



Australian Government

PMC10 Manufactured Mineral Products

Release: 1.1

CONTENTS

Preliminary Information	8
Summary of AQF qualifications in this Training Package	9
Units of Competency in this Training Package and their prerequisites	9
Imported units of competency in this Training Package	13
PMC10v1.1 Summary mapping	18
Overview	23
Historical and General Information	29
Introduction to the Industry	31
Qualifications Framework	32
Qualification Pathways	39
Industry Requirements for Employability Skills	41
Competency Standards - Industry Contextualisation	43
Examples from this Training Package of Employability Skills embedded within unit components	45
Skill Sets in this Training Package	46
Employability Skills	47
Assessment Guidelines	51
Competency Standards	65
Appendices	74
PMC20110 Certificate II in Manufactured Mineral Products	90
PMC30110 Certificate III in Manufactured Mineral Products	99
PMC40110 Certificate IV in Manufactured Mineral Products	110
PMC50110 Diploma of Manufactured Mineral Products	122
PMC60110 Advanced Diploma of Manufactured Mineral Products	129
PMC70110 Vocational Graduate Certificate in Refractories Engineering	136
MSAENV272B Participate in environmentally sustainable work practices	141
MSAENV472B Implement and monitor environmentally sustainable work practices	149
MSAENV672B Develop workplace policy and procedures for environmental sustainability	158
MSAPMPER200C Work in accordance with an issued permit	166
MSAPMPER205C Enter confined space	176
MSAPMPER300C Issue work permits	188
MSS015002A Develop strategies for more sustainable use of resources	199
MSS402030A Apply cost factors to work practices	205
MSS402031A Interpret product costs in terms of customer requirements	211
MSS402040A Apply 5S procedures	218
MSS402050A Monitor process capability	226
MSS402051A Apply quality standards	233
MSS402060A Use planning software systems in operations	242
MSS402080A Undertake root cause analysis	250
MSS402081A Contribute to the application of a proactive maintenance strategy	257
MSS403002A Ensure process improvements are sustained	264
MSS403011A Facilitate implementation of competitive systems and practices	272
MSS403013A Lead team culture improvement	280
MSS403030A Improve cost factors in work practices	288
MSS403040A Facilitate and improve implementation of 5S	295
MSS403041A Facilitate breakthrough improvements	304
MSS403051A Mistake proof an operational process	312
MSS404050A Undertake process capability improvements	319
MSS404052A Apply statistics to operational processes	326

MSS404060A Facilitate the use of planning software systems in a work area or team	334
MSS404081A Undertake proactive maintenance analyses.....	341
MSS404082A Assist in implementing a proactive maintenance strategy	349
MSS405010A Manage relationships with non-customer external organisations	357
MSS405011A Manage people relationships.....	364
MSS405012A Manage workplace learning	371
MSS405040A Manage 5S system in an organisation	379
MSS405041A Implement improvement systems in an organisation	387
MSS405050A Determine and improve process capability.....	396
MSS405060A Develop the application of enterprise control systems in an organisation..	403
MSS405061A Determine and establish information collection requirements and processes	411
MSS405070A Develop and manage sustainable energy practices	418
MSS405075A Facilitate the development of a new product.....	426
MSS405081A Develop a proactive maintenance strategy	435
MSS407002A Review operations practice tools and techniques	443
MSS407007A Respond to a major non-conformance	451
MSS407012A Lead a problem solving process to determine and solve root cause	460
MSS407013A Review continuous improvement processes.....	468
PMC552002C Operate equipment to blend/mix materials	476
PMC552003C Operate grinding equipment	484
PMC552004C Prepare for production.....	491
PMC552005C Process greenware/green products	497
PMC552006C Operate an autoclave	504
PMC552007B Heat accelerate the curing of precast concrete	511
PMC552008B Operate crushing equipment.....	518
PMC552010C Operate a calcining kiln.....	525
PMC552020C Operate slip casting equipment.....	532
PMC552021C Operate manual glazing equipment.....	538
PMC552022C Prepare materials for clay and ceramic production	545
PMC552023C Finish products after firing	552
PMC552024C Hand mould products	559
PMC552030C Operate a firing kiln.....	565
PMC552031C Operate extrusion equipment.....	572
PMC552032C Operate pressing equipment	579
PMC552040C Operate glass melting process	585
PMC552041C Operate process ovens.....	593
PMC552042C Operate blown insulation equipment	601
PMC552043C Operate float forming equipment	608
PMC552044C Operate fibre forming equipment.....	615
PMC552045C Operate container forming equipment.....	622
PMC552046C Operate glass printing equipment	629
PMC552047C Operate primary annealing equipment.....	636
PMC552048C Operate glass finishing equipment.....	644
PMC552049C Operate on-line stacking and assembly equipment.....	651
PMC552050C Schedule, cut and bend reinforcement	658
PMC552051C Finish green concrete products	665
PMC552052C Cast moulded concrete products.....	672
PMC552053C Finish cured concrete products	679
PMC552054C Spin concrete pipes.....	685
PMC552055C Conduct benching operations.....	692
PMC552056B Assemble, fabricate and place reinforcement	699
PMC552057B Finish casting operation.....	705
PMC552058B Demould concrete products	711

PMC552060C Batch mix concrete.....	718
PMC552061C Deliver concrete to site.....	725
PMC552065B Prepare asphalt.....	733
PMC552070B Operate forming equipment.....	740
PMC552071B Operate wet and dry end equipment	747
PMC552072B Produce fibrous plasterboard.....	754
PMC552090B Use and maintain tools and equipment for refractory operations.....	761
PMC552091B Prepare for, install and repair refractory brickwork/blockwork.....	767
PMC552092B Prepare for and install mouldable refractory materials.....	773
PMC552093B Prepare for and cast refractory materials.....	779
PMC552094B Prepare for and apply shotcrete for installation.....	785
PMC552095B Prepare for, install and repair ceramic fibre.....	791
PMC553000C Set up and tune a process	797
PMC553010C Process raw meal into product.....	804
PMC553020C Prepare moulds and dies	811
PMC553021C Set up and tune glazing equipment.....	817
PMC553040C Set up and optimise glass forming process.....	824
PMC553041C Set up and optimise glass furnace process	834
PMC553042C Set up and optimise secondary process	842
PMC553050C Produce architectural precast concrete.....	851
PMC553051B Produce structural precast concrete.....	858
PMC553070B Design and construct moulds for fibrous plaster products.....	866
PMC553072B Model fibrous plaster products	873
PMC553080B Set up and optimise finishing process.....	880
PMC554020D Design and prepare models, moulds and dies.....	888
PMC554090B Undertake simple refractory design	895
PMC554091B Analyse refractory failures	901
PMC555030C Analyse equipment performance	907
PMC555031B Choose materials for an application	914
PMC556031C Design structural/mechanical components	920
PMC557001A Manage trials	927
PMC557090A Select refractory materials for an application.....	935
PMC557091A Design a refractory lining.....	942
PMC557092A Specify and interpret refractory tests.....	949
PMC557093A Design a refractory/ceramic component	957
PMC557094A Investigate refractory failures.....	964
PMC557095A Specify and monitor the installation of monolithic castable refractories.....	971
PMC557096A Specify and monitor the installation of block/precast refractories.....	980
PMC557097A Specify and monitor repairs to refractory installations.....	989
PMC557098A Specify refractory installation systems.....	998
PMC561072C Store materials for production.....	1005
PMC561080B Organise self.....	1011
PMC562070B Move materials	1016
PMC562071C Operate bulk materials handling equipment.....	1023
PMC562075B Maintain kiln refractory.....	1031
PMC562081B Deliver customer service	1037
PMC562083C Allocate and complete team tasks.....	1043
PMC563081C Carry out stock control.....	1049
LMTGN5004A Manage installation and commissioning of equipment and systems	1055
MEM09002B Interpret technical drawing.....	1061
MEM09003B Prepare basic engineering drawing	1067
MSAPMOHS110A Follow emergency response procedures.....	1074
MSAPMOHS200A Work safely.....	1080

MSAPMOHS300A Facilitate the implementation of OHS for a work group	1088
MSAPMOHS400A Contribute to OHS management system	1096
MSAPMOHS401A Assess risk.....	1103
MSAPMOHS503A Maintain the workplace OHS management system.....	1111
MSAPMOHS510A Manage risk.....	1118
MSAPMOPS100A Use equipment.....	1125
MSAPMOPS101A Make measurements.....	1130
MSAPMOPS200A Operate equipment.....	1136
MSAPMOPS212A Use organisation computers or data systems	1143
MSAPMOPS400A Optimise process/plant area	1150
MSAPMOPS401A Trial new process or product.....	1158
MSAPMOPS404A Co-ordinate maintenance.....	1166
MSAPMOPS405A Identify problems in fluid power system	1173
MSAPMOPS406A Identify problems in electronic control systems	1180
MSAPMPER201A Monitor and control work permits	1187
MSAPMPER202A Observe permit work	1196
MSAPMPER400A Coordinate permit process	1202
MSAPMSUP100A Apply workplace procedures	1209
MSAPMSUP101A Clean workplace or equipment.....	1215
MSAPMSUP102A Communicate in the workplace.....	1221
MSAPMSUP106A Work in a team	1226
MSAPMSUP200A Achieve work outcomes.....	1231
MSAPMSUP201A Receive or despatch goods	1238
MSAPMSUP210A Process and record information	1245
MSAPMSUP230A Monitor process operations	1251
MSAPMSUP240A Undertake minor maintenance	1257
MSAPMSUP280A Manage conflict at work.....	1264
MSAPMSUP292A Sample and test materials and product	1270
MSAPMSUP300A Identify and implement opportunities to maximise production efficiencies.....	1275
MSAPMSUP303A Identify equipment faults	1281
MSAPMSUP310A Contribute to the development of plant documentation	1288
MSAPMSUP330A Develop and adjust a production schedule	1294
MSAPMSUP382A Provide coaching/mentoring in the workplace.....	1300
MSAPMSUP390A Use structured problem solving tools.....	1306
MSL916005A Manage complex projects	1312
MSL952001A Collect routine site samples	1321
MSL973001A Perform basic tests.....	1332
MSL974005A Perform physical tests	1344
PMAOPS101C Read dials and indicators.....	1355
PMAOPS105C Select and prepare materials	1361
PMAOPS216B Operate local control system.....	1369
PMAOPS305B Operate process control systems	1377
PMAOPS402A Respond to abnormal process situations	1386
PMAOPS405B Operate complex control systems.....	1392
PMAOPS500A Optimise production systems.....	1402
PMAOPS501A Provide operational expertise to a project team	1408
PMAOPS505A Control the process during abnormal situations	1414
PMAOPS511B Determine energy transfer loads	1420
PMAOPS512B Determine mass transfer loads	1426
PMAOPS520C Manage utilities.....	1432
PMAOPS521C Plan plant shutdown.....	1439
PMAOPS522A Coordinate plant shut down	1446

PMAOPS600C Modify plant.....	1455
PMAOPS601A Debottleneck plant.....	1463
PMASUP420B Minimise environmental impact of process.....	1470
PMASUP520B Review procedures to minimise environmental impact of process.....	1477
PMBHAN103C Shift materials safely by hand	1485
PMBTECH502B Review and analyse production trials and specify retrials	1490
PSPPM402B Manage simple projects	1496
PSPPM502B Manage complex projects	1505
RIIRIS201B Conduct local risk control.....	1515
TAEASS301B Contribute to assessment.....	1522
TAEASS401B Plan assessment activities and processes.....	1529
TAEASS402B Assess competence.....	1536
TAEASS403B Participate in assessment validation.....	1544
TAEASS502B Design and develop assessment tools	1549
TAEDEL301A Provide work skill instruction.....	1557
TLIC3003A Drive medium rigid vehicle.....	1565
TLIC3004A Drive heavy rigid vehicle.....	1573
TLID2010A Operate a forklift.....	1581

Modification History

Version	Release Date	Comments
1.1	30 April 2014	ISC Upgrade Imported units updated to current versions. Refer to mapping for details.
1	16 April 2010	Initial release

Imprint Oct 24

Copyright Statement

© Commonwealth of Australia 2024.



The content of this Training Package is licensed under a Creative Commons Attribution 4.0 International Licence, with the exception of:

- the Department's logo,
- the Commonwealth Coat of Arms,
- material protected by a trademark, and
- any third party material,

More information on this CC BY licence is set out at the Creative Commons website (www.creativecommons.org.au).

Use of all or part of this content must contain the following attribution:

PMC10 Manufactured Mineral Products Release 1.1 © **Commonwealth of Australia.**

The terms of use for the Commonwealth Coat of Arms available from the Department of the Prime Minister and Cabinet's website.

Disclaimer

The content of this Training Package was prepared in consultation with Australian industry participants. It does not necessarily represent the view of the Department of Employment and Workplace Relations (Department) or any specific body. The Department does not make any representation or warranty about the accuracy, reliability, currency or completeness of any training material and you should exercise your own independent skill and judgement before you rely on it. The Department is not liable for any loss resulting from any action taken or reliance made by you on any information contained in the training material or incorporated into it by reference (including, without limitation, third party information). No responsibility is taken for any information or services which may appear on any linked websites.

