/RPL records/reports
reviews of assessment practices and recommended changes to future practices

Processes could be used as evidence include:

how competency standards and other documents were interpreted
how assessment activities, including RPL, were scheduled
how the assessment plan was modified to meet candidate needs
how evidence was collated and evaluated against the rules of evidence

Resource implications for assessment include:

access to candidates to be assessed
access to competency standards
access to assessment materials and tools
access to suitable assessment venue/equipment
workplace documentation
access to RPL policies and procedures
access to documentation/records of candidate

to determine specific requirements
cost/time considerations
personnel requirements

The collection of quality evidence requires that:

assessment must address the scope of this unit and reflect all components of the unit, i.e. the Elements, Performance Criteria, Range Statement, Evidence Guide, Employability Skills

a range of appropriate assessment methods/evidence gathering techniques is used to determine competency

evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided

the evidence collected must relate to a number of performances assessed at different points in time and in a learning and assessment pathway these must be separated by further learning and practice

evidence collected must relate to at least one example of a RPL assessment

assessment meets the rules of evidence

a judgement of competence 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

Specific evidence requirements must include:

carrying out assessment of a number of candidates, assessed against different units of competency or accredited curricula, following the relevant assessment plan

at least one candidate must be assessed through an assessment only pathway

at least one candidate must be assessed for RPL

at least one assessment must include consideration of reasonable adjustment and the reasons for decisions and approach

all must show:

the application of different assessment methods and tools involving a range of assessment activities and events

demonstration of two-way communication and feedback

how judgement was exercised in making the assessment decision how and when assessment outcomes were recorded and reported

completion of assessment records/reports in accordance with assessment system - legal/organisational ethical requirements

how the assessment process was reviewed and the review outcomes documented

Integrated assessment means that:

this unit can be assessed alone or as part of an integrated assessment activity involving relevant units in the **TAA04 Training and Assessment Training Package**. Suggested units include but are not limited to:

TAAASS401C Plan and organise assessment

TAAASS403B Develop assessment tools

TAAASS404B Participate in assessment validation

TAADES401B Use Training Packages to meet client needs.

Range Statement

The range statement relates to the unit of competency as a whole. 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.

An **assessment/ RPL plan** is the overall planning document for the assessment process and may include:

the purpose and aims of the assessment, including RPL

the context of assessment

Assessment system policies and procedures may include:

identified personnel
relevant competency standards and other assessment documentation
relationship with RPL policy and procedures
evidence plan
identified assessment methods and assessment tools
possibilities for clustering units of competency for assessment purposes
identified OHS hazards, including assessed risks and control strategies
material/physical resources required
organisational arrangements for conducting assessment
OHS reporting requirements
any special assessment needs, e.g. personal protective equipment requirements
outline of assessment milestones, time lines and target dates
candidate self-assessment procedures
connections to relevant organisational plans, policies and procedures
candidate selection
rational and purpose of competency-based assessment
assessment records/data management/information management
recognition of prior learning
recognition of credit transfer arrangements
assessors - needs, qualifications, maintaining currency
assessment reporting procedures
assessment appeals
candidate grievances/complaints
validation
evaluation/internal audit

costs/resourcing
access and equity/reasonable adjustment
partnership arrangements
links with human resource or industrial relations systems
links with overall quality management system

Organisational/legal/ethical requirements
may include:

assessment system policies and procedures
Recognition of prior learning policies and procedures
reporting, recording and retrieval systems for assessment
licensing/legal ramifications of assessing competence
requirements of training and/or assessment organisations relating to assessment and validation
quality assurance systems
business and performance plans
collaborative/partnership arrangements
policies, procedures and programs
defined resource parameters
mutual recognition arrangements
industrial relations systems and processes, awards/enterprise agreements
Australian Quality Training Framework (AQTF2007) Essential Standards for Registration
registration scope
human resources policies/procedures
legal requirements including anti-discrimination, equal employment, job role/responsibilities/conditions
relevant industry codes of practice
confidentiality and privacy requirements of information relating to completed assessments

	OHS considerations, including: - ensuring OHS requirements are adhered to during the assessment process - identifying and reporting OHS hazards and concerns to relevant personnel
Relevant people may include:	- the candidate/s - other assessors - the client, company or organisation - team leaders, managers, supervisors - trainers/facilitators - RTO coordinators - technical/subject experts - training and assessment coordinators - industry regulators - employee and employer representatives - members of professional associations - Commonwealth department official/Centrelink staff/caseworker - Australian Apprenticeship Centre (AAC) personnel
Benchmark/s for assessment/ RPL refers to:	the criterion against which the candidate is assessed which, may be a competency standard/unit of competency, assessment criteria of course curricula, performance specifications, product specifications
Assessment tools contain both the instrument and the procedures for gathering and interpreting evidence in accordance with designated assessment methods and may include:	- the instruments to be used for gathering evidence such as: - a profile of acceptable performance measures - templates/proformas - specific questions or activities - evidence/observation checklists - checklists for the evaluation of work samples - candidate self-assessment materials - the procedures, information and instructions for the assessor/candidate relating to the use

Reasonable adjustment must not compromise the integrity of the competency standard and may include:

of assessment instruments and assessment conditions

adjustments to the assessment process taking into account candidate's language, literacy, numeracy requirements

provision of personal support services, for example, reader, interpreter, attendant carer, scribe, member of community in attendance

use of adaptive technology or special equipment

flexible assessment sessions to allow for fatigue or administering of medication

format of assessment materials, for example, in Braille, first language, use of audiotape/videotape

adjustments to the physical environment or venue

revising proposed assessment methods/tools

considerations relating to age and/or gender,

considerations relating to cultural beliefs, traditional practices, religious observances

Assessment methods are the particular techniques used to gather different types of 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/role-plays

projects

presentations

activity sheets

questioning, for example:

written questions, e.g. on a computer

interviews

self-assessment

verbal questioning
 questionnaires
 oral/written examinations (for higher AQF levels)
 portfolios, for example:
 collections of work samples by the candidate
 product with supporting documentation
 historical evidence
 journal/log book
 information about life experience

review of products, for example:
 products as a result of a project
 work samples/products

third party feedback, for example:
 testimonials/reports from
 employers/supervisors
 evidence of training
 authenticated prior achievements
 interview with employer, supervisor, peer

Principles of assessment guide the assessment process and must address:

validity
 reliability
 flexibility
 fairness

Rules of evidence are closely related to the assessment principles and provide guidance on the collection of evidence to ensure that it is:

valid
 sufficient
 authentic
 current

Quality evidence addresses the rules of evidence and must:

encompass the Performance Criteria to demonstrate achievement of the outcomes (Elements)
 reflect the skills, knowledge and attributes defined in the relevant units of competency

show application of the skills in the context described in the Range Statement

demonstrate competence over a period of time

demonstrate repeatable competence

be the work of the candidate

be able to be verified

demonstrate current skills/knowledge of the candidate

not inflate the language, literacy and numeracy requirements beyond those required in the performance of the competency

Guided means to explain to the candidate:

what is recognition of prior learning

what is assessment

what are assessment tools

how to use these tools

the rules of evidence that must be met by the evidence they provide

Recognition of prior learning is defined as:

an assessment process that assesses an individual's non-formal and informal learning to determine the extent to which that individual has achieved the required learning outcomes, competency outcomes, or standards for entry to and/or partial or total completion of a qualification.