Preliminary Information

Important Note to Users

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

Check the version number before commencing training or assessment

This Training Package is Version 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	MEM05
MEM09003B	Prepare basic engineering drawing	MEM05
MSS403011A	Facilitate implementation of competitive systems and practices	MSS11
MSS403013A	Lead team culture improvement	MSS11
MSS405010A	Manage relationships with non-customer external organisations	MSS11
MSS405011A	Manage people relationships	MSS11
MSS405012A	Manage workplace learning	MSS11
MSS407013A	Review continuous improvement processes	MSS11
MSS407002A	Review operations practice tools and techniques	MSS11
MSS407007A	Respond to a major non-conformance	MSS11
MSS407012A	Lead a problem solving process to determine and solve root cause	MSS11
MSS403002A	Ensure process improvements are sustained	MSS11
MSS402030A	Apply cost factors to work practices	MSS11
MSS402031A	Interpret product costs in terms of customer requirements	MSS11
MSS402040A	Apply 5S procedures	MSS11
MSS402050A	Monitor process capability	MSS11
MSS402051A	Apply quality standards	MSS11
MSS402060A	Use planning software systems in operations	MSS11
MSS402080A	Undertake root cause analysis	MSS11
MSS402081A	Contribute to the application of a proactive maintenance strategy	MSS11

MSS403030A	Improve cost factors in work practices	MSS11
MSS403040A	Facilitate and improve implementation of 5S	MSS11
MSS403041A	Facilitate breakthrough improvements	MSS11
MSS404050A	Undertake process capability improvements	MSS11
MSS403051A	Mistake proof an operational process	MSS11
MSS404052A	Apply statistics to operational processes	MSS11
MSS404060A	Facilitate the use of planning software systems in a work area or team	MSS11
MSS404081A	Undertake proactive maintenance analyses	MSS11
MSS404082A	Assist in implementing a proactive maintenance strategy	MSS11
MSS405040A	Manage 5S system in an organisation	MSS11
MSS405041A	Implement improvement systems in an organisation	MSS11
MSS405050A	Determine and improve process capability	MSS11
MSS405060A	Develop the application of enterprise control systems in an organisation	MSS11
MSS405061A	Determine and establish information collection requirements and processes	MSS11
MSS405070A	Develop and manage sustainable energy practices	MSS11
MSS405075A	Facilitate the development of a new product	MSS11
MSS405081A	Develop a proactive maintenance strategy	MSS11
MSAENV272B	Participate in environmentally sustainable work practices	MSA07
MSAENV472B	Implement and monitor environmentally sustainable work practices	MSA07
MSAENV672B	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
MSAPMPER200C	Work in accordance with an issued permit	MSA07
MSAPMPER201A	Monitor and control work permits	MSA07
MSAPMPER202A	Observe permit work	MSA07
MSAPMPER205C	Enter confined space	MSA07
MSAPMPER300C	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
RIIRIS201B	Conduct local risk control	RII09
TAEASS301B	Contribute to assessment	TAE10
TAEASS401A	Plan assessment activities and processes	TAE10
TAEASS402B	Assess competence	TAE10
TAEASS502B	Design and develop assessment tools	TAE10
TAEASS403B	Participate in assessment validation	TAE10
TAEDEL301A	Provide work skill instruction	TAE10
TLIC3003A	Drive medium rigid vehicle	TLI10
TLIC3004A	Drive heavy rigid vehicle	TLI10
TLID2010A	Operate a forklift	TLI10

PMC10v1.1 Summary mapping

Mapping of qualifications

Code	Title	Comment
PMC20110	Certificate II in Manufactured Mineral Products	Release 2 – Imported units updated to current versions. Equivalent
PMC30110	Certificate III in Manufactured Mineral Products	Release 2 – Imported units updated to current versions. Equivalent
PMC40110	Certificate IV in Manufactured Mineral Products	Release 2 – Imported units updated to current versions. Equivalent
PMC50110	Diploma of Manufactured Mineral Products	Release 2 – Imported units updated to current versions. Equivalent
PMC60110	Advanced Diploma of Manufactured Mineral Products	Release 2 – Imported units updated to current versions. Equivalent
PMC70110	Vocational Graduate Certificate in Refractories Engineering	Release 2 – Imported units updated to current versions. Equivalent

Mapping of imported units

PMC10v1 Code	Title	PMC10v1.1 Code	Title	Comment
MSACMC411A	Lead a competitive manufacturing team	MSS403011A	Facilitate implementation of competitive systems and practices	NE
MSACMC413A	Lead team culture improvement	MSS403013A	Lead team culture improvement	E
MSACMC610A	Manage relationships with	MSS405010A	Manage relationships with	E

	non-customer external organisations		non-customer external organisations	
MSACMC611A	Manage people relationships	MSS405011A	Manage people relationships	NE
MSACMC612A	Manage workplace learning	MSS405012A	Manage workplace learning	NE
MSACMG700A	Review continuous improvement processes	MSS407013A	Review continuous improvement processes	E
MSACMG702A	Review manufacturing practice tools and techniques	MSS407002A	Review operations practice tools and techniques	E
MSACMG707A	Respond to a major non-conformance	MSS407007A	Respond to a major non-conformance	E
MSACMG712A	Lead a problem solving process to determine and solve root cause	MSS407012A	Lead a problem solving process to determine and solve root cause	E
MSACMS401A	Ensure process improvements are sustained	MSS403002A	Ensure process improvements are sustained	NE
MSACMT230A	Apply cost factors to work practices	MSS402030A	Apply cost factors to work practices	E
MSACMT231A	Interpret product costs in terms of customer requirements	MSS402031A	Interpret product costs in terms of customer requirements	E
MSACMT240A	Apply 5S procedures in a manufacturing environment	MSS402040A	Apply 5S procedures	E

MSACMT250A	Monitor process capability	MSS402050A	Monitor process capability	E
MSACMT251A	Apply quality standards	MSS402051A	Apply quality standards	E
MSACMT260A	Use planning software systems in manufacturing	MSS402060A	Use planning software systems in operations	NE
MSACMT270A	Use sustainable energy practices			Not carried forward. Covered by MSAENV272B
MSACMT271A	Use sustainable environmental practices			Not carried forward. Covered by MSAENV272B
MSACMT280A	Undertake root cause analysis	MSS402080A	Undertake root cause analysis	E
MSACMT281A	Contribute to the application of a proactive maintenance strategy	MSS402081A	Contribute to the application of a proactive maintenance strategy	E
MSACMT430A	Improve cost factors in work practices	MSS403030A	Improve cost factors in work practices	E
MSACMT440A	Lead 5S in a manufacturing environment	MSS403040A	Facilitate and improve implementation of 5S	NE
MSACMT441A	Facilitate continuous improvement in manufacturing	MSS403041A	Facilitate breakthrough improvements	NE
MSACMT450A	Undertake process capability improvements	MSS404050A	Undertake process capability improvements	E

MSACMT451A	Mistake proof a production process	MSS403051A	Mistake proof an operational process	E
MSACMT452A	Apply statistics to processes in manufacturing	MSS404052A	Apply statistics to operational processes	E
MSACMT460A	Facilitate the use of planning software systems in manufacturing	MSS404060A	Facilitate the use of planning software systems in a work area or team	NE
MSACMT481A	Undertake proactive maintenance analyses	MSS404081A	Undertake proactive maintenance analyses	E
MSACMT482A	Assist in implementing a proactive maintenance strategy	MSS404082A	Assist in implementing a proactive maintenance strategy	E
MSACMT640A	Manage 5S system in a manufacturing environment	MSS405040A	Manage 5S system in an organisation	E
MSACMT641A	Implement a continuous improvement system	MSS405041A	Implement improvement systems in an organisation	NE
MSACMT650A	Determine and improve process capability	MSS405050A	Determine and improve process capability	E
MSACMT660A	Develop the application of enterprise systems in manufacturing	MSS405060A	Develop the application of enterprise control systems in an organisation	E
MSACMT661A	Determine and establish information	MSS405061A	Determine and establish information	E

	collection requirements and processes		collection requirements and processes	
MSACMT670A	Develop and manage sustainable energy practices	MSS405070A	Develop and manage sustainable energy practices	E
MSACMT671A	Develop and manage sustainable environmental practices	MSS015002A	Develop strategies for more sustainable use of resources	E
MSACMT675A	Facilitate the development of a new product	MSS405075A	Facilitate the development of a new product	E
MSACMT681A	Develop a proactive maintenance strategy	MSS405081A	Develop a proactive maintenance strategy	E
MSAENV272A	Participate in environmentally sustainable work practices	MSAENV272B	Participate in environmentally sustainable work practices	E
MSAENV472A	Implement and monitor environmentally sustainable work practices	MSAENV472B	Implement and monitor environmentally sustainable work practices	E
MSAENV672A	Develop workplace policy and procedures for sustainability	MSAENV672B	Develop workplace policy and procedures for sustainability	E
MNMC205A	Conduct local risk assessment	RIIRIS2010B	Conduct local risk control	E
MSAPMPER200B	Work in accordance with an issued permit	MSAPMPER200C	Work in accordance with an issued permit	E
MSAPMPER205B	Enter confined	MSAPMPER205C	Enter confined	E

	space		space	
MSAPMPER300B	Issue work permits	MSAPMPER300C	Issue work permits	E
TAAASS301B	Contribute to assessment	TAEASS301B	Contribute to assessment	E
TAAASS401C	Plan and organise assessment	TAEASS401B	Plan assessment activities and processes	E
TAAASS402C	Assess competence	TAEASS402B	Assess competence	E
TAAASS403B	Develop assessment tools	TAEASS502B	Design and develop assessment tools	E
TAAASS404B	Participate in assessment validation	TAEASS403B	Participate in assessment validation	E
TAADEL301C	Provide training through instruction and demonstration of work skills	TAEDEL301A	Provide work skill instruction	E
TLIC307C	Drive medium rigid vehicle	TLIC3003A	Drive medium rigid vehicle	E
TLIC407D	Drive heavy rigid vehicle	TLIC3004A	Drive heavy rigid vehicle	E
TLID1007C	Operate a forklift	TLID2010A	Operate a forklift	E

Overview

What is a Training Package?

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

Each Training Package:

- provides a consistent and reliable set of components for training, recognising and assessing people's skills, and may also have optional support materials
- enables nationally recognised qualifications to be awarded through direct assessment of workplace competencies
- encourages the development and delivery of flexible training which suits individual and industry requirements
- encourages learning and assessment in a work-related environment which leads to verifiable workplace outcomes.

How do Training Packages fit within the National Skills Framework?

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

How are Training Packages developed?

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

How do Training Packages encourage flexibility?

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

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

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

Who can deliver and assess using Training Packages?

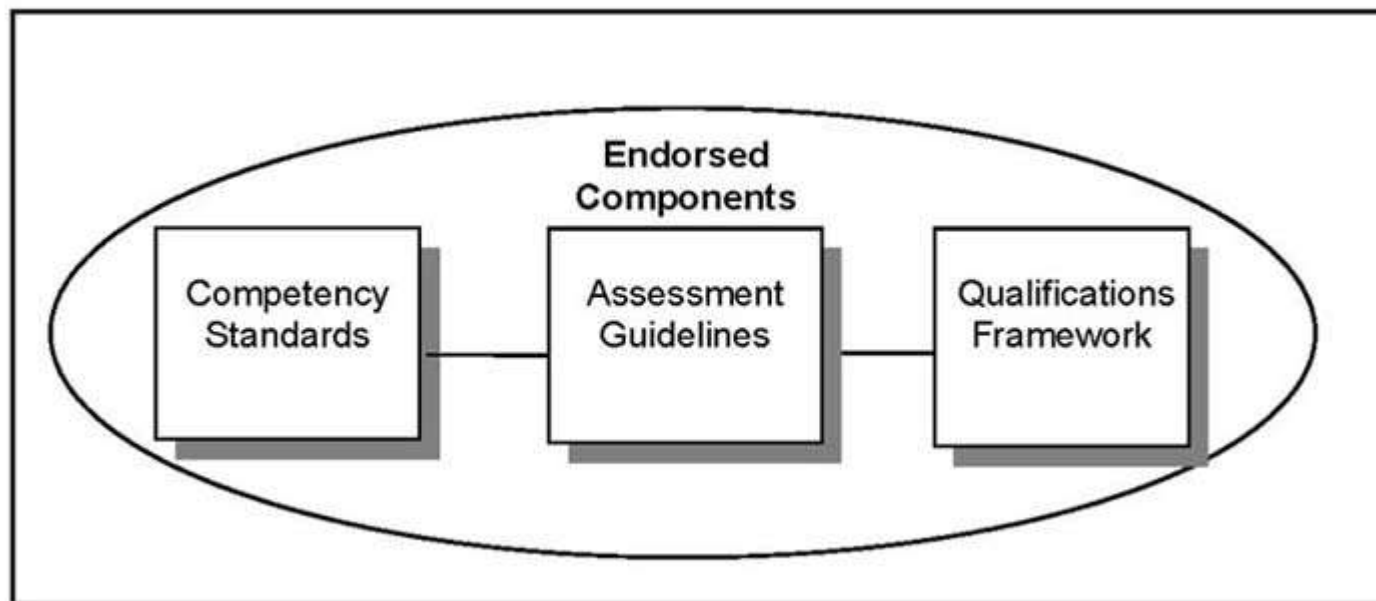
Training and assessment using Training Packages must be conducted by a Registered Training Organisation (RTO) that has the qualifications or specific units of competency on its scope of registration, or that works in partnership with another RTO, as specified in the AQTF 2007.

Training Package Components

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

Training Package Endorsed Components

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



Competency Standards

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

Assessment Guidelines

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

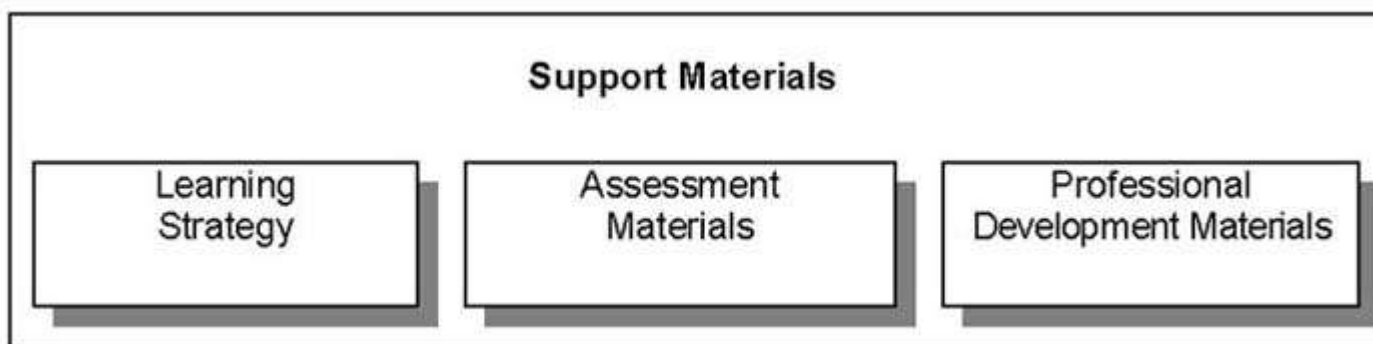
Qualifications Framework

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

Training Package Support Materials

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

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



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

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



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

Training Package, Qualification and Unit of Competency Codes

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

Training Package Codes

Each Training Package has a unique five-character national code assigned when the Training Package is endorsed, for example 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.

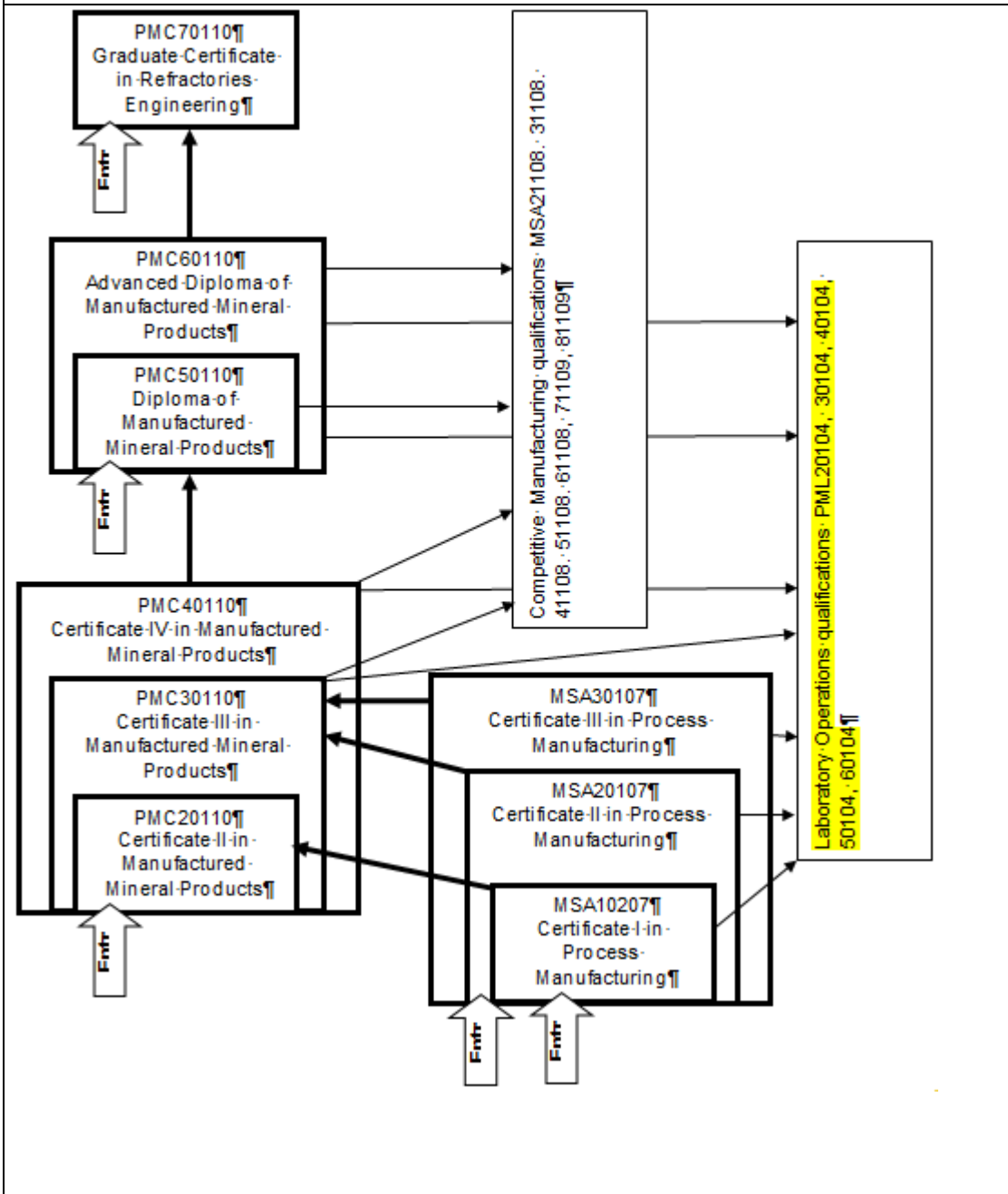
Prerequisites

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	<p>Aspects of the skill that employers identify as important. The nature and application of these facets will vary depending on industry and job type.</p> <ul style="list-style-type: none"> • listening and understanding • speaking clearly and directly
and harmonious relations across employees and customers	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • developing creative, innovative and practical solutions • showing independence and initiative in

	<p>identifying and solving problems</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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
	<ul style="list-style-type: none"> • predicting - weighing up risk, evaluating

	<p>alternatives and applying evaluation criteria</p> <ul style="list-style-type: none"> • collecting, analysing and organising information • understanding basic business systems and their relationships
Self-management that contributes to employee satisfaction and growth	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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.

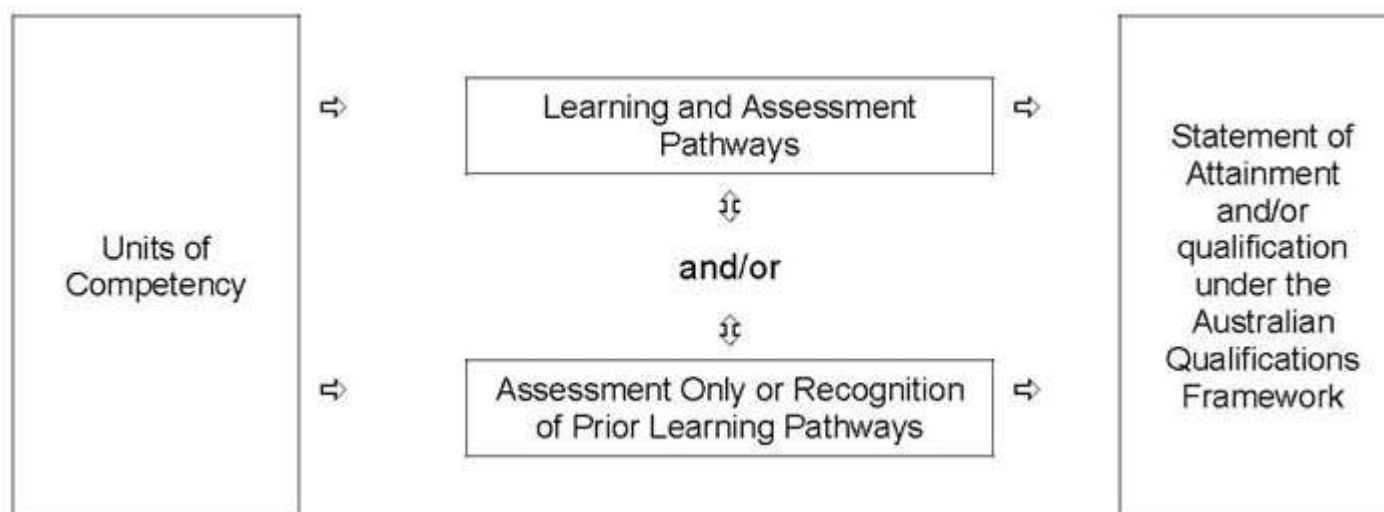
Where delivery and assessment relates to units which may have a licensing requirement the RTO may also need to satisfy the requirements of the local licensing authority.

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

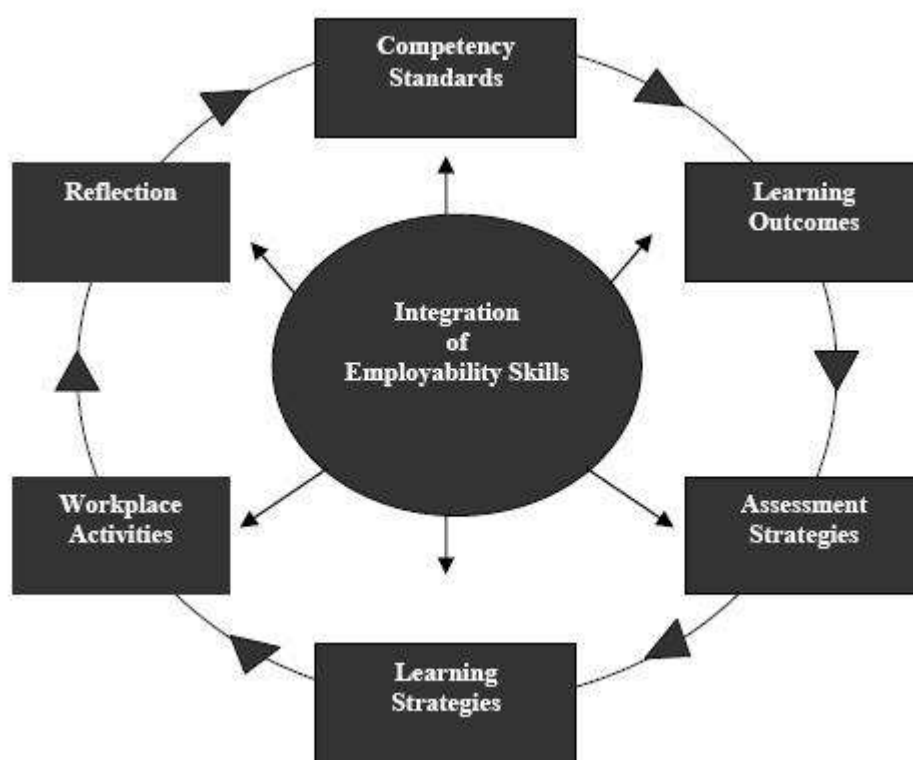
Assessments must meet the criteria set out in the AQTF 2007 Essential Standards for Registration.

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

1.5		<i>Assessment, including Recognition of Prior Learning:</i>
	a)	<i>meets the requirements of the relevant Training Package or accredited course,</i>
	b)	<i>is conducted in accordance with the principles of assessment and the rules of evidence, and</i>
	c)	<i>meets workplace and, where relevant, regulatory requirements.</i>

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.

n 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	Mayer Key Competencies
Communication	Communicating ideas and information
Teamwork	Working with others and in teams
Problem solving	Solving problems Using mathematical ideas and techniques
Initiative and enterprise	
Planning and organising	Collecting, analysing and organising information Planning and organising activities
Self-management	
Learning	
Technology	Using technology

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

Explicitly embedding Employability Skills in units of competency

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

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

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

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

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

Example Employability Skills unit

Unit component	Example of embedded Employability Skill
Unit Title	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	<p>Check quantities, type, size and shape of reinforcement supplied against drawings, tags and schedules</p> <p>(planning, organising, self management) Identify and rectify equipment failure causes</p> <p>in accordance with procedures/work instructions</p> <p>(initiative, self management, problem solving, communication)</p>

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

	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	Lasley	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

Release 2 - Imported units updated to current versions. No change in outcomes.

Release 1 - Initial release

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, MSA30208 Certificate III in Manufacturing Technology, MSS30312 Certificate III in Competitive Systems and Practices 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.

MSS20312 Certificate II in Competitive Systems and Practices 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.

Pathways Information

Not applicable.

Licensing/Regulatory Information

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.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification
Communication	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> identify and describe own role and role of others work within a team teamwork strategies
Problem solving	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> prioritise actions to achieve required outcomes plan own work requirements plan and organise activities identify tasks to achieve team goals monitor completion of allocated tasks

Self-management	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • ask questions to clarify information • identify sources of information required for job • participate in improvement procedures • participate in development of continuous improvement strategies
Technology	<ul style="list-style-type: none"> • 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
MSAENV272B	Participate in environmentally sustainable work practices	

Unit code	Title	Prerequisites
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	
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	

Unit code	Title	Prerequisites
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	
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	

Unit code	Title	Prerequisites
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 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 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
RIIRIS201B	Conduct local risk control	
MSS402030A	Apply cost factors to work practices	
MSS402031A	Interpret product costs in terms of customer requirements	
MSS402040A	Apply 5S procedures	
MSS402050A	Monitor process capability	
MSS402051A	Apply quality standards	
MSS402060A	Use planning software systems in operations	
MSS402080A	Undertake root cause analysis	
MSS402081A	Contribute to the application of a proactive maintenance strategy	
MSAPMOHS110A	Follow emergency response procedures	
MSAPMOPS100A	Use equipment	
MSAPMPER200C	Work in accordance with an issued permit	
MSAPMPER201A	Monitor and control work permits	
MSAPMPER202A	Observe permit work	
MSAPMPER205C	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	

Unit code	Title	Prerequisites
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	
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	
TLIC3003A	Drive medium rigid vehicle	
TLIC3004A	Drive heavy rigid vehicle	
TLID2010A	Operate a forklift	

Note: Only **one** of TLIC3003A **or** TLIC3004A 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

Release 2 - Imported units updated to current versions. No change in outcomes.

Release 1 - Initial release

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, MSS40312 Certificate IV in Competitive Systems and Practices 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.

MSS40312 Certificate III in Competitive Systems and Practices 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.

Pathways Information

Not applicable.

Licensing/Regulatory Information

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.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification
Communication	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> identify and describe own role and role of others work within a team resolve conflicts between team members teamwork strategies
Problem solving	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> prioritise actions to achieve required outcomes

organising	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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
MSAENV272B	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	

Unit code	Title	Prerequisites
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 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
MSAPMPER300C	Issue work permits	RIIRIS201B
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	MSAPMSUP200A
MSAPMSUP303A	Identify equipment faults	

Unit code	Title	Prerequisites
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 solving tools	
MSL973001A	Perform basic tests	
PMC563081C	Carry out stock control	
TAEASS301B	Contribute to assessment	
TAEDEL301A	Provide work skill instruction	
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
RIIRIS201B	Conduct local risk control	
MSS402030A	Apply cost factors to work practices	
MSS402031A	Interpret product costs in terms of customer requirements	
MSS402040A	Apply 5S procedures	
MSS402050A	Monitor process capability	
MSS402051A	Apply quality standards	
MSS402060A	Use planning software systems in operations	
MSS402080A	Undertake root cause analysis	
MSS402081A	Contribute to the application of a proactive maintenance strategy	

Unit code	Title	Prerequisites
MSAPMOHS110A	Follow emergency response procedures	
MSAPMOPS100A	Use equipment	
MSAPMOPS200A	Operate equipment	
MSAPMOPS212A	Use enterprise computers or data systems	
MSAPMPER200C	Work in accordance with an issued permit	
MSAPMPER201A	Monitor and control work permits	
MSAPMPER202A	Observe permit work	
MSAPMPER205C	Enter confined space	
MSAPMSUP106A	Work in a team	
MSAPMSUP200A	Achieve work outcomes	
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	
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	

Unit code	Title	Prerequisites
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	
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	

Unit code	Title	Prerequisites
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 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	

Unit code	Title	Prerequisites
PMC562071C	Operate bulk materials handling equipment	
PMC562075B	Maintain kiln refractory	
PMC562081B	Deliver customer service	
PMC562083C	Allocate and complete team tasks	
TLIC30003A	Drive medium rigid vehicle	
TLIC3004A	Drive heavy rigid vehicle	
TLID2010A	Operate a forklift	
<p>Note: Only one of TLIC3003A or TLIC3004A may be included in this qualification, not both.</p> <p>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, III or IV.</p>		

PMC40110 Certificate IV in Manufactured Mineral Products

Modification History

Release 2 - Imported units updated to current versions. No change in outcomes.