Communication skills may include:

providing constructive and supportive feedback

using active listening

using appropriate questioning to clarify and confirm instructions for evidence gathering

accurately interpreting verbal messages

assisting candidates to paraphrase advice/instructions to the assessor

making clear and concrete presentations of options/advice

Interpersonal skills may include:

accurately interpreting non-verbal messages

	engaging in two-way interaction
	using language appropriate to candidate, assessment context and work performance addressed by competency standards
	using language and concepts appropriate to cultural differences
	using culturally inclusive and sensitive techniques
Individual differences may include:	English language, literacy and numeracy barriers
	physical impairment or disability involving hearing, vision, voice, mobility
	intellectual impairment or disability
	medical conditions such as arthritis, epilepsy, diabetes and asthma that are not obvious but may impact on assessment
	learning difficulties
	psychiatric or psychological disability
	religious and spiritual observances
	cultural images/perceptions
	age
	gender
Feedback may include:	ensuring assessment/RPL process is understood
	ensuring candidate concerns are addressed
	enabling question and answer
	confirming outcomes
	identifying further evidence to be provided
	discussing action plans
	confirming gap training needed
	information regarding available appeal processes
	suggesting improvements in evidence gathering and presentation
Specialist support may include:	assistance by third party - carer, interpreter
	support from specialist educator

	development of online assessment activities
	support for remote or isolated candidates and/or assessors
	support from subject matter or safety experts
	advice from regulatory authorities
	assessment teams/panels
	support from lead assessors
	advice from policy development experts
Addressed may include:	stopping the assessment until the OHS risk is rectified
	stopping the assessment until the equipment is fixed or replaced
Limitations may relate to:	job role and responsibilities
	meeting candidate needs
	assessment panels
	training and/or assessment organisation's quality processes
	personal competency level
	organisational, industry and national training requirements
	personal level of knowledge of competency-based assessment
	legal responsibilities
All component parts of the competency standards refers to:	Elements
	Performance Criteria
	Employability Skills
	Range Statement/range of variables, including:
	contextualisation
	link to knowledge and enterprise requirements
	focus of assessment
	underpinning language, literacy and numeracy requirements

Evidence Guide requirements, including:
underpinning/required knowledge
underpinning/required skills and attributes
underpinning language, literacy and numeracy requirements
critical aspects of evidence to be considered/quality evidence requirements
concurrent assessment and interdependence of units
assessment methods/resources/context

dimensions of competency, which include:
task skills
task management skills
contingency management skills
job role/environment skills

Related documentation may include:

Assessment Guidelines of the relevant Training Package/s
the assessment criteria of accredited modules
evidence to be collected as set out in assessment plans
definition and interpretation of evidence in developed assessment tools
RPL policies and procedures
any requirements of OHS, legislation, codes of practice, standards, guidelines
indicators and levels of competence of the National Reporting System
organisational requirements for work performance
product specifications
integrated competency assessment tool

Judgement is a two-step process and means: the decision made by the assessor on whether the evidence provided meets the principles of assessment and rules of evidence
the decision made by the assessor, based on the evidence provided and evaluated, on

	whether the candidate is competent/not yet competent
An action plan is required when the decision of not yet competent is recorded and may include:	- gap training, further learning - additional practice opportunities - additional assessment opportunities/evidence gathering opportunities - individual facilitation, where relevant - referral to specialist support
An assessment report may include:	- personal details of candidate - details of assessment/s, date, time, venue - details of assessor's summary of evidence considered and copies of assessment papers - feedback to and from the candidate - justification of decision - summary of candidate's action plan - other critical information including appeals and outcomes - sign-off by assessor and candidate - electronic/paper reports to funding bodies
Recommendations may include:	- recommendations for RPL - recommendation to support training and/or assessment in new areas of competency - recommendations in the action plan - reassessment - appeal implications
Other relevant parties may include:	- Centrelink personnel - Department of Immigration and Multicultural Indigenous Affairs (DIMIA) - parties nominated by the candidate - parties to be informed because of contractual obligations
Criteria may include:	- following the assessment plan - confirming and addressing organisational, ethical and legal requirements where appropriate, including OHS

providing appropriate information regarding the assessment process to the candidate and explaining all steps, using effective communication and interpersonal skills

demonstrated application of the rules of evidence and principles of assessment in gathering quality evidence

demonstrated support and guidance to the candidate throughout the assessment process

using assessment methods and tools appropriately to gather, organise and document evidence

applying reasonable adjustments where required/ appropriate, in consultation with relevant people

providing clear and constructive feedback to the candidate regarding the assessment decision

reviewing range of own decisions for consistency

Consultation may involve:

moderation with other assessors, training and assessment coordinators

discussions with the client, team leaders, managers, RPL Coordinators, supervisors, coaches, mentors

technical/subject experts

English language, literacy and numeracy experts

Unit Sector(s)

Not applicable.

Competency Field

Assessment

TAAASS403B Develop assessment tools

Modification History

Not applicable.

Unit Descriptor

This unit specifies the competence required to develop assessment tools.

Application of the Unit

An assessment tool is used to guide the collection of quality evidence in the assessment process. It includes the instruments for collecting evidence, based on the selected assessment methods and the procedures to be followed in conducting the assessment.

The development of effective and relevant assessment tools requires interpreting the benchmarks for assessment to determine the evidence needed to demonstrate competency. It also involves analysing the assessment context to ensure the tools will be appropriate and relevant, identifying or confirming assessment methods which most effectively address the evidence requirements, then designing and developing the assessment tool documentation.

The availability of well-designed assessment tools is essential for assessment. Both this unit and **TAAASS404B Participate in assessment validation** address reviewing assessment tools as an outcome. This review can occur as part of assessment tool development. It can also occur as part of a validation exercise which may be carried out before and after use of the assessment tool.

The achievement of this unit includes interpretation of competency standards, (where competency standards are used as the benchmarks for assessment). **TAADES401B Use Training Packages to meet client needs** addresses this skill in depth.

The competence specified in this unit is typically required by assessors, learning resource/product developers, and training and/or assessment consultants.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Determine the focus of the assessment tool	1.1 The target group of candidates and the purpose/s and context/s of assessment are identified/clarified 1.2 The relevant benchmarks for assessment are accessed and interpreted to establish the evidence required to demonstrate competency 1.3 Where competency standards form the assessment benchmark/s, all component parts of the competency standards are interpreted and, where relevant, these standards are contextualised to meet organisational legal/ ethical requirements, in accordance with contextualisation guidelines 1.4 Other related documentation is identified to inform assessment tool development
2 Determine assessment tool needs	2.1 Assessment methods are selected which will support the collection of defined evidence, taking into account the context in which the assessment will take place and meeting the principles of assessment 2.2 Nominated assessment methods enable candidates to show or support their claim for recognition of current competency 2.3 Different instruments for the selected assessment methods are considered and options for assessment activities are generated using critical thinking skills
3 Design and develop assessment tools	3.1 Specific instruments are developed to address the evidence to be collected based on devising assessment activities which:

- meet the competency standards
- reflect the principles of assessment
- incorporate principles of access and equity
- meet the rules of evidence
- provide choice, where appropriate
- are sequenced to reflect competency development in a learning and assessment pathway
- are user-friendly
- reflect the assessment environment
- are practicable

3.2 Assessment instruments are developed using appropriate:

- style and format
- language, literacy and numeracy
- sensitivity to audience diversity
- visual and aural representation
- media

3.3 Clear and specific **procedures** instructing the assessor and/or candidate on the administration and use of the instruments are defined and documented

3.4 Relevant **assessment system policy and procedures** requirements are considered and addressed including storage and retrieval needs, review and evaluation, version control procedures

4 **Review and trial assessment tools**

4.1 Draft assessment tools are checked against **evaluation criteria** and amended, where necessary

4.2 Draft assessment tools are **trialled** to validate content and applicability

4.3 **Feedback** from **relevant people** involved in trialling is collected and documented

4.4 Amendments to the final tools are made based on analysis of feedback, where required

4.5 Revised assessment tools are appropriately formatted and filed in accordance with assessment system policies and procedures and

organisational/legal/ethical requirements

Required Skills and Knowledge

Not applicable.

Evidence 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

To demonstrate competence against this unit candidates must be able to provide evidence that they have developed assessment tools that support different assessment methods and which address at least three units of competency packaged at different Australian Qualifications Framework (AQF) levels.

These tools must include the instruments for collecting evidence reflecting the principles of assessment and the rules of evidence and the related instructions to assessor/s and candidates. They must also show how the contextual needs of different environments were addressed. Evidence must also include a report on the trial and review of the assessment tools, including any proposed changes.