Release 1 - Initial release

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 systems and practices.

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, MSS50312 Diploma of Competitive Systems and Practices, MSA50108 Diploma of Manufacturing Technology or other relevant qualifications, including appropriate vocational graduate qualifications.

Additional qualification advice

MSS40312 Certificate IV in Competitive Systems and Practices 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.

Pathways Information

Not applicable.

Licensing/Regulatory Information

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.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification
Communication	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 recommend new and improved ways of doing things
Planning and organising	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> plan own work requirements operate within appropriate time constraints, work standards and other requirements select, use and improve appropriate equipment, materials, processes

	and procedures <ul style="list-style-type: none"> • plan to ensure effective production/projects • select and apply standard procedures • identify resource requirements • recognise limitations and seek timely advice
Learning	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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
MSAENV272B	Participate in environmentally sustainable work practices	

Unit code	Title	Prerequisites
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	

Unit Code	Title	Prerequisite unit
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
MSS403011A	Facilitate implementation of competitive systems and practices	
MSS403013A	Lead team culture improvement	
MSS403002A	Ensure process improvements are sustained	
MSS403030A	Improve cost factors in work practices	
MSS403040A	Facilitate and improve implementation of 5S	
MSS403041A	Facilitate breakthrough improvements	
MSS404050A	Undertake process capability improvements	MSS404052A
MSS403051A	Mistake proof an operational process	
MSS404052A	Apply statistics to operational processes	
MSS404060A	Facilitate the use of planning software systems in a work area or team	MSS402060A
MSS404081A	Undertake proactive maintenance analyses	
MSS404082A	Assist in implementing a proactive maintenance strategy	
MSAENV472B	Implement and monitor environmentally sustainable work practices	
MSAPMOHS400A	Contribute to OHS management system	MSAPMOHS300A MSAPMOHS200A

Unit code	Title	Prerequisites
MSAPMOHS401A	Assess risk	
MSAPMPER400A	Coordinate permit process	MSAPMPER300C
PMASUP420B	Minimise environmental impact of process	
PSPPM402B	Manage simple projects	
TAEASS401B	Plan assessment activities and processes	
TAEASS402B	Assess competence	
TAEASS502B	Design and develop assessment tools	
TAEASS403B	Participate in assessment validation	
Up to two (2) relevant units may be chosen from this Training Package, other endorsed Training Packages and accredited courses, where those units are available at Certificate IV or Diploma.		

Group B2

Unit code	Title	Prerequisites
MEM09002B	Interpret technical drawing	
RIIRIS201B	Conduct local risk control	
MSS402030A	Apply cost factors to work practices	
MSS402031A	Interpret product costs in terms of customer requirements	
MSS402040A	Apply 5S procedures	
MSS402050A	Monitor process capability	
MSS402051A	Apply quality standards	
MSS402060A	Use planning software systems in operations	
MSS402080A	Undertake root cause analysis	
MSS402081A	Contribute to the application of a proactive maintenance strategy	

Unit code	Title	Prerequisites
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	
MSAPMPER200C	Work in accordance with an issued permit	
MSAPMPER201A	Monitor and control work permits	
MSAPMPER202A	Observe permit work	
MSAPMPER205C	Enter confined space	
MSAPMPER300C	Issue work permits	RIIRIS201B
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 the workplace	

Unit code	Title	Prerequisites
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	
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	

Unit code	Title	Prerequisites
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	
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	

Unit code	Title	Prerequisites
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	
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	
PMC561072C	Store materials for production	
PMC561080B	Organise self	
PMC562070B	Move materials	

Unit code	Title	Prerequisites
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	
TAEASS301B	Contribute to assessment	
TAEDEL301A	Provide work skill instruction	
TLIC3003A	Drive medium rigid vehicle	
TLIC3004A	Drive heavy rigid vehicle	
TLID2010A	Operate a forklift	
<p>Note: Only one of TLIC3003A or TLIC3004A may be included in this qualification, not both.</p> <p>Up to six (6) relevant units may be chosen from this Training Package, other endorsed Training Packages and accredited courses, where those units are available at Certificate II, III, IV or Diploma.</p>		

PMC50110 Diploma of Manufactured Mineral Products

Modification History

Release 2 - Imported units updated to current versions. No change in outcomes.

Release 1 - Initial release

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, MSS60312 Advanced Diploma of Competitive Systems and Practices or other relevant qualifications, including appropriate vocational graduate qualifications.

Additional qualification advice

MSS50312 Diploma of Competitive Systems and Practices 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.

Pathways Information

Not applicable.

Licensing/Regulatory Information

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.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification
Communication	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> prioritise actions to achieve required outcomes plan own work requirements and assist others to plan 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	<ul style="list-style-type: none"> plan own work requirements operate within appropriate time constraints, work standards and other requirements select, use and improve appropriate equipment, materials, processes

	and procedures <ul style="list-style-type: none"> • plan to ensure effective production/projects • select and apply standard procedures • identify resource requirements • recognise limitations and seek timely advice
Learning	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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
-----------	-------	---------------

Unit code	Title	Prerequisites
MSAENV272B	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	
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	
MEM09002B	Interpret technical drawing	
MEM09003B	Prepare basic engineering drawing	MEM09002B
MSS405010A	Manage relationships with non-customer external organisations	
MSS405011A	Manage people relationships	
MSS405012A	Manage workplace learning	
MSS404052A	Apply statistics to operational processes	
MSS404081A	Undertake proactive maintenance analyses	
MSS404082A	Assist in implementing a proactive maintenance strategy	
MSS405040A	Manage 5S system in an organisation	
MSS405041A	Implement improvement systems in an organisation	
MSS405050A	Determine and improve process capability	MSS404052A
MSS405060A	Develop the application of enterprise systems in an organisation	
MSS405061A	Determine and establish information collection requirements and processes	
MSS405070A	Develop and manage sustainable energy practices	
MSS015002A	Develop strategies for more sustainable use of resources	
MSS405081A	Develop a proactive maintenance strategy	

Unit code	Title	Prerequisites
MSAENV472B	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

Release 2 - Imported units updated to current versions. No change in outcomes.

Release 1 - Initial release

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, MSS60312 Advanced Diploma of Competitive Systems and Practices or other relevant qualifications, including appropriate vocational graduate qualifications.

Additional qualification advice

MSS60312 Advanced Diploma of Competitive Systems and Practices 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.

Pathways Information

Not applicable.

Licensing/Regulatory Information

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.

Entry Requirements

Not applicable.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification
Communication	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> prioritise actions to achieve required outcomes plan own work requirements and assist others to plan 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	<ul style="list-style-type: none"> plan own work requirements operate within appropriate time constraints, work standards and other requirements select, use and improve appropriate equipment, materials, processes

	and procedures <ul style="list-style-type: none"> • plan to ensure effective production/projects • select and apply standard procedures • identify resource requirements • recognise limitations and seek timely advice
Learning	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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
MSAENV272B	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
MSS405075A	Facilitate the development of a new product	MSS404052A
PMAOPS600C	Modify plant	
PMAOPS601A	Debottleneck plant	
PMC556031C	Design structural/mechanical components	PMC555031B

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	

Unit code	Title	Prerequisites
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	
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
MSS405010A	Manage relationships with non-customer external organisations	
MSS405011A	Manage people relationships	
MSS405012A	Manage workplace learning	
MSS404052A	Apply statistics to operational process	
MSS404081A	Undertake proactive maintenance analyses	
MSS404082A	Assist in implementing a proactive maintenance strategy	

Unit code	Title	Prerequisites
MSS405040A	Manage 5S system in an organisation	
MSS405041A	Implement improvement systems in an organisation	
MSS405050A	Determine and improve process capability	MSS404052A
MSS405060A	Develop the application of enterprise control systems in an organisation	
MSS405061A	Determine and establish information collection requirements and processes	
MSS405070A	Develop and manage sustainable energy practices	
MSS015002A	Develop strategies for more sustainable use of resources	
MSS405081A	Develop a proactive maintenance strategy	
MSAENV672B	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 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

Release 2 - Imported units updated to current versions. No change in outcomes.

Release 1 - Initial release

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.
-

Pathways Information

Not applicable.

Licensing/Regulatory Information

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.

Entry Requirements

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.

Employability Skills Summary

Employability Skill	Industry/enterprise requirements for this qualification
Communication	<ul style="list-style-type: none">• communicate technically with both technicians and customers

	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> identify and define problems apply knowledge of materials, product purpose and processes suggest solutions to problems clarify and address potential issues
Initiative and enterprise	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> operate within appropriate time constraints and work standards select and use appropriate equipment, materials, processes and procedures identify resource requirements, document and monitor
Learning	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> use testing equipment

	<ul style="list-style-type: none"> • 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	
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	

Unit code	Title	Prerequisites
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
MSS407013A	Review continuous improvement processes	
MSS407002A	Review operations practice tools and techniques	
MSS407007A	Respond to a major non-conformance	
MSS407012A	Lead a problem solving process to determine and solve root cause	
MSAENV672B	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.		

MSAENV272B Participate in environmentally sustainable work practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	<p>This competency covers the outcomes required to effectively measure current resource use and carry out improvements including those reducing negative environmental impacts of work practices.</p> <p>This unit is based on the sustainability guideline standard GCSSUS01A Participate in environmentally sustainable work practices.</p>
------------------------	---

Application of the Unit

Application of the unit	<p>This competency applies to operators/team members who are required to follow procedures so as to work in an environmentally sustainable manner. This ensures regulatory compliance and also aims at minimising environmental risks and maximises the environmental performance of the process and the organisation.</p> <p>It includes:</p> <ul style="list-style-type: none">• Resources used• Potential environmental hazards• Improving environmental performance (within scope of competency and authority). <p>This competency applies to all sectors of the manufacturing industry and members of its value chain. It may also be applied to all sections of an organisation, including office, warehouse etc. This unit will need to be appropriately contextualised as it is applied across an</p>
--------------------------------	---

	organisation and across different industry sectors.
--	---

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has no prerequisites	

Employability Skills Information

Employability skills	This unit contains employability skills.
-----------------------------	--

Elements and Performance Criteria Pre-Content

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

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify current resource use and environmental issues.	1.1. Identify workplace <i>environmental and resource efficiency issues</i> . 1.2. Identify resources used in own work role. 1.3. <i>Measure</i> and record current usage of resources using <i>appropriate techniques</i> .

ELEMENT	PERFORMANCE CRITERIA
	1.4. Identify and report workplace environmental hazards to appropriate personnel.
2. Comply with environmental regulations.	2.1. Follow <i>procedures</i> to ensure <i>compliance</i> . 2.2. Report environmental incidents to appropriate personnel.
3. Seek opportunities to improve environmental practices and resource efficiency.	3.1. Follow <i>enterprise plans</i> to improve environmental practices and resource efficiency. 3.2. Make <i>suggestions</i> for improvements to workplace practices in own work area.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include the ability to:

- report as required by procedures
- follow procedures and instructions and respond to change
- ask questions and seek clarifications relating to work requirements

Reading and writing is required in order to interpret required procedures and complete required workplace forms/reports.

Numeracy is required to interpret numeric workplace information, readings and measurements, handle data as required and complete numeric components of workplace forms/reports.

Required knowledge

Competency includes sufficient knowledge to:

- have a basic understanding of sustainability
- know the environmental hazards/risks, resource use and inefficiencies associated with own workplace (at an appropriate level)
- know the relevant environmental and resource efficiency systems and procedures for own work area
- know the impact of laws and regulations to a level relevant to the work context

Evidence Guide

EVIDENCE GUIDE

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

Overview of assessment

A person who demonstrates competence in this unit must be able to provide evidence of the ability to follow workplace procedures according to instructions given and to participate in the improvement of environmental and resource efficient work practices at own level of responsibility. Evidence must be strictly relevant to the particular workplace role.

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

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- identify and measure resources used in their job
- identify situations likely to lead to an environmental incident
- follow procedures related to environmental performance.

Consistent performance should be demonstrated. For example, look to see that:

- work is routinely to procedures
- the minimum of resources is used consistent with the job requirements, good practice and the procedures.

Context of and specific resources for assessment

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Depending on the selected methods of assessment access may be required to:

- workplace procedures and plans
- documentation in relation to production, waste, overheads, hazard control/management
- reports from supervisors/managers
- case study/scenarios

Method of assessment

A holistic approach should be taken to the assessment.

Competence in this unit may be assessed:

- by demonstration in the workplace

EVIDENCE GUIDE	
	<ul style="list-style-type: none"> • using targeted questioning for appropriate portions • by use of a suitable simulation and/or a range of case studies/scenarios • by a combination of these techniques. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment.</p>
Guidance information for assessment	Assessors need to be aware of any cultural issues that may affect responses to questions. Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with procedures including all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.
Environmental and resource efficiency issues	<p>Environmental and resource efficiency issues include minimisation of environmental risks and maximisation of opportunities to improve business environmental performance and to promote more efficient production and consumption of natural resources, for example by:</p> <ul style="list-style-type: none"> • minimisation of waste, through implementation of the waste management hierarchy

RANGE STATEMENT	
	<ul style="list-style-type: none"> • efficient and effective use of energy and other resources • seeking alternative sources of energy • efficient use of materials and appropriate disposal of waste • use of controls to minimise the risk of environmental damage from hazardous substances • efficient water use • reducing emissions • life cycle analysis applied to issues such as energy supply, materials, transport, production
Measure	<p>Measure should be interpreted in a manner consistent with the scope of the job and may include things like:</p> <ul style="list-style-type: none"> • counting the number of items entering/leaving a work area • reading indicators in the work area • obtaining relevant information from support personnel • other simple means
Appropriate techniques	<p>Appropriate techniques include:</p> <ul style="list-style-type: none"> • material fed to/consumed by plant/equipment • plant meters and gauges • job cards including kanbans • examination of invoices from suppliers • measurements made under different conditions • examination of relevant information and data.
Compliance	<p>Compliance includes meeting relevant federal, state and local government laws, by-laws, regulations and mandated codes of practice. It also includes any codes and standards that the enterprise applies voluntarily.</p>
Incidents	<p>Incidents include:</p> <ul style="list-style-type: none"> • breaches or potential breaches of regulations • occurrences outside of standard procedure which may lead to lower environmental performance.
Enterprise plans	<p>Enterprise plans include:</p>

RANGE STATEMENT	
	<ul style="list-style-type: none"> • documented policies and procedures • work plans to minimise waste, increase efficiency of water/energy use, minimise environmental hazards
Suggestions	<p>Suggestions include ideas that help to:</p> <ul style="list-style-type: none"> • prevent and minimise environmental risks and maximise opportunities • reduce emissions of greenhouse gases • reduce use of non-renewable resources • improve energy efficiency • increase use of renewable, recyclable, reusable and recoverable resources • reduce waste • increasing the reusability/recyclability of wastes/products • reduce water usage and/or water wastage.

Unit Sector(s)

Unit sector	
--------------------	--

Competency field

Competency field	Competitive manufacturing tools
-------------------------	---------------------------------

Co-requisite units

Co-requisite units		

MSAENV472B Implement and monitor environmentally sustainable work practices

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	<p>This competency covers the outcomes required to effectively analyse the workplace in relation to environmentally sustainable work practices and to implement improvements and monitor their effectiveness.</p> <p>This unit is based on the sustainability guideline standard GCSSUS02A Implement and monitor environmentally sustainable work practices.</p>
------------------------	--

Application of the Unit

Application of the unit	<p>This competency applies to those who have responsibility for a specific area of work or who lead a work group or team. It addresses the knowledge, processes and techniques necessary to implement and monitor environmentally sustainable work practices, including the development of processes and tools.</p> <p>It includes:</p> <ul style="list-style-type: none">• Identifying areas for improvement• Developing plans to make improvements• Implementing and monitoring improvements in environmental performance. <p>This competency applies to all sectors of the manufacturing industry and members of its value chain. It may also be applied to all sections of an organisation, including office, warehouse etc. This unit will need to be appropriately contextualised as it is applied across an organisation and across different industry sectors.</p>
--------------------------------	--

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has no prerequisites	

Employability Skills Information

Employability skills	This unit contains employability skills.
-----------------------------	--

Elements and Performance Criteria Pre-Content

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

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Investigate current practices in relation to resource usage.	1.1 Identify environmental regulations applying to the enterprise. 1.2 Assess procedures for assessing <i>compliance</i> with environmental regulations. 1.3 Collect information on environmental and resource efficiency systems and procedures, and provide to the work group where appropriate. 1.4 Measure and record current resource usage by members of the work group.

ELEMENT	PERFORMANCE CRITERIA
	1.5 Analyse and record current purchasing strategies. 1.6 Analyse current work processes to access information and data and assist in identifying areas for improvement.
2. Set targets for improvements.	2.1 Seek input from stakeholders, key personnel and specialists. 2.2 Access external sources of information and data as required. 2.3 Evaluate alternative solutions to workplace environmental issues. 2.4 Set efficiency targets.
3. Implement performance improvement strategies.	3.1 Source <i>techniques/tools</i> to assist in achieving targets. 3.2 Apply continuous improvement strategies to own work area of responsibility and communicate ideas and possible solutions to the work group and management. 3.3 Integrate environmental and resource efficiency improvement plans for own work group with other operational activities and implement them. 3.4 Seek suggestions and ideas about environmental and resource efficiency management from stakeholders and act upon them where appropriate. 3.5 Implement costing strategies to fully value environmental assets.
4. Monitor performance.	4.1 Document outcomes and communicate reports on targets to key personnel and stakeholders. 4.2 Evaluate strategies. 4.3 Set new targets and investigate and apply new tools and strategies. 4.4 Promote successful strategies and reward participants where possible.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

REQUIRED SKILLS AND KNOWLEDGE

- using relevant environmental and resource efficiency systems, tools and procedures
- applying quality assurance systems relevant to own work area
- applying relevant supply chain procedures
- measurement and calculation techniques
- communication/consultation skills to ensure information is supplied to the work group

Reading and writing is required to comprehend documentation and interpret environmental and energy efficiency requirements and to document and maintain records

Numeracy is required to interpret numeric workplace information, readings and measurements, handle data as required and complete numeric components of workplace forms/reports.

Required knowledge

Required knowledge includes:

- how to access and use relevant environmental and resource efficiency systems, tools and procedures
- understanding of best practice approaches relevant to own area of responsibility
- strategies to maximise opportunities and minimise impacts relevant to own work area
- relevant environmental and resource efficiency issues specific to industry practices
- methods for measuring and calculating resource usage

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

A person who demonstrates competence in this unit must be able to provide evidence of the ability to implement and monitor integrated environmental and resource efficiency management policies and procedures within an organisation.

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

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

EVIDENCE GUIDE	
	<ul style="list-style-type: none"> • monitor and investigate current resource usage • develop plans to improve sustainability • implement environmental improvements. <p>Consistent performance should be demonstrated. For example, look to see that:</p> <ul style="list-style-type: none"> • environmental performance is routinely monitored and investigated • areas for improvements are followed through and the implemented changes are in turn monitored and investigated.
Context of and specific resources for assessment	<p>This section should be read in conjunction with the range of variables for this unit of competency. Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.</p> <p>Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation.</p> <p>A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<p>A holistic approach should be taken to the assessment. Competence in this unit may be assessed:</p> <ul style="list-style-type: none"> • by demonstration in the workplace • using targeted questioning for appropriate portions • through use of specific project(s) • by use of a suitable simulation and/or a range of case studies/scenarios • by a combination of these techniques. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or</p>

EVIDENCE GUIDE	
	similar assessment.
Guidance information for assessment	<p>Assessors need to be aware of any cultural issues that may affect responses to questions.</p> <p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	<p>All operations are performed in accordance with procedures.</p> <p>Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.</p> <p>Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.</p>
Environmental and resource efficiency issues	<p>Environmental and resource efficiency issues include:</p> <ul style="list-style-type: none"> addressing environmental and resource sustainability initiatives such as Environmental Management Systems, action plans, surveys and audits reference to standards, guidelines and approaches such as: <ul style="list-style-type: none"> ISO 14001 Environmental Management Systems Life Cycle Analyses

RANGE STATEMENT	
	<ul style="list-style-type: none"> • Cradle to cradle • Global Reporting Initiative • Ecological footprinting • Triple Bottom Line reporting • Product Stewardship • determining enterprise's most appropriate waste treatment including waste to landfill, recycling, re-use and wastewater treatment • applying the waste management hierarchy in the workplace • initiating and/or maintaining appropriate enterprise procedures for operational energy consumption, including stationary energy and non stationary (transport) • efficient use of water • minimising greenhouse gas emissions • use of controls to minimise the risk of environmental damage from hazardous substances
Measure	<p>Measuring techniques include:</p> <ul style="list-style-type: none"> • material fed to/consumed by plant/equipment • plant meters and gauges • job cards including kanbans • examination of invoices from suppliers • measurements made under different conditions • examination of relevant information and data • others as appropriate to the specific industry contexts.
Techniques and tools	<p>Techniques and tools may includeÂ :</p> <ul style="list-style-type: none"> • visual workplace concepts • measurement, display and/or recording devices • changed work practices/procedures • competence development and awareness training • process and equipment items
Compliance	<p>Compliance includes meeting relevant federal, state and local government laws, by-laws, regulations and codes of practice.</p>
Incidents	<p>Incidents include:</p>

RANGE STATEMENT	
	<ul style="list-style-type: none"> • breaches or potential breaches of regulations • occurrences outside of standard procedure which may lead to lower environmental performance
Purchasing strategies	<p>Purchasing strategies include:</p> <ul style="list-style-type: none"> • influencing suppliers to take up environmental sustainability • selecting materials/components with a lower environmental profile.
Stakeholders, key personnel and specialists	<p>Stakeholders, key personnel and specialists include individuals and groups both inside and outside the organisation that have some direct interest in the enterprise's conduct, actions, products and services, including:</p> <ul style="list-style-type: none"> • employees at all levels of the organisation • customers • suppliers • other organisations • key personnel within the organisation, and specialists outside it who may have particular technical expertise
Suggestions	<p>Suggestions includes ideas that help to:</p> <ul style="list-style-type: none"> • prevent and minimise environmental risks and maximise opportunities • reduce emissions of greenhouse gases • reduce use of non-renewable resources • make more efficient use of energy, water and other resources • maximise opportunities to re use and recycle materials • identify strategies to offset or mitigate environmental impacts. e.g. purchasing of carbon credits • express purchasing power through the selection of suppliers with improved environmental performance. e.g. purchasing renewable energy and materials with lower embedded carbon • eliminate the use of hazardous and toxic materials increasing the reusability/recyclability of wastes/products.

Unit Sector(s)

Unit sector	
--------------------	--

Competency field

Competency field	Competitive manufacturing tools
-------------------------	---------------------------------

Co-requisite units

Co-requisite units		

MSAENV672B Develop workplace policy and procedures for environmental sustainability

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	<p>This competency covers the outcomes required to develop and implement a workplace sustainability policy, including the modification of the policy to suit changed circumstances.</p> <p>This unit is based on the sustainability guideline standard GCSSUS03A Develop workplace policy and procedures for sustainability.</p>
------------------------	--

Application of the Unit

Application of the unit	<p>This competency applies to team leaders/supervisors/managers who are required to develop approaches to environmental sustainability within workplaces, including the development and implementation of policy.</p> <p>It includes:</p> <ul style="list-style-type: none">• Communicating with relevant stakeholders• Developing and monitoring sustainability policies• Reviewing and improving sustainability policies. <p>This competency applies to all sectors of the manufacturing industry. It may also be applied to all sections of an organisation, including office, warehouse etc.</p> <p>This unit will need to be appropriately contextualised as it is applied across an organisation and across different industry sectors.</p>
--------------------------------	---

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	This unit has no prerequisites	

Employability Skills Information

Employability skills	This unit contains employability skills.
-----------------------------	--

Elements and Performance Criteria Pre-Content

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

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Develop workplace sustainability policy.	1.1 Define <i>scope of sustainability policy</i> . 1.2 Identify and consult <i>stakeholders</i> as a key component of the policy development process. 1.3 Review environmental sustainability <i>strategies</i> relevant to all stages of work covered by the policy 1.4 Make recommendations for policy options based on likely effectiveness, timeframes and cost. 1.5 Develop policy is that reflects the organisation's commitment to sustainability as an integral part of the

ELEMENT	PERFORMANCE CRITERIA
	business planning and as a business opportunity. 1.6 Agree upon appropriate methods of implementation.
2. Communicate the policy.	2.1 Promote the policy, including its expected outcome to key stakeholders. 2.2 Inform those involved in implementing the policy as to outcomes expected, activities to be undertaken and responsibilities assigned.
3. Implement the policy.	3.1 Develop and communicate procedures to help implement the policy. 3.2 Implement <i>strategies</i> for continuous improvement in resource efficiency. 3.3 Establish record systems for tracking continuous improvements in sustainability approaches and assign responsibilities.
4. Review policy implementation	4.1 Record outcomes and provide feedback to key personnel and stakeholders. 4.2 Investigate success or otherwise of policy. 4.3 Monitor records to identify trends that may require remedial action, and use to promote continuous improvement of performance. 4.4 Modify policy and or <i>procedures</i> as required to ensure improvements are made.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- developing and implementing systems and procedures to aid in the achievement of sustainability in the workplace
- applying quality assurance systems relevant to own enterprise
- accessing and applying other relevant enterprise policies, procedures and protocols
- relevant industry competency
- interpreting business/strategic plans

This unit requires the ability to:

REQUIRED SKILLS AND KNOWLEDGE

- read and evaluate complex and formal documents such as policy and legislation
- research, analyse and present information
- prepare written reports requiring precision of expression and language and structures suited to the intended audience
- adjust communication to suit different audiences
- deal with different points of view and dissenting stakeholders.

Required knowledge

Required knowledge includes:

- understanding of relevant policy development and implementation processes and practices
- understanding of the principles, practices and available tools and techniques of sustainability management relevant to the particular industry context
- best practice approaches relevant to own work area
- equal employment opportunity, equity and diversity principles and occupational health and safety implications of policy/s being developed

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

A person who demonstrates competence in this unit must be able to provide evidence of the ability to develop and implement integrated sustainability policies and procedures within an enterprise. The review of the policy after implementation will also need to be evidenced.

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

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- develop relevant policy and procedures that comply with the regulatory requirements and business plans
- develop a workable implementation strategy
- include measurable criteria for reviewing improvement.