Evidence Requirements

Required knowledge includes:

competency-based assessment including:
vocational education and training as a competency-based system
assessment is criterion referenced/distinction to norm referenced assessment
criteria used in national VET is endorsed or accredited competency standards defining specifications for performance of work/work functions and skills/knowledge
reporting of competency-based assessment
competency standards as the basis of qualifications
the principles of competency-based assessment

the structure and application of competency standards

what is an assessment only pathway and a learning and assessment pathway

the principles of assessment and how these principles are applied in developing assessment tools

what is evidence, different types of evidence and rules of evidence

what are the different purposes of assessment

different assessment contexts and relationship with developing assessment tools

how to interpret competency standards, including components of competency and dimensions of competency

what is the meaning of contextualisation of competency standards and what are contextualisation guidelines

what are Assessment Guidelines of Training Package/s and what information in Guidelines is relevant to developing assessment tools

different assessment methods, their purposes and uses

what are assessment tools including:

what do they comprise

different types of assessment instruments and procedures

relationship to assessment methods

how tools support the assessment process

different assessment tool design for different purposes including:

styles

format

media

presentation

what is recognition of current competency -
designing an assessment tool for recognition
of current competency

evaluation methodologies appropriate to the
trial and review of assessment system tools

principles of reasonable adjustment

relevant workplace information including:

organisational policies and procedures

workplace tasks and activities

standard operating procedures

procedures for use of relevant personal
protective equipment

relevant policy, legislation, codes of practice
and national standards including
Commonwealth and state/territory legislation
for example:

copyright and privacy laws in terms of
electronic technology

security of information

plagiarism

Training Packages/competency
standards/other relevant assessment
documentation

licensing requirements

considerations of access and equity

industry/workplace requirements

duty of care under common law

recording information and confidentiality
requirements

anti-discrimination including equal
opportunity, racial vilification and disability
discrimination

workplace relations

industrial awards/enterprise agreements

relevant OHS legislation, codes of practice,
standards and guidelines that need to be

Required skills and attributes include:

reflected in the assessment tool design and content

analysis and interpretation skills to:
unpack and interpret competency standards
analyse work functions
review/evaluate the assessment tools

critical thinking skills to translate the
interpreted competency standards and other
relevant assessment information into
meaningful assessment instruments

design skills to order to develop different
assessment tool designs

research and evaluation skills to:
evaluate units of competency to determine
appropriate evidence requirements
evaluate different environments, target group
needs and special circumstances for
assessment

evaluate assessment tools on the basis of
trials and feedback

literacy and communication skills to:
read and interpret relevant information to
determine evidence requirements

give clear and precise
information/instructions

receive and interpret feedback on assessment
tools

prepare required documentation using clear
and comprehensible language; using a layout
appropriate to the audience and competency
standard as it is applied in the workplace

editing and proofreading skills to:
modify and validate assessment tools

balancing different needs and demands

	attributes, including: - capacity to think logically and clearly in order to develop tools - willingness to encourage, accept and utilise feedback
Products that could be used as evidence include:	- a plan for developing the assessment tools - draft assessment tools including instruments and related procedures - documents demonstrating version control - reports on the trialling of the assessment tools, including any proposed changes - identified amendments addressing trial/review outcomes - final assessment tools
Processes that could be used as evidence include:	- how competency standards and other documents were interpreted - how the target group was identified - why certain instruments were developed - how the assessment tools meet the components of competency for the target group and why - how the assessment tools were reviewed
Resource implications for assessment include:	- access to competency standards and other relevant assessment documentation - access to workplace documentation - access to environment and resource needs - cost/time considerations - access to assessors, candidates and appropriate assessment contexts for trial/review
The collection of quality evidence requires that:	- assessment must address the scope of this unit and reflect all components of the unit i.e. the Elements, Performance Criteria, Range Statement, Evidence Guide, Employability Skills - a range of appropriate assessment methods/evidence gathering techniques is

used to determine competency

evidence must be gathered in the workplace whenever possible. Where no workplace is available, a simulated workplace must be provided

the evidence collected must relate to a number of performances assessed at different points in time and in a learning and assessment pathway these must be separated by further learning and practice

assessment meets the rules of evidence

a judgement of competence 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

Specific evidence requirements must include:

evidence of the development and trialling of new assessment tools that support a range of different assessment methods

the tools must address at least three units of competency or accredited curricula, packaged in qualifications at different AQF levels

the processes used to trial and review the tools, including feedback obtained from relevant personnel

documentation setting out the specific instruments and procedures that have been developed

Integrated assessment means that:

This unit can be assessed alone or as part of an integrated assessment activity involving relevant units. The following units are suggested:

TAAASS401C Plan and organise assessment

TAAASS402C Assess competence

TAAASS404B Participate in assessment validation.

Range Statement

The range statement relates to the unit of competency as a whole. 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 tools contain:

the instruments to be used for gathering evidence such as:

- a profile of acceptable performance measures
- templates/proformas
- specific questions or activities
- evidence/observation checklists
- checklists for the evaluation of work samples
- candidate self-assessment materials

the procedures, information and instructions for the assessor/candidate relating to the use of assessment instruments and the conditions for assessment

Target group of candidates may be:

broadly based or specifically targeted

- drawn from range of backgrounds
- defined industry or organisation
- trade- or profession-based
- defined by training arrangement, e.g. apprenticeship
- defined by specific needs
- defined by funding body requirements such as apprentice/trainee, unemployed, English language learner

Purpose/s of assessment may be to:

recognise current existing competence of candidate/s

- determine if competence has been achieved following learning
- establish candidate/s progress towards

	achievement of competence determine language, literacy, numeracy needs of candidates/s certify competence through a Statement of Attainment establish progress towards a qualification determine training gaps of candidate/s measure work performance classify employees/support career progression
Context/s of assessment may include:	the environment in which the assessment will be carried out, including real work/simulation opportunities for collecting evidence in a number of situations who carries out the assessment relationships between competency standards and work activities in the candidate's workplace relationships between competency standards and learning activities assessment under partnership arrangements the period of time during which the assessment takes place apportionment of costs/fees, if applicable quality assurance mechanisms individual unit or integrated approaches to competency assessment
Benchmark/s for assessment refers to:	the criterion against which the candidate is assessed which, may be a competency standard/unit of competency, assessment criteria of course curricula, performance specifications, product specifications
Evidence:	is material collected which, when matched against the specifications in the competency standards, provides proof of competency achievement
All component parts of the competency	Elements

standards include:

Performance Criteria
 Employability Skills
 Range Statement including:
 contextualisation
 link to knowledge and enterprise requirements
 focus of assessment
 underpinning language, literacy and numeracy requirements
 areas of contextualisation
 any links to knowledge and enterprise requirements
 range of contexts/conditions to be met in assessment

Evidence Guide requirements, including:
 underpinning/required knowledge
 underpinning/required skills and attributes
 underpinning language, literacy and numeracy requirements
 critical aspects of evidence to be considered/quality evidence requirements
 concurrent assessment and interdependence of units
 assessment methods/resources/context
 dimensions of competency, for example:
 task skills
 task management skills
 contingency management skills
 job role/environment skills

Contextualised means:

to change the wording of some component parts of the competency standard to reflect the immediate operating environment

Organisational/legal/ethical requirements may include:

assessment system policies and procedures
 industrial relations systems and processes, awards/enterprise agreements

licensing/legal ramifications of assessing competence

reporting, recording and retrieval systems for assessment

requirements of training and/or assessment organisations relating to assessment and validation

quality assurance systems

business and performance plans

access and equity policies and procedures

collaborative/partnership arrangements

defined resource parameters

mutual recognition arrangements

Australian Quality Training Framework (AQTF) **Standards for Registered Training Organisations**, in particular Standard 8, RTO Assessment

registration scope

human resource policies/procedures and legal requirements including anti-discrimination, equal employment, job role/responsibilities/ conditions

relevant industry codes of practice

confidentiality and privacy requirements of information relating to completed assessments

OHS considerations, including:

ensuring assessment methods and tools incorporate appropriate measures to maintain the health, safety and welfare of candidates

ensuring OHS requirements and specified benchmarks are accounted for within evidence requirements and assessment materials

identifying hazards and relevant risk control procedures associated with the assessment environment

Contextualisation guidelines relate to:

DEST Guidelines on Training Package contextualisation

Related documentation may include:

relevant Training Package contextualisation guidelines

requirements set out in the Assessment Guidelines of the relevant Training Package/s

information from the competency standards about the resources required for assessment, the assessment context, appropriate assessment methods

assessment activities identified in accredited modules derived from the relevant competency standards

assessment activities in Support Materials related to the relevant competency standards

any requirements of OHS, legislation, codes of practice, standards and guidelines

indicators and levels of competence of the National Reporting System

organisational requirements for demonstration of work performance

product specifications

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/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, for example:
collections of work samples compiled by the candidate
product with supporting documentation
historical evidence
journal/log book
information about life experience

review of products, for example:
products as a result of a project
work samples/products

third party feedback, for example:
testimonials/reports from employers/supervisors
evidence of training
authenticated prior achievements
interview with employer, supervisor, peer

Principles of assessment guide the assessment process and must address:

validity
reliability
flexibility
fairness

Recognition of current competency means: the process of assessment and formal recognition by an assessor of competence currently held by a candidate which has been gained through any combination of formal, informal training and education, work experience or real life experiences

Instruments are the documented questions/assessment activities developed to support the selected assessment method/s used to collect the evidence of candidate competence

oral and written questions
observation/demonstration checklists
projects, case studies, scenarios

and may include:

- candidate self-assessment guides
- recognition portfolios
- workplace portfolios
- simulation activities
- definition of relevant workplace documents
- a profile of acceptable performance measures
- templates/proformas
- evidence/observation checklists
- checklists for the evaluation of work samples

Rules of evidence are closely related to the assessment principles and provide guidance on the collection of evidence to ensure that it is:

- valid
- sufficient
- authentic
- current

Procedures guide the application of the assessment instruments and may include:

- instructions for the candidates
- instructions for administering the assessment tool, including resources needed to conduct assessment and the context for the use of the tools
- guidance for the development or review of decision making process
- guidance on reasonable adjustments
- specified variations or restrictions on the tools
- rules for verifying assessment decisions
- OHS requirements, for example, identified hazards in the assessment environment and appropriate controls and reporting mechanisms
- information on access and equity considerations

Assessment system policies and procedures may include:

- candidate selection
- rational and purpose of competency-based assessment
- assessment records/data management/information management
- recognition of current

competency/recognition of prior learning/credit arrangements
assessors - needs, qualifications, maintaining currency
assessment reporting procedures
assessment appeals
candidate grievances/complaints
validation
evaluation/internal audit
costs/resourcing
access and equity/reasonable adjustment
partnership arrangements
links with human resource or industrial relations systems
links with overall quality management system

Evaluation criteria may include:

effectiveness and relevance to the competency standards
whether the assessment tool meets the principles of assessment
whether the assessment tool meets the rules of evidence
whether the assessment tool is appropriate to selected assessment methods
whether the assessment tool is appropriate to the target group/assessment context
whether the assessment tool provides guidance on reasonable adjustments
whether the assessment tool addresses organisational/legal/ethical requirements including OHS requirements
whether the assessment tool enables the candidate to demonstrate current competency
level of engagement and direct participation of candidates
appropriateness of language and literacy used for intended audience

clarity
simplicity/ease of use/practicability
inclusivity/avoidance of bias
guidance on reasonable adjustments
cost effectiveness

Trialled may involve:

expert review by individuals with expertise in assessment and the relevant Training Package/ accredited course or relevant benchmark
field or pilot testing with groups of assessors and candidates
review of OHS considerations
peer review by assessors in the relevant industry
workshopping with assessors and other key stakeholders in the relevant industry sector

Feedback may relate to:

reliability, flexibility, validity and fairness
relevance to workplace context
content accuracy
ease of use
cost/time effectiveness for candidates and assessors
language, literacy and numeracy requirements in terms of the relevant competencies

Relevant people may include:

managers
supervisors
technical and subject experts, including OHS, English language, literacy and numeracy specialists
training and assessment coordinators
industry regulators
union and employer representatives
members of professional associations
state/territory registering body

Unit Sector(s)

Not applicable.

Competency Field

Assessment

TAAASS404B Participate in assessment validation

Modification History

Not applicable.

Unit Descriptor

This unit specifies the competence required to participate in an assessment validation process.

Application of the Unit

Validation is a process involving assessors working in collaboration to review, compare and evaluate their assessment process and their assessment outcomes in relation to the same unit/s of competency. This includes validating assessment methods/tools, the evidence that was collected using these assessment methods/tools and the interpretation of that evidence to make a judgement of competence.

Validation forms part of the quality systems of the **training/ and/or assessment organisation** (refer to definition in the Range Statement) and is undertaken to improve the quality of the assessment process.

Validation may be undertaken prior to and post the assessment of candidates and includes validation of formative and summative assessment activities (the latter includes assessment for recognition purposes).

Validation may be an internal process involving assessors from the same training and/or assessment organisation, or it may occur as an external exercise involving assessors from different organisations.

This unit focuses on the skills and knowledge needed to participate in assessment validation. It does not address the competence of leading the validation process - that function is addressed in **TAAASS501B Lead and coordinate assessment systems and services**.

The achievement of this unit includes interpretation of competency standards (where competency standards are used as the benchmarks for assessment). **TAADES401B Use Training Packages to meet client needs** addresses this skill in depth.

Achievement of this unit requires competence in conducting assessment. Therefore **TAAASS402C Assess competence is a prerequisite/co-requisite unit**.

Interpretation of the effectiveness of the assessment plan and selected/modified assessment tools also forms part of this unit of competency. Therefore, competence in the following units is also highly recommended.

TAAASS401C Plan and organise assessment

TAAASS403B Develop assessment tools

The competence specified in this unit is typically required by assessors, lead assessors, training and/or assessment consultants.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

Elements and Performance Criteria

Element	Performance Criteria
1 Prepare for validation	1.1 The purpose, focus and context of validation is confirmed and discussed with relevant people 1.2 The approach to validation is discussed and confirmed in accordance with the defined purpose/s, context, relevant assessment system policies and procedures and organisational/legal/ethical requirements 1.3 Relevant benchmarks for assessment are analysed and the evidence needed to demonstrate that competency is collectively agreed 1.4 Any related documentation relevant to validation proceedings is identified and collectively agreed

- 1.5 **Material/s** to be used in validation sessions are obtained, read and interpreted and **validation activities** collectively agreed
- 2 **Contribute to validation process**
 - 2.1 Active participation in validation sessions and activities is demonstrated using appropriate communications skills
 - 2.2 Participation in validation sessions and activities, includes the review, comparison and evaluation of:
 - the overall assessment process
 - assessment plans
 - interpretation of competency standards or other benchmarks for assessment
 - selection and application of **assessment methods**
 - selection and use of **assessment tools**
 - the collected evidence
 - assessment decisions including the exercise of **judgement**
 - 2.3 The review, comparison and evaluation is undertaken in accordance with the **principles of assessment** and **rules of evidence**
 - 2.4 All documents used in the validation process are checked for accuracy and version control
- 3 **Contribute to validation outcomes**
 - 3.1 Validation findings are collectively discussed, analysed and agreed to support improvements in the quality of assessment
 - 3.2 **Recommendations** to improve assessment practice are discussed, agreed and recorded
 - 3.3 Changes to own assessment practice, arising from validation and appropriate to assessment role and responsibilities, are implemented

Required Skills and Knowledge

Not applicable.

Evidence 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

To demonstrate competence against this unit candidates must be able to provide evidence that they have actively participated in and have contributed to a minimum of two validation sessions, using different validation approaches and validation activities.

The evidence provided must: explain the validation purpose and context and the legal and ethical responsibilities of assessors; include the collation of documentation to be submitted to the validation process; demonstrate access and interpretation of the competency standard and evidence requirements; demonstrate communication and liaison with relevant people and participation in providing feedback and interpreting documentation in validation sessions; demonstrate how the critical aspects of validation were addressed; show involvement in reviewing findings/outcomes, including, where relevant, contributing to the finalised validation documentation.

Evidence Requirements

Required knowledge includes:

what is competency-based assessment including

vocational education and training as a competency-based system

assessment is criterion referenced/distinction to norm referenced assessment

criterion used in national VET is endorsed or accredited competency standards defining specifications for performance of work/work functions and skills/knowledge

reporting of competency-based assessment

competency standards as the basis of qualifications

the principles of competency-based assessment

the structure and application of competency standards

how to interpret competency standards and other related assessment information to determine the evidence needed to

demonstrate competency including:
the components of competency
assessment of Employability Skills,
dimensions of competency and OHS
requirements
Training Package Assessment Guidelines
the qualification level of units

Australian Qualifications Framework
Guidelines including characteristics of AQF
levels

different assessment methods and which
methods may be appropriate and relevant to
different units/ different parts of individual
units

different types of assessment tools, what
tools work for what types of evidence, what
are well constructed assessment tools and
why

what are the principles of assessment and
how they guide assessment and validation
processes

what are the rules of evidence, why are they
important, particularly in a validation context

the various reasons for carrying out
validation and the different approaches to
validation that may be appropriate:

before assessment

during assessment

after assessment

the critical aspects of validation, including
validation of:

assessment processes

methods and tools

the collected evidence leading to assessment
decisions

assessment decisions

different aspects of quality systems such as:
local/relevant strategies to meet the AQTF
continuous improvement systems
quality assurance policies and processes
Assessment system policies and procedures
records management systems

relevant policy, legislation, codes of practice
and national standards including national
Commonwealth and state/territory legislation
for example:

Training Packages/competency
standards/other assessment benchmarks
licensing requirements
providing accurate information
meeting environmental standards
industry/workplace requirements
duty of care under common law
recording information and confidentiality
requirements
anti-discrimination
workplace relations
industrial awards/enterprise agreements

relevant OHS legislation, codes of practice,
standards and guidelines, impacting on
assessment