Consistent performance should be demonstrated. For

EVIDENCE GUIDE	
	<p>example, look to see that:</p> <ul style="list-style-type: none"> • policy implementation is reviewed • policy is developed to become part of the routine practices of the organisation.
Context of and specific resources for assessment	<p>This section should be read in conjunction with the range of variables for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation.</p> <p>A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<p>Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.</p> <p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed:</p> <ul style="list-style-type: none"> • by demonstration in the workplace • using targeted questioning for appropriate portions • through use of specific project(s) • by use of a suitable simulation and/or a range of case studies/scenarios • by a combination of these techniques. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment.</p>
Guidance information for assessment	<p>Assessors need to be aware of any cultural issues that may affect responses to questions.</p> <p>Assessment processes and techniques must be culturally</p>

EVIDENCE GUIDE

	appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.
--	--

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Scope of sustainability policy

Scope of sustainability policy include:

- The area/s of environmental sustainability to be targeted and whether social and economic sustainability will be incorporated
- The parts of the enterprise to which it is to apply, including whether it is for the whole enterprise, one site, one work area or combinations of these
- An investigation of the particular business and market context of the industry/ enterprise
- Addressing sustainability initiatives through reference to standards, guidelines and approaches such as:
 - ISO 14001 Environmental Management Systems
 - Life Cycle Analyses

RANGE STATEMENT	
	<ul style="list-style-type: none"> • Cradle to grave/cradle to cradle • Global Reporting Initiative • Ecological Footprint Assessment • Triple Bottom Line reporting • Product Stewardship.
Stakeholders	<p>Stakeholders include individuals and groups both inside and outside the organisation that have some direct interest in the enterprise's conduct, actions, products and services, including:</p> <ul style="list-style-type: none"> • employees at all levels of the organisation • customers • suppliers • regulators • other organisations.
Strategies	<p>Implementation strategies include:</p> <ul style="list-style-type: none"> • awareness raising among stakeholders • training of staff in principles and techniques of sustainability • promotional activities. <p>Continuous improvement strategies include ongoing measuring, improving and monitoring such as:</p> <ul style="list-style-type: none"> • Plan, do, check, act cycles • Kaizen (continuous improvement) • Kaizen blitz (breakthrough improvement event) • Six sigma approaches <p>Environmental sustainability strategies include:</p> <ul style="list-style-type: none"> • reducing toxic material and hazardous chemical use • minimising resource use through changes in processes, facility design and management • supply chain and life cycle management approaches • sourcing renewable energy and low carbon footprint materials • reducing, re-using, recycling and waste

RANGE STATEMENT

	reduction <ul style="list-style-type: none"> • product and process improvements • carbon offsets • reducing greenhouse gas and other emissions
--	---

Unit Sector(s)

Unit sector	
--------------------	--

Competency field

Competency field	Competitive manufacturing tools
-------------------------	---------------------------------

Co-requisite units

Co-requisite units		

MSAPMPER200C Work in accordance with an issued permit

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	<p>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'</p> <p>This unit covers the basic competency of working under a permit. Where entry to a confined space is required, then <i>MSAPMPER205B Enter confined space</i> is also required. The safety observer (standby person) competencies are covered by <i>MSAPMPER202A Observe permit work</i>. Atmospheric testing is covered by <i>MSAPMOHS217A Gas test atmospheres</i>. The issuing of permits is covered by <i>MSAPMPER300B Issue work permits</i>.</p>
------------------------	--

Application of the Unit

Application of the unit	<p>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:</p> <ul style="list-style-type: none">• identifying the range and scope of work covered by the permit• checking that the right type of permit has been issued for the type of work• adequately preparing to undertake the work, including obtaining all necessary safety equipment and PPE• undertaking the work strictly in accordance with the provisions of the permit• maintaining correct housekeeping with permit activities• completing work in accordance with the permit requirements• querying or raising matters about the permit if the scope of work/nature of the tools to be used varies from that covered by the permit• handing back the permit in accordance with procedures and obtaining appropriate sign off as required.
--------------------------------	---

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units		

Employability Skills Information

Employability Skills	This unit contains employability skills.
-----------------------------	--

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Apply for permit(s)	1.1. Confirm the scope and location of the work to be done 1.2. Identify the need for a work permit(s) for the work to be carried out. 1.3. Identify the type of work permit required. 1.4. Collate information required for the issue of the permit 1.5. Apply for the permit following the organisations requirements
2. Identify the scope of the permit.	2.1. Check that work to be done complies with the permit type. 2.2. Check that the scope and location of work comply with the

ELEMENT	PERFORMANCE CRITERIA
	<p>permit issued</p> <p>2.3. Check that the hazard controls specified on the permit are consistent with the hazard analysis</p> <p>2.4. Check that preparations specified on the permit have been completed</p> <p>2.5. Sign onto/receive the permit.</p>
3. Prepare for permitted work.	<p>3.1. Maintain safe working conditions and environment by using available isolation procedures, safety equipment and emergency procedures.</p> <p>3.2. Monitor plant conditions and hazards to ensure work under the permit remains safe.</p> <p>3.3. Ensure that appropriate safety equipment and clothing are selected and worn as required by the permit and relevant procedures.</p> <p>3.4. Inspect work area to ensure safety and compliance with permit requirements and procedures.</p>
4. Work in accordance with an issued permit.	<p>4.1. Use required hazard reduction/control measures.</p> <p>4.2. Comply with requirements of the permit including safety observer if required.</p> <p>4.3. Display issued permit on work site as required</p> <p>4.4. Ensure compliance with scope, location and timeframe specified in the permit or seek re-authorisation as required</p> <p>4.5. Suspend job and make work site safe before leaving job.</p> <p>4.6. Formally seek and receive authorised extensions to the permit when required.</p> <p>4.7. Give end of day status report to permit issuer.</p>
5. Complete permit(s) to work.	<p>5.1. Obtain new permit(s) or have existing permit(s) revalidated before work is recommenced.</p> <p>5.2. Check the work conducted against the issued permit(s) to ensure that all the nominated work requirements have been satisfied.</p> <p>5.3. Monitor general housekeeping to ensure that the site has been left in a clean and safe condition.</p> <p>5.4. Ensure personal lockouts/tag outs/isolations are removed in accordance with procedures</p> <p>5.5. Communicate status of the work conducted and the results of the permit to relevant personnel.</p> <p>5.6. Complete documentation as required and have permit signed off when job is completed.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

Competence includes the ability to:

- access and interpret information relevant to specific tasks (eg labels, MSDSs hazchem signs)
- identify changes to conditions which may lead to the permit being revoked before the job is completed
- describe and/or explain hazards associated with tasks covered by the permit, types of tests required for the issue of work permits - the types of tests to include, atmospheric/oxygen/breathability, flammability/explosivity, toxicity/TWA, temperature, humidity
- the impact of the regulatory framework and organisation procedures under which the permit operates upon the particular job(s) requiring the permit.

Language, literacy and numeracy requirements

- This unit may require the ability to read and correctly interpret complex P&ID's; speak clearly and unambiguously in English; and to explain, describe and verify sometimes complex needs and issues.
- Writing is required to the level of completing workplace forms.
- Numeracy is required to the level of being able to correctly differentiate between high and low pressures and temperatures, voltages or masses.

Required knowledge:

Knowledge and understanding of the relevant OHS and environmental requirements, in particular those relating to various situations requiring work permits, with an ability to implement the requirements in a manner that is relevant to the job. Knowledge of the organisation's standard procedures and work instructions and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Sufficient knowledge of all types of permits is required to ensure work is not carried out without the correct permit. This includes recognizing hot work and confined spaces.

Knowledge of regulatory frameworks should include:

- licence requirements for the job,
- company policy and procedures
- permit control systems

Evidence Guide

EVIDENCE GUIDE

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

Overview of assessment

Assessment of this unit should demonstrate competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Simulation may be required to allow for assessment of parts of this unit. Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

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

Competence must be demonstrated in the ability to distinguish between situations requiring the types of permit and to list the major requirements of each type of permit. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- provide reasons for a permit system
- recognise the importance of different work permits
- comply with permit conditions including the wearing of appropriate personal protective equipment (PPE)
- take appropriate action to resolve faults or report faults to appropriate personnel
- explain and implement incident response procedures.

Consistent performance should be demonstrated, e.g. look to see that:

- communications are timely and effective
- deviations from permit conditions are recognised, reported, corrected and re-authorization arranged
- actions specified in the permit/standard procedures are carried out
- all safety procedures are followed.

Context of and specific resources

A holistic approach should be taken to the assessment.

EVIDENCE GUIDE**for assessment**

Assessment will occur over a range of situations which may include disruptions to normal, smooth operation.

Competence in this unit may be assessed:

- on a plant/in the work place/a work situation
- by using a suitable simulation based on the actual plant and including walk throughs of the relevant competency components and/or a range of case studies/scenarios and role plays
- by questioning and using 'what if' scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant
- through a combination of these techniques.

These aspects may be best assessed using a range of simulations/scenarios/case studies and 'what ifs' as the stimulus with a walk through forming part of the response. These assessment activities should cover a range of problems, including new or unusual situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed. In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

While oral assessments may be appropriate there needs to be a written record for audit purposes.

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions which will be used to probe the reasoning behind the observable actions will also be required to the extent that they form part of the assessment method.

EVIDENCE GUIDE

Method of assessment	Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.
Guidance information for assessment	Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities. Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed and the safety standard required.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version/version specified by the local regulatory authority must be used.
Context	<p>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.</p> <p>The types of work permits may include:</p> <ul style="list-style-type: none"> • cold work/general permit to work • excavation • hot work • vehicle entry • minor repairs • working at heights • other special permits. <p>Note that entry to a <u>confined space</u> is covered by <i>MSAPMPER205C Enter confined space</i>. The Australian Standard (AS2865) definition given for</p>

RANGE STATEMENT	
	<p>confined space entry is used in this Training Package.</p> <p>All operations are performed in accordance with standard operating procedures (SOPs).</p> <p>Checks to ensure a workplace is safe may include:</p> <ul style="list-style-type: none"> • 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	<p>All operations are performed in accordance with procedures.</p> <p>Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. These may include:</p> <ul style="list-style-type: none"> • 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	<p>Information required for a permit includes:</p> <ul style="list-style-type: none"> • work description • tools to be used • process/methods of work/SOPs • MSDSs • JHA/JSA/SWMSs
Tools and equipment	<p>This competency includes use of safety equipment and tools such as:</p> <ul style="list-style-type: none"> • eye protection (eg goggles) • ear protection • gloves

RANGE STATEMENT	
	<ul style="list-style-type: none"> • clothing • respiratory protection • helmets • safety footwear.
Hazards	<p>Typical hazards include:</p> <ul style="list-style-type: none"> • heat, smoke, dust or other atmospheric hazards • sharp edges, protrusions or obstructions • limited head spaces or overhangs • equipment or product mass • slippery surfaces, spills or leaks • noise, rotational equipment or vibration.
Display issued permit	<p>Display issued permit on work site means to have the permit on the worksite and displayed/ready to be shown as required by the site/job requirements and may include:</p> <ul style="list-style-type: none"> • displaying it in a provided mounting • having it accessible in a folder which is on the work site • having it folded in overall pockets in a manner which allows it to be readily shown on request.
Problems	<p>'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>Key variables to be monitored include:</p> <ul style="list-style-type: none"> • 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)	<p>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.</p>

Unit Sector(s)

Unit Sector	
-------------	--

Competency field

Competency Field	
------------------	--

Co-requisite units

Co-requisite Units		

MSAPMPER205C Enter confined space

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This competency covers the entry to confined spaces, for maintenance, servicing of vessels or other necessary reasons. Work in/entry to confined spaces shall conform to relevant legislation and AS2865, or its authorised update or replacement.
------------------------	--

Application of the Unit

Application of the unit	<p>This competency applies to persons who are required to enter confined space, for maintenance purposes, for cleaning, inspection or other reasons. It is required by all persons who are required to enter a confined space, as defined by the standard AS2865, or its authorised update or replacement.</p> <p>This unit includes:</p> <ul style="list-style-type: none"> • preparing to enter the confined space • checking the preparations against the permit conditions • entering the confined space. <p>AS2865 requires reassessment 'at appropriate intervals'. The industry regards reassessment on a two to three year cycle as good practice.</p> <p>It is expected that all standby persons will also be competent to enter confined space. See <i>MSAPMPER202A Observe permit work</i> for the standby person competency.</p> <p>The issuing of confined space permits is covered by <i>MSAPMPER300B Issue work permits</i>.</p> <p>Some sites and situations will require competency in associated units as a site corequisite. Some of these possible units are identified in the Overview of Assessment. These additional units should be accessed and may be combined</p>
--------------------------------	---

	by the RTO as a skills set if appropriate.
--	--

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units	<i>MSAPMPER200C</i>	<i>Work in accordance with an issued permit</i>

Employability Skills Information

Employability Skills	This unit contains employability skills.
-----------------------------	--

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Assess confined space for entry	<p>1.1. Confirm and verify the purpose of the required entry.</p> <p>1.2. Identify and assess hazards within/around the confined space.</p> <p>1.3. Check a risk assessment associated with entry of the confined space has been conducted and documented.</p> <p>1.4. Identify and document relevant controls.</p>

ELEMENT	PERFORMANCE CRITERIA
	1.5. Take appropriate steps to ensure confined space is ready for entry. 1.6. Check the incident/emergency response plan is appropriate to the job 1.7. Rehearse own role in an incident/emergency response 1.8. Confirm and verify that the conditions of the permit reflect the risk assessment 1.9. Check the confined space is ready for entry.
2. Use safety equipment and PPE	2.1. Secure work site 2.2. Select, fit and wear designated PPE. 2.3. Select, test and use required instruments and monitors. 2.4. Challenge test atmosphere/atmospheric monitoring instrument if required before entry. 2.5. Confirm test/monitoring results show entry is safe
3. Work in accordance with confined space requirements.	3.1. Enter confined space safely 3.2. Work in compliance with permit requirements. 3.3. Arrange re authorisation/reissue of permits as required. 3.4. Complete confined space working documentation. 3.5. Maintain communications with all relevant personnel. 3.6. Take appropriate action if there is a change in risk/work environment.
4. Conclude confined space operations in accordance with procedures.	4.1. Recover, clean, service and store equipment. 4.2. Complete required final documentation. 4.3. Report any issues.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

Competence includes the ability to:

- access and interpret information relevant to specific tasks (eg labels, MSDSs hazchem

REQUIRED SKILLS AND KNOWLEDGE

signs)

- access and apply hazard controls
- identify changes to conditions which may lead to the permit being revoked before the job is completed
- describe and/or explain hazards associated with tasks covered by the permit, types of tests required for the issue of work permits - the types of tests to include, atmospheric/oxygen/breathability, flammability/explosivity, toxicity/TWA, temperature, humidity
- interpret and respond to gas test/monitoring results/information.
- identify a change in work conditions, possible new hazards and so the required hazard controls and obtain revalidation of permit
- implement hazard controls

Language, literacy and numeracy requirements

This unit requires the ability to:

- read and correctly interpret required documentation relevant to the entry
- speak clearly and unambiguously in English
- explain, describe and verify sometimes complex needs and issues
- understand the permit requirements.

Writing is required to the level of completing workplace forms and producing any required reports.

Numeracy is required to the level of being able to correctly differentiate between high and low pressures and temperatures, voltages or masses and interpret gas test/monitoring results.