Required skills and attributes include:

research skills to:
access and analyse relevant documents for
validation
use a range of source documents to access
information for validation

evaluation/revision skills to:
determine evidence requirements from
competency standards

review assessment process

review assessment methods and tools

review collected evidence

literacy skills to:

read and understand the documents relevant to validation

observation skills to:

evaluate and compare assessment planning, organisation, methods, tools, and evidence documentation leading to assessment judgements

identify where improvements to the assessment process can be made

communications and interpersonal skills to:

effectively participate and contribute to validation activities and sessions

collaborate with colleagues

seek and receive feedback on assessment practice

share sensitive information

maintain confidentiality of sensitive information

gain and maintain trust of colleagues

provide advice and support to colleagues

planning skills to:

participate within agreed timeframes

problem solving skills to:

identify information that is inconsistent, ambiguous or contradictory

suggest/confirm recommendations for improvements in assessment

Products that could be used as evidence

recommendations as a result of reviewing

include:	assessments, and why evaluations of the quality of assessment tools against the identified competency standards evaluations of the evidence collected against identified competency standards, and whether it meets the rules of evidence suggested recommendations discussed for modification
Processes that could be used as evidence include:	how competency standards and other documents were interpreted and evidence requirements identified how assessment decisions were evaluated how assessment feedback was collated and evaluated what contribution was made to validation activities
Resource implications for assessment include:	access to competency standards and other related assessment documentation access to completed assessment tools access to assessment reports/records access to suitable assessment validation venue/equipment access to a validation group access to relevant workplace documentation cost/time considerations meeting personnel requirements retime management
The collection of quality evidence requires that:	assessment must address the scope of this unit and reflect all components of the unit i.e. the Elements, Performance Criteria, Range Statement, Evidence Guide, Employability Skills a range of appropriate assessment methods/evidence gathering techniques is used to determine competency evidence must be gathered in the workplace whenever possible. Where no workplace is available, a simulated workplace must be

Specific evidence requirements must include:

provided

the evidence collected must relate to a number of performances assessed at different points in time and in a learning and assessment pathway these must be separated by further learning and practice

assessment meets the rules of evidence

a judgement of competence 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

active participation in a minimum of two validation sessions/meetings which, in combination, address the critical aspects of validation using different validation approaches and activities

clear explanations of the purposes of validation and the legal and ethical responsibilities of assessors

collation of all documentation relating to the validation process in a logical manner

demonstration of communications and liaison with relevant people

provision of feedback and interpretation of documentation in validation sessions

record of contribution to validation findings

Integrated assessment means that:

this unit can be assessed alone or as part of an integrated assessment activity involving relevant units in the **TAA04 Training and Assessment Training Package**.

Range Statement

The range statement relates to the unit of competency as a whole. 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.

Training and/or assessment organisation refers to:

a Registered Training Organisation (RTO), i.e. an organisation registered to provide recognised training and assessment services; includes TAFE institutes, private commercial colleges/ companies, enterprises, community organisations, group training companies and schools

an organisation working in a partnership arrangement with an RTO to provide recognised training and assessment services

an organisation that provides non-recognised training and assessment services

Purpose and focus of validation may include:

as part of organisational quality assurance processes

to address an identified area of risk in assessment practice and quality

to demonstrate compliance with the Australian Quality Training Framework (AQTF) Standards for Registered Training Organisations (RTOs)

to ensure assessments meet the evidence requirements of the competency standards or other assessment benchmarks

to provide evidence for external audit

to provide evidence for internal audit

to improve assessment practices

to evaluate the quality of assessment tools

to provide professional development

to increase assessor confidence

to determine whether different assessors using the same tools collect the same types and levels of evidence

to determine whether different assessors interpret the same evidence similarly

to determine whether assessment decisions reflect the principles of assessment and rules of evidence

Context of validation may include:	- internal to the organisation, e.g. same site or across sites - external to the organisation, e.g. in a industry, region, city, state, assessor network through licensing or similar body - with co-assessors - with peers/colleagues from other training and/or assessment organisations
Relevant people must include:	other assessor/s involved in the validation exercise
Relevant people may include:	- lead assessors - managers, supervisors - technical and subject experts, including occupational health and safety (OHS) experts and language, literacy and numeracy specialists - personnel or partners with responsibilities for input into the quality assurance system - training and/or assessment coordinators - industry clients - industry regulators - employee and employer representatives - members of professional associations - personnel from a state or territory registering body - independent validators
Approach to validation may include:	- assessment panels - moderation meetings - collectively developing/reviewing banks of assessment tools and exemplars - benchmarking - field testing, trialling and piloting assessment tools - peer review - team assessment - internal audit process

Assessment system policies and procedures may include:

client feedback mechanisms

mentoring of less experienced by more experienced assessors

use of independent assessment validator to review validation processes

candidate selection

rational and purpose of competency-based assessment

assessment records/data management/information management

recognition of current competency/recognition of prior learning/credit arrangements

assessors - needs, qualifications, maintaining currency

assessment reporting procedures

assessment appeals

candidate grievances/complaints

validation

evaluation/internal audit

costs/resourcing

access and equity/reasonable adjustment

partnership arrangements

links with human resource or industrial relations systems

links with overall quality management system

Organisational/legal/ethical requirements may include:

legal and ethical responsibilities of assessors

assessment system policies and procedures

reporting, recording and retrieval systems for assessment, including documenting the agreed approach to validation

licensing/legal ramifications of assessing competence

requirements of training and/or assessment organisations relating to assessment and validation

quality assurance systems
business and performance plans
access and equity policies and procedures
collaborative/partnership arrangements
policies, procedures and programs
defined resource parameters
mutual recognition arrangements
industrial relations systems and processes,
awards/enterprise agreements
AQTF Standards for Registered Training
Organisations (RTOs), in particular Standard
8, RTO assessment
registration scope
human resource policies/procedures and
legal requirements including
anti-discrimination, equal employment, job
role/responsibilities/conditions
relevant industry codes of practice
confidentiality and privacy requirements of
information relating to completed
assessments
OHS considerations, including:
ensuring OHS requirements are adhered to
during the assessment process
identifying and reporting OHS hazards and
concerns to relevant personnel

Benchmark/s for assessment refers to:

the criterion against which the candidate is
assessed which, may be a competency
standard/unit of competency, assessment
criteria of course curricula, performance
specifications, product specifications

Evidence:

is material collected which, when matched
against the specifications in the competency
standards, provides proof of competency
achievement

Related documentation may include:

the Assessment Guidelines of the relevant
Training Package/s
information from the competency standards
about the resources required for assessment,

the assessment context, appropriate
assessment methods
standards

assessment activities identified in accredited
modules derived from the relevant
competency

assessment activities in Support Materials
related to the relevant competency standards

any requirements of OHS, legislation, codes
of practice, standards and guidelines

indicators and levels of competence of the
National Reporting System

organisational requirements for
demonstration of work performance

product specifications

Material/s may include:

assessment tools

samples of collected evidence

documentation outlining the basis of
assessment decisions

reports/records of assessment decisions

validation templates

validation checklists

assessment exemplars and competency
standards

sampling techniques

banks of assessment tools

survey proformas

Validation activities may include:

analysing and reviewing assessment tools

analysing and reviewing collected evidence

analysing and reviewing assessment
decisions/records of assessment outcomes

examining assessment records

examining assessment systems

discussing the assessment process, issues,
difficulties in interpretation

holding interviews with each other or with

management, trainers/facilitators, candidates
analysing client feedback
observing assessment conduct
using validation tools
reviewing and interpreting Assessment
Guidelines
examining assessor qualifications
analysing appeals processes
recording evidence of validation processes
and outcomes

Assessment process is defined as:

Assessment plan is the overall planning document for the assessment process and may include:

key steps involved in the assessment cycle
the purpose and aims of the assessment
the context of assessment
relevant competency standards to be used as the benchmarks for assessment
other assessment information/documentation identified as relevant
identified personnel
identified assessment methods and assessment tools
possibilities for clustering units of competency for assessment purposes
identified OHS hazards, including assessed risks and control strategies
material and/or physical resources required
organisational arrangements for conducting assessment
OHS reporting requirements
any special assessment needs, e.g. personal protective equipment requirements
outline of assessment milestones, time lines and target dates
candidate self-assessment procedures
connections to relevant organisational plans, policies and procedures

Assessment methods are the particular

direct observation, for example:

techniques used to gather evidence and may include:

real work/real time activities at the workplace

work activities in a simulated workplace environment

structured activities, for example:

simulation exercises/role-plays

projects

presentations

activity sheets

questioning, for example:

written questions, for example, on a computer

interviews

self-assessment

verbal questioning

questionnaires

oral or written examinations (applicable at higher AQF levels)

portfolios, for example:

collections of work samples compiled by the candidate

product with supporting documentation

historical evidence

journal/log book

information about life experience

review of products, for example:

products as a result of a project

work samples/products

third party feedback, for example:

testimonials/reports from

employers/supervisors

	evidence of training authenticated prior achievements interview with employer, supervisor, peer
Assessment tools contain:	the instruments to be used for gathering evidence such as: a profile of acceptable performance measures templates/proformas specific questions or activities evidence/observation checklists checklists for the evaluation of work samples candidate self-assessment materials the procedures, information and instructions for the assessor/candidate relating to the use of assessment instruments and the conditions for assessment
Judgement is a two-step process and means:	the decision made by the assessor on whether the evidence provided meets the principles of assessment and rules of evidence the decision made by the assessor, based on the evidence provided and evaluated, on whether the candidate is competent/not yet competent
Principles of assessment are:	validity reliability flexibility fairness
Rules of evidence are:	validity sufficiency currency authenticity
Recommendations for improvement may include:	ongoing professional development strategies for assessors changes to assessment system policies and procedures

changes to assessment strategies
changes to assessment plans
changes to selected assessment methods
changes/development of new assessment tools
improved records management
changes to assessment resources
instigation of/changes to partnership arrangements
improvements to evidence collection
provision of additional information for assessors/candidates
greater advice/support/supervision of assessors
exemplars
liaison with technical experts/specialist support

Unit Sector(s)

Not applicable.

Competency Field

Assessment

TAADEL301C Provide training through instruction and demonstration of work skills

Modification History

Not applicable.

Unit Descriptor

This unit specifies the competency required to conduct individual and group instruction and demonstration of work skills.

Application of the Unit

Demonstration of work skills is typically provided by experienced workers or supervisors in the workplace. The focus of this instruction is usually on specific learner and organisation requirements, including workplace induction, learning how to operate new equipment and processes, developing new skills at work, improving efficiency and effectiveness, and meeting safety procedures. A range of delivery techniques should be used to enhance the experience for the learner.

This unit covers the skills required to provide instruction and demonstration of work skills using existing learning resources, in a safe and comfortable learning environment, and to determine the success of both the training provided and personal training performance.

The unit addresses the skills and knowledge required to organise and conduct the instruction and demonstration through a planned approach. It emphasises the training as being driven by the work process and context.

The training may be delivered to achieve competency standards/ units of competency prescribed by a Training Package, or may be delivered to meet organisational requirements.

Skills and knowledge relating to assessment are not covered in this unit. This is addressed in relevant units from the Assessment field of the **TAA04 Training and Assessment Training Package**.

This unit is not equivalent to **TAADEL401B Plan and organise group based delivery** and/or **TAADEL402B Facilitate group based learning** and cannot be assessed in place of either of these units.

This unit has been developed to support a wide range of applications across any workplace setting and therefore can be used by any organisation.

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

Elements and Performance Criteria

Element	Performance Criteria
1 Organise instruction and demonstration	1.1 Information about learner characteristics and their learning needs is gathered 1.2 A safe learning environment is confirmed 1.3 Instruction and demonstration objectives are gathered and checked and assistance is sought if required 1.4 Relevant learning resources and learning materials are accessed and reviewed for suitability and relevance and assistance sought to interpret the contextual application 1.5 Access to necessary equipment or physical resources required for instruction and demonstration is organised 1.6 Learners are engaged in the selection of the delivery techniques to be used 1.7 Learners are notified of details regarding the implementation of the learning program and/or delivery plan

- 2 **Conduct instruction and demonstration**
 - 2.1 **Interpersonal skills** are used to establish a safe and comfortable learning environment
 - 2.2 The **learning program** and/or **delivery plan** is followed to ensure all learning objectives are covered
 - 2.3 Learners are briefed on any **occupational health and safety (OHS) procedures** and requirements prior to and during training
 - 2.4 **Delivery techniques** are used to structure, pace and enhance learning
 - 2.5 **Coaching** techniques are applied to assist learning
 - 2.6 **Communication skills** are used to provide information, instruct learners and demonstrate relevant work skills
 - 2.7 Opportunities for practice are provided during instruction and through work activities
 - 2.8 Feedback on learner performance is provided and discussed to support learning
- 3 **Check training performance**
 - 3.1 **Measures** are used to ensure learners are acquiring and can use new technical/generic skills and knowledge
 - 3.2 Learner progress and outcomes are monitored in consultation with the learner
 - 3.3 The relationship between the trainer/coach and the learner is reviewed and adjusted to suit the needs of the learner
- 4 **Review personal training performance and finalise documentation**
 - 4.1 Personal performance in providing instruction and demonstration is **reflected** upon and strategies for improvement are developed.
 - 4.2 Learner records are maintained, stored and secured in accordance with legal/organisational requirements

Required Skills and Knowledge

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

Required skills

verbal and non-verbal communication techniques, for example:

ask relevant and appropriate questions

provide explanations

organise and give demonstrations

use listening skills

provide information clearly

engage, motivate and connect with learners

provide constructive feedback

implement OHS requirements, by acting and responding safely in order to:

identify hazards

conduct pre-start up checks if required

observe and interpret learner behaviour which may put people at risk

time management, for example:

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 program/plan

read and analyse learner information

skills to operate audio-visual and technical equipment

interpersonal skills to:

maintain appropriate relationships

establish trust

use appropriate body language

maintain humour

demonstrate tolerance

manage a group

observation skills to:

monitor learner acquisition of new skills/knowledge/competency requirements

assess learner communication and interaction skills with others

identify learner concerns

recognise learner readiness to take on new skills/tasks

recognising and being sensitive to individual difference and diversity, for example:

being sensitive to and valuing culture

acting without bias/discrimination

responding to individuals with particular needs

recognising the importance of religion

using equipment for demonstration

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/learning materials

training techniques which enhance learning and when to use them, e.g. using:

instruction and explanation

questioning

practice

written information

group/pair/team activities

individual activities

coaching skills

demonstration

learning principles (introductory), for example:

learning and experience are connected for meaning

adults need to know why they are learning

adults can self-evaluate

adults learn in different ways

different learning styles, (introductory), for example:

visual

audio

theoretical

activist

reflective

OHS, for example:

roles and responsibilities of key personnel in learning environment

responsibilities of learners learning environment

relevant policies and procedures including hazard identification, risk assessment, reporting requirements, safe use of equipment and emergency procedures

hazard identification and risk controls for the specific learning environment

organisational policies, systems of operation relevant to specific area of training, e.g. job roles, industrial relations 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.

Critical aspects for assessment and evidence required to demonstrate competency

Evidence of the following is essential:

a minimum of three training sessions involving demonstrating and instructing of particular work skills for different groups. Each session must address different learning objectives, a range of techniques and effective communication skills appropriate to the audience

Context of and specific resources for assessment

Assessment must ensure:

access to an actual workplace whenever possible. Where no workplace is available, a simulated workplace must be provided

assessment must be conducted at different points in time and, in a learning and assessment pathway, these must be separated by further learning and practice

Resources required include:

the necessary materials for instruction/demonstration

access to required technology for instruction/demonstration

developed learning activities

Method of assessment

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:

direct questioning combined with review of portfolios of evidence and third party workplace reports of on-the-job performance by the candidate

analysis of responses to case studies and scenarios

analysis of responses for identifying processes for checking learning achievement

learner evaluations

analysis of responses for selecting learning techniques

peer evaluations

analysis of responses to the provision of practice opportunities for learners

questioning (oral or written)

analysis of responses to reasons for selecting learning resources and their organisation

review of testimony from team members, colleagues, supervisors or managers

tests of knowledge on sources of workplace diversity

video/observation of a demonstration/instruction

This unit can be assessed alone or as part of an holistic assessment activity involving relevant units in the **TAA04 Training and Assessment Training Package** or any other Training Package. Suggested units include but are not limited to:

TAADEL403B Facilitate individual learning.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. **Bold italicised** wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Information about learner characteristics may include:

language, literacy and numeracy levels
learning styles
past learning and work experiences
specific needs
workplace culture

Safe learning environment may include:

exit requirements
personal protective equipment, if needed
safe access
use of equipment

Instruction and demonstration objectives may relate to:

competencies to be achieved
generic and/or technical skills and may be:
provided by the organisation
developed by a colleague individual/group
objectives
learning outcomes

Learning resources may be:

CDs and audio tapes
commercially available support materials for Training Packages/courses
competency standards as a learning resource
learning resources and learning materials developed under the Workplace English Language and Literacy (WELL) program
learning resources produced in languages

other than English as appropriate to learner group and workplace manuals

organisational learning resources

record/log books

references and texts

Training Package noted support materials, such as:

learner/user guides

trainer/facilitator guides

how to organise training guides

example training programs

specific case studies

professional development materials

assessment materials

videos

Learning materials may include:

handouts for learners

materials sourced from the workplace, e.g. workplace documentation, operating procedures, specifications

prepared activity sheets

prepared case studies

prepared presentations and overheads

prepared research tasks

prepared role-plays

prepared scenarios, projects, assignments

prepared task sheets

prepared topic/unit/subject information sheets

worksheets

workbooks

Delivery techniques may include:

case studies

coaching

demonstrations

discovery activities
explanations
group/pair work
problem solving
providing
opportunities to practise skills
question and answer

Details may include:

location
outcomes of instruction/demonstration
reason for instruction/demonstration
who will be attending
time of instruction/demonstration

The learning program includes:

an overview of the content to be covered in each chunk/segment of the learning program
assessment methods and tools to be used to collect evidence of competency, where assessment is required competencies or other criteria to be achieved
delivery methods for each segment of the learning program
identification of assessment points to measure learner progress
learning resources, learning materials and activities for each chunk/segment of the learning program
number and duration of training sessions/classes required and overall timelines
OHS issues to be addressed in delivery
specific learning outcomes derived from the criteria for each chunk or segment of the learning program

The delivery plan is used by the trainer/facilitator to guide and manage delivery to a group and may include:

content of sessions as specified in the session plans
individual/group learning objectives or outcomes for the segment of the learning program to be addressed
identify delivery techniques to be used to

cater for a range of learning styles
learning resources, learning materials and
learning activities to be used in sessions
number of learners and their specific support
requirements
other resource requirements
OHS considerations, including:
incident or hazard reporting
emergency procedures
timelines/duration of activities within
sessions

Interpersonal skills may include:

actively listening
adjusting personal language to suit others'
requirements
communicating clearly and effectively
engaging and motivating learners
maintaining appropriate body language
responding to learners appropriately and
individually

**Occupational health and safety (OHS)
procedures may include:**

emergency procedures
hazards and their means of control
incident reporting
use of personal protective equipment
safe working practices
safety briefing
site-specific safety rules

Coaching may encompass:

acquisition of specific job skills and
knowledge
action learning arrangements
less formal learning arrangements requiring
immediate interaction and feedback
on-the-job instruction and 'buddy' systems
relationships targeting enhanced
performance
short-term learning arrangements

Communication skills may include:

working on a one-one basis
asking clear and probing questions
communicating with learners in the learning environment and training context
providing constructive feedback
providing explanations
providing information coherently and clearly
using legible writing

Measures to ensure learners are acquiring new skills and knowledge may include:

informal review or discussion
learner surveys
on-the-job observation
peer coaching systems questioning

Personal performance may be reflected upon by:

critical questioning of personal performance
discussions with other trainers/facilitators
learner evaluations
peer assessment or feedback
personal reflection
video recording of session

Unit Sector(s)

Not applicable.

Competency Field

Delivery and Facilitation

TLIC307C Drive medium rigid vehicle

Modification History

Not applicable.

Unit Descriptor

This unit involves the skills and knowledge required to drive a medium rigid vehicle safely including systematic and efficient control of all vehicle functions, monitoring of traffic and road conditions, management of vehicle condition and performance and effective management of hazardous situations. Assessment of this unit may be undertaken within a licensing examination conducted by, or under the authority of, the relevant state/territory Road Traffic Authority.

Application of the Unit

Driving must be carried out in compliance with the licence requirements and regulations of the relevant state/territory roads and traffic authority pertaining to medium rigid vehicles.

Driving is performed with limited or minimum supervision, with limited accountability and responsibility for self and others in achieving the prescribed outcomes.

Driving involves the application of routine vehicle driving principles and procedures to maintain the safety and operation of a commercial medium rigid vehicle across a variety of driving contexts.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not applicable.

Employability Skills Information

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 competency is packaged will assist in identifying employability skill requirements.

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

Elements and Performance Criteria

Element	Performance Criteria
1 Drive the medium rigid vehicle	1.1 The medium rigid vehicle is started, steered, manoeuvred, positioned and stopped in accordance with traffic regulations and manufacturers instructions 1.2 Engine power is managed to ensure efficiency and performance and to minimise engine and transmission damage 1.3 Engine operation is maintained within the manufacturer's specified torque range and temperature through effective transmission use 1.4 Braking system of medium rigid vehicle is managed and operated to ensure effective control of the vehicle under all conditions 1.5 Driving hazards are identified and/or anticipated and avoided or controlled through defensive driving 1.6 The medium rigid vehicle is driven in reverse, maintaining visibility and achieving accurate positioning 1.7 The medium rigid vehicle is parked, shut down and secured in accordance with manufacturers specifications, traffic regulations and workplace procedures 1.8 Appropriate procedures are followed in the event of a driving emergency
2 Monitor traffic and road conditions	2.1 The most efficient route of travel is taken through monitoring and anticipation of traffic flows and conditions, road standards and other factors likely to cause delays or route deviations 2.2 Traffic and road conditions are constantly monitored and acted upon to enable safe operation

and to ensure no injury to people or damage to property, equipment, loads and facilities

3 Monitor and maintain vehicle performance

- 3.1 Vehicle performance is maintained through pre-operational inspections and checks of the vehicle
- 3.2 Performance and efficiency of vehicle operation is monitored during use
- 3.3 Defective or irregular performance or malfunctions are reported to the appropriate authority
- 3.4 Vehicle records are maintained/updated and information is processed in accordance with workplace procedures

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 road rules, regulations, permit and licence requirements of the relevant state/territory road traffic authority

Relevant OH&S and environmental procedures and regulations

Medium rigid vehicle controls, instruments and indicators and their use

Medium rigid vehicle handling procedures

Procedures to be followed in the event of a driving emergency

Engine power management and safe driving strategies

Efficient driving techniques

Workplace driving and operational instructions

Driving hazards and related defensive driving techniques

Pre-operational checks carried out on vehicle and related action

Differences between transmission types

Principles of operation of air brakes and procedures for their use

Principles of stress management when driving a vehicle

Map reading and road navigation techniques including the use of a GPS device where applicable

Factors which may cause traffic delays and diversions and related action that can be taken by a driver

Causes and effects of fatigue on drivers

Factors which increase fatigue-related accidents

Fatigue management strategies including on-road techniques

Lifestyles which promote the effective long-term management of fatigue

Required skills:

Communicate effectively with others when driving a medium rigid vehicle

Read and interpret instructions, procedures, information and signs relevant to work activities

Interpret and follow operational instructions and prioritise work

Complete documentation related to work activities

Operate electronic communication equipment to required protocol

Work collaboratively with others when driving a medium rigid vehicle

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 that may occur when driving a medium rigid vehicle in accordance with regulatory requirements and workplace procedures

Implement contingency plans for unexpected events when driving a medium rigid vehicle

Apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities

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

Monitor performance of equipment

Monitor and anticipate traffic hazards and take appropriate action

Carry out pre-operational checks on a medium rigid vehicle

Check and replenish fluids and carry out lubrication processes in the course of work activities

Evidence Guide

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

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

The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria of this unit and include demonstration of applying:

- the underpinning knowledge and skills
- 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 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/or equipment, and/or

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 appropriately simulated activities 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.

Type of vehicle includes:

all medium rigid vehicles, for example any 2-axle rigid vehicle, including truck and bus greater than 8 tonnes GVM

Driving may be carried out in typical road transport situations, including:

operations conducted at day or night
typical weather conditions
on the open road
on a private road
while at a depot, base or warehouse

	while at a client's workplace or work site
Vehicle handling procedures may include:	- starting a vehicle - steering and manoeuvring a vehicle - accelerating and braking - positioning and stopping a vehicle - reversing a vehicle - operating vehicle controls, instruments and indicators - using air brakes - using defensive driving techniques - managing engine performance
Pre-operational checks may include:	- visual check of vehicle - checking and topping up of fluid levels - checks of tyre pressures - checks of operation of vehicle lights and indicators - checks of brakes
Minor routine repairs may include:	- replacement of blown globes in vehicle lights - replacement of broken fan belt - replacement of blown fuse - replacement of door mirrors - repairs to rear tail-light lens - changing of tyres - repair of tyre punctures - replacement of broken coolant hose
Driving hazards may include (examples only):	- wet and iced roads - oil on road - animals and objects on road - fire in vehicle - leaking fuel - faulty brakes - parked vehicles on the road - faulty steering mechanism on vehicle

	pedestrians crossing the road flooded sections of road windy sections of road foggy conditions
Factors that can cause traffic delays and diversions may include:	traffic accidents flooded sections of road road damage bridge/tunnel damage road works building construction emergency situations such as bushfires, building fires, etc. road closures for special events such as marches, parades, etc. holiday traffic road closures for utility works such as electricity, water, sewerage, telecommunications, gas, etc.
Depending on the type of organisation concerned and the local terminology used, workplace procedures may include:	company procedures enterprise procedures organisational procedures established procedures
Documentation/records may include:	state/territory medium rigid vehicle driving licence requirements state/territory road rules workplace driving instructions and procedures vehicle manufacturers instructions, specifications and recommended driving procedures including preoperational checks of vehicle emergency procedures vehicle log book or record book (where required)
Applicable procedures and codes may include:	relevant state/territory roads and traffic authority driving regulations and licence

requirements pertaining to medium rigid vehicles

relevant state/territory road rules

relevant state/territory permit regulations and requirements

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

C - Driving Vehicle

TLIC407D Drive heavy rigid vehicle

Modification History

Not applicable.