Required knowledge:

Knowledge and understanding of the relevant OHS and environmental requirements, in particular those relating to various situations requiring work permits, with an ability to implement the requirements in a manner that is relevant to the job. Knowledge of the organisation's standard procedures and work instructions and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Sufficient knowledge of all types of permits is required to ensure work is not carried out without the correct written authority.

Knowledge of regulatory frameworks should include:

- OHS
- EPA
- OHS authorities and ASCC/NOHSC/state CSE regulations
- licence requirements
- company/organisation policy and permit control systems

REQUIRED SKILLS AND KNOWLEDGE

- other relevant standards.

Knowledge of and the application to the job of relevant legislation and AS2865/2009, or its authorised update or replacement, is essential. Australian Standard HB 213-2003 Guidelines for Safe Working in Confined Spaces, or its relevant replacement, is also a useful reference.

Knowledge of the organisation's confined space procedures is required.

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

Assessment of this unit may be undertaken as an individual unit or in combination with other relevant units. Other possible relevant units include:

- RIIRIS201A Conduct local risk control
- RIIOHS204A Work safely at heights
- MSAPMOHS200A Work safely
- MSAPMOHS216A Operate breathing apparatus
- MSAPMOHS217A Gas test atmospheres
- MSAPMPER200B Work in accordance with an issued permit
- MSAPMPER202A Observe permit work
- PUASAR005A Undertake confined space rescue.

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

Competence must be demonstrated in the ability to distinguish between situations requiring different permits and to list the major applications and scope of each type of permit.

The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

As working in a confined space is inherently hazardous it is essential that the worker be able to demonstrate:

- recognition of a confined space
- the ability to work within a confined space

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

- compliance with the permit conditions
- recognition and control of atmospheric hazards
- use of confined space entry and exit equipment relevant to the site/job
- selection, use and maintenance of appropriate PPE
- use of communication equipment and processes applicable to confined space work
- completion of documents and records relevant to confined space work
- understanding of and the ability to initiate incident/emergency response plan.

Consistent performance should be demonstrated. For example, look to see that:

- communications are timely and effective
- deviations from permit conditions are recognised, reported and corrected and the permit is re-authorised or re-issued by competent person
- actions specified in the permit/standard procedures are carried out
- all safety procedures are followed.

Competence in this unit should be determined by a practical demonstration of a confined space entry. This may be achieved:

- by using a suitable simulation based on an actual plant AND
- by questioning and using 'what if' scenarios

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/ simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to a plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions which will be used to probe the reasoning behind the observable actions will also be required to the extent that they form

EVIDENCE GUIDE**Method of assessment**

part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Guidance information for assessment

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed and the safety standard required.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicized wording, if used in the Performance Criteria, is detailed below. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Codes of practice/ standards

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version/version specified by the local regulatory authority must be used.

Confined space

The Australian standard (AS2865-2009) definition given for confined space is used in this Training Package, i.e.:

'An enclosed or partially enclosed space that is not intended or designed primarily for human occupancy, within which there is a risk of one or more of the following:

- (a) An oxygen concentration outside the safe oxygen range.
- (b) A concentration of airborne contaminant that may cause impairment, loss of consciousness or asphyxiation.
- (c) A concentration of flammable airborne contaminant that may cause injury from fire or explosion.
- (d) Engulfment in a stored free-flowing solid or a rising level of liquid that may cause suffocation or drowning.'

Entry

Entry to a confined space is defined by AS2865 as:
'when a person's head or upper body is within the boundary of the

RANGE STATEMENT	
	<p>confined space.</p> <p>NOTE: Inserting an arm for the purpose of atmospheric testing is not considered as entry to a confined space.'</p>
Procedures	<p>All operations are performed in accordance with procedures.</p> <p>Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. These may include:</p> <ul style="list-style-type: none"> • legislation/codes • OHS legislation, codes of practice and guidance material • EPA • National and Australian standards • licence and certification requirements where relevant • internal permit control system • process isolations complete • mechanical and electrical isolations in place • atmospheric testing complete and atmosphere safe or if not safe and cannot be made safe then appropriate measures are implemented as per procedures • relevant personnel informed of work and agree that it is safe and appropriate to proceed • communication protocols with particular reference to organisation confined space requirements.
Ready for entry	<p>Checking the confined space is ready for entry includes checking:</p> <ul style="list-style-type: none"> • isolations are complete and appropriate • isolation provide positive isolation • atmosphere is safe (or if necessary relevant measure are in place to ensure safe entry into an unsafe atmosphere) • safe entry and exit methods are in place • other items to ensure compliance with procedures, permits, relevant legislation and AS2865. <p>Appropriate steps to be taken if the confined space is not ready for entry may include reporting deficiencies and refusing to enter the space.</p>
Conditions of the permit	<p>Conditions of the permit include all hazard controls.</p> <p>Permit conditions may require atmospheric testing/monitoring in which case MSAPMOHS217A Gas test atmospheres will also be required.</p>

RANGE STATEMENT	
Secure work site	<p>Secure work site includes selecting and erecting/deploying required:</p> <ul style="list-style-type: none"> • protective equipment, • apparatus • signs • barriers • etc <p>as defined in the confined space entry permit requirements, AS2865 and other relevant requirements.</p>
Designated PPE	<p>Designated PPE (personal protective clothing and equipment) may include:</p> <ul style="list-style-type: none"> • eye protection (e.g. goggles) • ear protection • gloves • clothing • respiratory protection • helmets • safety footwear • lifelines and harnesses • personal monitors and alarms • other relevant PPE <p>as defined in the confined space entry procedures and permit requirements</p>
Required instruments and monitors	<p>Required instruments and monitors include:</p> <ul style="list-style-type: none"> • instruments used for pre entry testing appropriate to the hazards • continuous monitors appropriate for the hazards • other devices used to test the confined space atmosphere: <p>as required by the permit conditions</p>
Re-authorisation/reissue of permits	<p>Re-authorisation/reissue of permits may be required when:</p> <ul style="list-style-type: none"> • there is any change to work undertaken • the work situation changes • there is a gap in work continuity • the permit requires it • other site rules require it • other reasons
Confined space permit	<p>The confined space permit should meet the requirements of AS2865 - 2009 or other appropriate standard</p>

RANGE STATEMENT	
Working documentation	<p>Working documentation includes:</p> <ul style="list-style-type: none"> • entry/exit/re-entry logs • other documentation required by AS2865 (eg s2.9) • other documentation required by the permit(s) • other documentation required by the site etc.
Appropriate action if there is a change in risk	<p>Appropriate action if there is a change in risk includes any or all of:</p> <ul style="list-style-type: none"> • seeking revalidation of the permit • evacuating the confined space • instigating/undertaking testing • raising the alarm • initiating the emergency/incident response plan • other relevant action.
Final documentation	<p>Final documentation includes:</p> <ul style="list-style-type: none"> • signing off of permit • documentation related to equipment used • other required records.
Reporting of issues	<p>Reporting of issues includes:</p> <ul style="list-style-type: none"> • feedback re the work and methods of improving the work process • signs and symptoms of operational stress, • equipment malfunctions • wear and tear of equipment, tools etc • condition of safety/rescue equipment • observations of the condition of the confined space <p>within the level of competence of the person making the report.</p>
Hazards	<p>Typical may hazards include:</p> <ul style="list-style-type: none"> • heat, smoke, dust or other atmospheric hazards • sharp edges, protrusions or obstructions • limited head spaces or overhangs • equipment or product mass • slippery surfaces, spills or leaks • noise, rotational equipment or vibration • high/low oxygen content • hazardous atmospheres (eg combustible, toxic) • entrapment • engulfment • heat stress

RANGE STATEMENT	
	<ul style="list-style-type: none"> • claustrophobia • external hazards that may impact on the safety of those working in the confined space (eg exhaust fume, or other hazardous vapours, being drawn into the confined space by ventilation fans) • other hazards eg as identified in AS2865.
Variables	<p>Key variables to be monitored include:</p> <ul style="list-style-type: none"> • sites under which permit activities must be applied • type of permit(s) to be executed • types of tools and equipment to be employed • size of work team • scope and urgency of work • persons in the confined space/rotation of people in confined space • environmental conditions (eg weather).
Health, safety and environment (HSE)	<p>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.</p>

Unit Sector(s)

Unit Sector	
-------------	--

Competency field

Competency Field	
------------------	--

Co-requisite units

Co-requisite Units	
--------------------	--

MSAPMPER300C Issue work permits

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor	This competency unit addresses the need for personnel who issue work permits to understand the permit system, know the limitations of each permit and make decisions regarding the need for and correct use of each permit. This competency unit includes the issue of any and all permits. It applies to the issuing of permits covering a single plant or plant area such as might be an operators scope of responsibility.
------------------------	---

Application of the Unit

Application of the unit	<p>This competency applies to personnel who are required to issues appropriate permits to work to persons conducting a variety of activities in workplace environments in which hazards exist or specific procedures need to followed and monitored to protect the safety of personnel and the integrity of plant or process. It includes:</p> <ul style="list-style-type: none">• reviewing the conditions under which the work will be undertaken• examining the site to determining the hazards and safety requirements applicable to the site• ensuring the appropriate permit(s) is (are) selected depending on the organisations procedures• determining the appropriate conditions for the permit(s)• raising, authorising and issuing the necessary permit(s)• monitoring compliance with the permit conditions• reporting any indiscretions or violations of permit conditions and where necessary revoking permits• managing the permit process especially in shift hand overs or extensions to work activities• withdrawing and signing off work permits on completion of the work and verification that the requirements of the permit have been complied with.
--------------------------------	---

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Pre-requisite Units	<i>RIIRIS201A</i>	<i>Conduct local risk control</i>

Employability Skills Information

Employability Skills	This unit contains employability skills.
-----------------------------	--

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify need for work permit	1.1. Understand work permit system. 1.2. Identify and confirm with appropriate personnel the need for work permit. 1.3. Identify the correct permit for each situation.
2. Prepare work site for authorised work	2.1. Undertake an inspection of the work site. 2.2. Identify OHS and environmental requirements. 2.3. Conduct hazard identification and risk assessment. 2.4. Ensure work site is prepared in accordance specified work permit conditions. 2.5. Check permit conditions and report to appropriate personnel. 2.6. Identify need for and carry out testing in accordance with

ELEMENT	PERFORMANCE CRITERIA
	standard operating procedures.
3. Raise and issue work permits	3.1.Ensure conditions are documented on permit. 3.2.Ensure appropriate testing carried out and results documented on permit. 3.3.Determine an appropriate validity period 3.4.Check that permit conditions are met (ie validate permit). 3.5.Complete and authorise permit. 3.6.Ensure recipient(s) is advised of and agrees to abide by the requirements of the permit(s). 3.7.Ensure recipient(s) signs permit(s).
4. Monitor work for compliance	4.1.Undertake regular site inspections. 4.2.Monitor conditions and work progress and respond appropriately to changing conditions and circumstances. 4.3.Ensure permit currency and revalidate as required. 4.4.Ensure permit is displayed in prominent position. 4.5.Identify and, act on incidences of non-compliance and report promptly to relevant personnel. 4.6.Report any issues which arise with regard to work under the permit in accordance with procedures.
5. Receive end of day report	5.1.Receive end of day report from permit recipients 5.2.Confirm job progress and status. 5.3.Revalidate/arrange for revalidation of permit as required 5.4.Confirm work area has been left safe 5.5.Handover ongoing permits and status of suspended permits to oncoming shift.
6. Close work permit	6.1.Inspect job status. 6.2.Check that work undertaken satisfies permit conditions. 6.3.Ensure that work site is ready for a safe return to working conditions. 6.4.Check required returns to work status have been completed. 6.5.Sign off documentation and close permit in accordance with standard operating procedures. 6.6.Communicate work site and process status to relevant personnel.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills:

Competence includes the ability to select, apply and/or explain:

- appropriate PPE
- Australian Standard AS2865 -Confined Space
- Australian Standard AS1674.1 Safety in welding and allied processes (covers all hotn work)
- types of permits and what they cover
- hazards associated with each type of permit
- permit control system
- hazards of the area for which permit is being issued
- hazards that may be created by the interactions of the permit, the process and the plant area
- identification of container and goods coding and HAZCHEM markings
- production workflow sequences
- focus of operation of work systems and equipment
- application of relevant agreements, codes of practice and other legislative requirements
- methods of hazard analysis
- hazards of the materials and process and appropriate hazard control procedures, including hierarchy of control
- identification and correct use of equipment, processes and procedures
- selecting appropriate tests and knowing what the tests are for
- conducting and interpreting tests for contaminant gases and other hazards
- testing - types of testing may include:
 - atmospheric, including explosivity, O₂
 - flammability
 - toxicity
 - temperature
 - humidity
 - combustibles' oxygen, enriched or reduced
- estimating ventilation required for making vessels safe (eg for confined space entry, hot work)y including applying the formula for factors such as:
 - space turnover rate,
 - number of turnovers
- challenging/checking performance of monitoring and testing equipment against a standard sample
- supervision/monitoring of contractors.

REQUIRED SKILLS AND KNOWLEDGE

Some sources of underpinning OHS knowledge include appropriate OHS and Dangerous Goods legislation, Australian Standards and Safework Australia, State or Territory codes such as:

- NOHSC:1010 - National Standard for Plant
- AS4024.1 Safeguarding of machinery - general principles
- NOHSC: 1003 National exposure standards for atmospheric contaminants in the occupational environment.

The regulatory framework to include:

- OHS
- EPA
- OHS authorities and Safework Australia
- licence and certification requirements
- company policy and permit control systems
- other relevant standards.

This unit requires the ability to:

- read and correctly interpret complex P&IDs
- speak clearly and unambiguously in English
- explain, describe and verify sometimes complex needs and issues.

Required knowledge:

Knowledge and understanding of the materials, equipment and process sufficient to recognise situations requiring different types of work permits and then implement the appropriate action.

Knowledge of the organisation's standard procedures and work instructions and relevant regulatory requirements under which permit systems operate, along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Knowledge of the relevant requirements under AS2865.

Writing is required to the level of completing workplace forms and producing reports.

Numeracy is required to the level of being able to correctly differentiate between high and low pressures and temperatures, voltages or masses.

Evidence Guide

EVIDENCE GUIDE

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and

EVIDENCE GUIDE

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

Overview of assessment

Assessment of this unit should demonstrate competence on actual plant and equipment in a work environment.