Unit Descriptor

This unit involves the skills and knowledge required to drive a heavy rigid vehicle safely including systematic and efficient control of all vehicle functions, monitoring of traffic and road conditions, management of vehicle condition and performance, and effective management of hazardous situations. Assessment of this unit may be undertaken within a licensing examination conducted by, or under the authority of, the relevant state/territory Road Traffic Authority.

Application of the Unit

Driving must be carried out in compliance with the licence requirements and regulations of the relevant state/territory roads and traffic authority pertaining to heavy rigid vehicles.

Driving is performed with limited or minimum supervision, with limited accountability and responsibility for self and others in achieving the prescribed outcomes.

Driving involves the application of routine vehicle driving principles and procedures to maintain the safety and operation of a commercial heavy rigid vehicle across a variety of driving contexts.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not applicable.

Employability Skills Information

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 competency is packaged will assist in identifying employability skill requirements.

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

Elements and Performance Criteria

Element	Performance Criteria
1 Drive the heavy rigid vehicle	1.1 The heavy rigid vehicle is started, steered, manoeuvred, positioned and stopped in accordance with traffic regulations and manufacturers instructions 1.2 Engine power is managed to ensure efficiency and performance and to minimise engine and gear damage 1.3 Engine operation is maintained within the manufacturer's specified torque range and temperature through effective gear selection and smooth transition in gear changes 1.4 Braking system of heavy rigid vehicle is managed and operated to ensure effective control of the vehicle under all conditions 1.5 Driving hazards are identified and/or anticipated and avoided or controlled through defensive driving 1.6 The heavy rigid vehicle is driven in reverse, maintaining visibility and achieving accurate positioning. 1.7 The heavy rigid vehicle is parked, shut down and secured in accordance with manufacturers specifications, traffic regulations and workplace procedures 1.8 Where required, overwidth and overweight permit applications are undertaken in accordance with relevant regulatory requirements 1.9 Appropriate procedures are followed in the event of a driving emergency
2 Monitor traffic and road	2.1 The most efficient route of travel is taken through monitoring and anticipation of traffic flows and

conditions	conditions, road standards and other factors likely to cause delays or route deviations
	2.2 Traffic and road conditions are constantly monitored and acted upon to enable safe operation and ensure no injury to people or damage to property, equipment loads and facilities
3 Monitor and maintain vehicle performance	3.1 Vehicle performance is maintained through pre-operational inspections and checks of the vehicle
	3.2 Performance and efficiency of vehicle operation is monitored during use
	3.3 Defective or irregular performance or malfunctions are reported to the appropriate authority
	3.4 Vehicle records are maintained/updated and information is processed in accordance with workplace procedures

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 road rules, regulations, permit and licence requirements of the relevant state/territory road traffic authority

Relevant OH&S and environmental procedures and regulations

Heavy rigid vehicle controls, instruments and indicators and their use

Heavy rigid vehicle handling procedures

Procedures to be followed in the event of a driving emergency

Engine power management and safe driving strategies

Efficient driving techniques

Pre-operational checks carried out on heavy rigid vehicle and related action

Differences between transmission types

Principles of operation of air brakes and procedures for their use

Workplace driving and operational instructions

Driving hazards and related defensive driving techniques

Principles of stress management when driving a vehicle

Factors which may cause traffic delays and diversions and related action that can be taken by a driver

Causes and effects of fatigue on drivers

Factors which increase fatigue-related accidents

Fatigue management strategies and on-road techniques

Lifestyles which promote the effective long-term management of fatigue

Required skills:

Communicate effectively with others when driving a commercial heavy rigid vehicle

Read and interpret instructions, procedures, information and signs relevant to when the driving of a commercial heavy rigid vehicle

Interpret and follow operational instructions and prioritise work

Complete documentation related to the driving of a commercial heavy rigid vehicle

Work collaboratively with others when driving a commercial heavy rigid vehicle

Operate electronic communication equipment to required protocol

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 that may occur when driving a commercial heavy rigid vehicle in accordance with regulatory requirements and workplace procedures

Implement contingency plans for unexpected events

Apply precautions and required action to minimise, control or eliminate hazards that may exist when driving a commercial heavy rigid vehicle

Monitor and anticipate traffic hazards and take appropriate action

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

Monitor performance of the vehicle and its equipment and take appropriate action where required

Carry out pre-operational checks in the course of work activities

Evidence Guide

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

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

The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria of this unit and include demonstration of applying:

- the underpinning knowledge and skills
- 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 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/or equipment, and/or

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 appropriately simulated activities 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.

Type of vehicle includes:

all heavy rigid vehicles, for example any rigid vehicle with 3 or more axles, including trucks or buses, greater than 8 tonnes GVM

Driving may be carried out in typical road transport situations, including:

operations conducted at day or night
typical weather conditions
on the open road
on a private road
while at a depot, base or warehouse

	while at a client's workplace or work site
Vehicle handling procedures may include:	- starting a vehicle - steering and manoeuvring a vehicle - accelerating and braking - positioning and stopping a vehicle - reversing a vehicle - operating vehicle controls, instruments and indicators - using air brakes - using defensive driving techniques - managing engine performance
Pre-operational checks may include:	- visual check of vehicle - checking and topping up of fluid levels - checks of tyre pressures - checks of operation of vehicle lights and indicators - checks of brakes
Minor routine repairs may include:	- replacement of blown globes in vehicle lights - replacement of broken fan belt - replacement of blown fuse - replacement of door mirrors - repairs to rear tail-light lens - changing of tyres - repair of tyre punctures - replacement of broken coolant hose
Driving hazards may include (examples only):	- wet and iced roads - oil on road - animals and objects on road - fire in vehicle - leaking fuel - faulty brakes - parked vehicles on the road - faulty steering mechanism on vehicle

	- pedestrians crossing the road - flooded sections of road - windy sections of road - foggy conditions - work site hazards including power and service lines, buildings, structures, facilities, underground services, uneven or unstable ground and recently filled trenches, stationary and moving machinery and equipment, hazardous or dangerous materials, noise, light, energy sources, and obstructions
Factors that can cause traffic delays and diversions may include:	- traffic accidents - flooded sections of road - road damage - bridge/tunnel damage - road works - building construction - emergency situations such as bushfires, building fires, etc. - road closures for special events such as marches, parades, sporting events, etc. - holiday traffic - road closures for utility works such as electricity, water, sewerage, telecommunications, gas, etc.
Depending on the type of organisation concerned and the local terminology used, workplace procedures may include:	- company procedures - enterprise procedures - organisational procedures - established procedures
Documentation/records may include:	- state/territory heavy rigid vehicle driving licence and permit requirements - state/territory road rules - workplace driving instructions and procedures - vehicle manufacturers instructions, specifications and recommended driving

Applicable procedures and codes may include:

procedures including preoperational checks of vehicle

emergency procedures

vehicle log book or record book (where required)

relevant standards and certification requirements

quality assurance procedures

relevant state/territory roads and traffic authority driving regulations and licence/permit requirements pertaining to heavy rigid vehicles

relevant state/territory road rules

relevant state/territory permit regulations and requirements

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

C - Driving Vehicle

TLID1007C Operate a forklift

Modification History

Not applicable.

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.

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

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 competency is packaged will assist in identifying employability skill requirements.

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

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

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

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

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

The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria of this unit and include demonstration of applying:

- the underpinning knowledge and skills
- 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 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/or equipment, and/or

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 appropriately simulated activities 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

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 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
regulationsrelevant state/territory environmental
protection legislation**Unit Sector(s)**

Not applicable.

Competency Field

D - Load Handling