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

Competence must be demonstrated in the ability to distinguish between situations requiring the major types of permits and to list the major requirements of each type of permit.

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- correctly identify situations requiring work permits
- identify and apply legislative requirements, relevant standards and codes of practice (which may be incorporated in the organisation's procedures) to the issuing of work permits
- list the requirements of each type of permit
- plan own work process within workplace procedures and explain the reasons for the steps in the process.

Consistent performance should be demonstrated. For example, look to see that:

- correct permit issued
- hazards are identified and controlled in the permit by applying the hierarchy of control
- required personal protective equipment (PPE) is specified
- problems are anticipated
- problems are efficiently resolved.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new or unusual situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Context of and specific resources

Assessors must be satisfied that the person can

EVIDENCE GUIDE**for assessment**

consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge. A holistic approach should be taken to the assessment.

Competence in this unit may be assessed:

- by use of a suitable simulation and/or a range of case studies/scenarios. Simulations should be based on the actual plant and will include walk throughs of the relevant competency components
- through questioning and the use of "what if" scenarios both on the plant and off the plant.
- by a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

This section should be read in conjunction with the Range Statement for this unit of competency.

Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Method of assessment

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Guidance information for assessment

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the

EVIDENCE GUIDE

work being performed and the safety standard required.

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Codes of practice/ standards

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version/version specified by the local regulatory authority must be used.

Context

This competency covers the issue of any and all work permits. Permits are called clearances by some organisations. The types of permit include:

- cold work
- excavation
- vehicle entry
- minor repairs
- working at heights
- hot work
- confined space
- electrical
- increased hazard
- other relevant permits.

Requirements identified on the permit may include testing of atmospheric conditions, ventilation and control measures such as isolation, barriers, tag out/lockout signs, communications, incident response.

A 'competent person' is a person who has, through a combination of training, education or experience, acquired knowledge and skills enabling that person to correctly perform a specified task.

Safety structures and controls may include automatic plant shut down buttons, cords/lanyards, alarms, barriers, guards, earth leakage devices, tag out/lock out procedures, warning lights.

The work permit system

The work permit system includes:

- types of permits

RANGE STATEMENT	
	<ul style="list-style-type: none"> • legislative/regulatory/standards framework • roles and responsibilities of parties under the permit system • equipment which can and cannot be used for types of permit • alternative ways of conducting a job
Confined space	<p>The Australian standard (AS2865-2009) definition given for confined space is used in this Training Package, i.e.:</p> <p>'An enclosed or partially enclosed space that is not intended or designed primarily for human occupancy, within which there is a risk of one or more of the following:</p> <p>(a) An oxygen concentration outside the safe oxygen range.</p> <p>(b) A concentration of airborne contaminant that may cause impairment, loss of consciousness or asphyxiation.</p> <p>(c) A concentration of flammable airborne contaminant that may cause injury from fire or explosion.</p> <p>(d) Engulfment in a stored free-flowing solid or a rising level of liquid that may cause suffocation or drowning.'</p>
Procedures	<p>All operations are performed in accordance with procedures.</p> <p>Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. These may include:</p> <ul style="list-style-type: none"> • OHS • EPA • OHS authorities and AASCC • Australian Standards • licence requirements • company policy and permit control systems • other relevant standards.
Preparation	<p>Preparation of work site includes:</p> <ul style="list-style-type: none"> • mechanical, electrical and other energy sources, and process isolations • de-energising all sources of energy/pressure • purging of lines • lock out/tag out procedures • blinding/blanking lines.
Tools and equipment	<p>This competency includes use of equipment and tools such as:</p> <ul style="list-style-type: none"> • writing instruments • computers and printers • calculators

RANGE STATEMENT	
	<ul style="list-style-type: none"> • testing equipment.
Hazards	<p>Typical hazards include:</p> <ul style="list-style-type: none"> • unsafe conditions developing through failure to conform with the provisions of the permit • injuries to personnel • equipment failures • releases of toxic or noxious substances.
Returns to work status	<p>Returns to work status may include:</p> <ul style="list-style-type: none"> • de-isolation • removal of lockouts/tag outs • removal of drain covers • etc.
Problems	<p>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.</p> <p>Typical process and product problems may include:</p> <ul style="list-style-type: none"> • selection of the wrong permit • incorrect information being supplied with the permit • errors being made in the completion of permit data • failure to correctly correspond to the requirements of the permit • failure to seek clarification when anomalies occur.
Variables	<p>Key variables to be monitored include:</p> <ul style="list-style-type: none"> • types of permits being issued • permit issuing procedures • permit protocols for extended work activities beyond the end of shift • permit hand-over procedures.
Health, safety and environment (HSE)	<p>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.</p>

Unit Sector(s)

Unit Sector	
-------------	--

Competency field

Competency Field	
------------------	--

Co-requisite units

Co-requisite Units		

MSS015002A Develop strategies for more sustainable use of resources

Modification History

Not applicable.

Unit Descriptor

This unit of competency covers identifying strategies for more sustainable uses of resources. The unit includes the identification of waste as defined in lean manufacturing (muda) as part of a strategy for achieving better sustainability outcomes in a process as well as quantifying theoretical and actual resource (including energy) consumption.

Application of the Unit

This unit applies inside organisations and their value chains and specifically applies to the use of resources as part of an overall response to improving sustainability. The unit has been developed with manufacturing operations as a focus. However, because of the range of organisations in a typical manufacturing value chain it may also be applied to other types of organisations.

The unit assumes that a decision to attempt to achieve more sustainable use of resources has already been made. The unit covers the skills needed for developing a strategic approach to resource use at the organisation or value chain level.

The unit does not cover the technical skills required to implement specific initiatives that may be identified as part of the strategic plan. However, there is a requirement to present and organise data. The complexity of this requirement will vary according to the type and scale of the organisation's processes. Where required, appropriate mathematics and statistics units should be selected from the MEM05 Metal and Engineering Training Package or other appropriate Training Package.

Where the carbon footprint (or water footprint or similar) of an enterprise or value chain is known, the unit can be applied to developing strategies for the reduction of that footprint.

It would typically be undertaken by a manager or technical specialist who had a major responsibility for sustainability as part of a broader work role, or sustainability may be their primary work responsibility.

For specific techniques covering the auditing of water, energy, emissions and transport, refer to relevant sustainability audit units.

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

- | | |
|---|---|
| 1 Quantify resource consumption | 1.1 Identify all significant resources used by process |
| | 1.2 Identify consumption measurements available for each resource |
| | 1.3 Determine consumption for each resource |
| 2 Quantify resource loss | 2.1 Determine theoretical consumption of each resource |
| | 2.2 Compare theoretical consumption with actual consumption |
| | 2.3 Determine loss (emission) for each resource |
| 3 Recommend strategies for reducing waste | 3.1 Short-list high emission process steps |
| | 3.2 Analyse process to identify emission steps or locations |
| | 3.3 Determine root cause of emission |
| | 3.4 Investigate methods for reducing emission |
| | 3.5 Develop strategies and recommendations for improvement |
| 4 Prepare resources use audit report | 4.1 Identify purpose of report and key stakeholders |
| | 4.2 Compile data, implications and recommendations |
| | 4.3 Consult with stakeholders as appropriate |
| | 4.4 Draft and present report |

Required Skills and Knowledge

Required knowledge includes:

- the concept of muda. Muda is usually summarised under the headings of the ‘seven wastes’ which include:
 - overproduction
 - delay/waiting
 - transportation
 - over processing
 - excess inventory
 - unnecessary motion
 - defects and rework
- methods of material balancing
- methods of energy balancing
- methods of comparing theoretical with actual resource consumption
- methods for mapping manufacturing processes and resources consumed
- methods of measuring actual resource usage
- concept of muda and muda categories
- muda reduction methods and strategies
- AS/NZS ISO 14000 Environmental Management Standards

Required skills include:

- calculating, manipulating and interpreting numerical data, including establishing series, means and averages, absolute and proportional material and energy usage per product or process, correlations and rates of change
- analysing and conducting root cause analysis
- calculating theoretical consumption of resources as the minimum amount of resources per product or process step as defined by the customer multiplied by the rate of production or process
- calculating actual consumption of resources per unit (e.g. per product, operation, site or value chain)
- writing technical reports
- consulting with technical experts and internal and external stakeholders

Evidence Guide

Overview of assessment	A person who demonstrates competency in this unit must be able to identify and quantify resources and waste in a process, recommend strategies to reduce waste and prepare a report with recommendations.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include:</p> <ul style="list-style-type: none"> quantifying significant resource consumption and emission using materials balancing identifying and consulting with stakeholders developing strategies for reducing emissions preparing and presenting a resources use report.
Context of and specific resources for assessment	<ul style="list-style-type: none"> This unit of competency is to be assessed in the workplace or a simulated workplace environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace. This unit of competency may be assessed with other relevant units addressing sustainability at the enterprise level or other units requiring the exercise of the skills and knowledge covered by this unit. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
Method of assessment	<ul style="list-style-type: none"> 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. 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.
Guidance information for assessment	

Range Statement

Waste	Waste in this unit is used in the broader sense of ‘muda’ as used in lean manufacturing and the competitive manufacturing units of competency developed by Manufacturing Skills Australia (MSA)
Emissions	<p>Emissions means all materials which enter the process/site but which do not leave as part of the product and so includes:</p> <ul style="list-style-type: none"> known or able to be physically measured emissions of: <ul style="list-style-type: none"> gases, vapours and fumes liquids solids assumed emissions through material balancing assumed emissions through energy loss, including heat, friction and other energy conversion yield losses
Theoretical consumption	Theoretical consumption of resources is the minimum amount of resources per product as defined by the customer multiplied by the rate of production
Actual consumption	Actual consumption is the amount of a resource entering the value chain
Significant resources	<p>Significant resources includes resources which are deemed to be significant because they are:</p> <ul style="list-style-type: none"> high volume high value high environmental significance important to the product or process covered by legislation or regulation important to the enterprise <p>It need not include resources which are incidental to the activity and which are not otherwise significant</p>

Unit Sector(s)

Sustainability

Custom Content Section

Not applicable.

MSS402030A Apply cost factors to work practices

Modification History

New unit, superseding MSACMT230A Apply cost factors to work practices - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by an individual to identify cost components in their work and to be able to determine, in general terms, the cost impacts of alternative actions.

Application of the Unit

This unit applies to an individual who is required to contribute to, and be involved in, the assessment of cost factors in their work. This may be done individually or in a team environment.

The unit covers the skills to be able to assess the relative costs of the alternatives and use this as one of the key factors in making decisions. Decisions are made within the scope of the employee's authority and according to procedures. Typical decisions include those that contribute to the efficient organisation of own work and the improvement of production time and cycle times.

This unit requires the application of skills associated with problem solving to identify cost factors and cost implications of own work and self-management to apply cost-effective practices.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a

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

unit of competency. text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Identify the major cost components of product or process in own work area	1.1	Identify cost components in the product or process in own work area
		1.2	Recognise the impact of current or alternative actions on costs
2	Identify constraints to cost-efficiency	2.1	Identify required production/process rate and major costs
		2.2	Identify costs factors under individual or team control
		2.3	Relate identified costs factors to impact on overall cost of production/process
		2.4	Identify cost factors that are a constraint to cost-efficiency in own work area
3	Apply cost-efficient work practices	3.1	Identify and explain to relevant people the implications of possible actions/changes to improve cost-efficiency in simple financial terms
		3.2	Identify non-financial implications of proposed changes in discussion with relevant people
		3.3	Select actions which minimise overall costs
		3.4	Monitor actions to ensure cost-efficiency in own work area is maintained

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with others to clarify cost factors and contribute suggestions for improvement
- visualising normal operational procedures in terms of flow
- distinguishing between fixed and variable costs
- identifying fixed and variable cost components relevant to own work, including where applicable:
 - power/energy
 - materials, plant and equipment
 - production or process time, including impact on salary and wages
 - office expenses
 - government taxes and charges

Required knowledge

Required knowledge includes:

- cost components of products made
- costs concepts, such as expense and income
- major cost contributors to product (e.g. energy)
- the difference between internally and externally controlled costs
- difference between overhead, labour and consumables

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none">• identify the scope of their own and their teams work and relate it to the overall flow of work in the organisation• express cost factors in specific terms (e.g. cost per
--	---

	<p>item, process and task) and not just in a general manner</p> <ul style="list-style-type: none"> • identify and express costs factors in simple financial terms • use cost factors to select lower cost alternatives when making decisions.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and</p>

	literacy capacity of the candidate and the work being performed.
--	--

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems
--	---

	<p>and practices</p> <ul style="list-style-type: none"> the size of the enterprise the work organisation, culture, regulatory environment and the industry sector
Cost components	<p>Cost components include:</p> <ul style="list-style-type: none"> fixed and variable costs, such as power/energy, materials, plant and equipment, production or process time, including impact on salary and wages office expenses, such as telephone government taxes and charges
Process	<p>Process may include:</p> <ul style="list-style-type: none"> a production, maintenance, logistics, office or other support process in an organisation
Overall cost	<p>Overall cost may include:</p> <ul style="list-style-type: none"> the assessment of negative and positive financial implications negative long-term issues, such as occupational health and safety (OHS), environmental and regulatory issues

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402031A Interpret product costs in terms of customer requirements

Modification History

New unit, superseding MSACMT231A Interpret product costs in terms of customer requirements - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by an individual to be able to identify the major cost components of either products or processes, the basic relationship of these to customer benefit, and use this to help minimise waste (defined as anything not delivering value as defined by the customer). It has a different focus to MSS402030A Apply cost factors to work practices, which focuses on costs in isolation, whereas this unit regards all costs not directly leading to customer benefit as waste.

Application of the Unit

This unit applies to an individual who uses their understanding of the customer's requirements of the product or process being undertaken as the basis for investigating work processes to identify waste sources and then takes action relevant to their level of competency and authority to reduce this waste. It requires an understanding of both the cost factors in the products they make and also the benefits which the customer derives from the product.

This competency may be performed individually or in a team-based environment.

This unit requires the application of skills associated with analysis and problem solving to identify waste and determine ways to minimise waste. This unit requires initiative and enterprise and application of learning in concepts of waste and waste minimisation.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Identify cost components deriving from customer benefit and other costs	1.1	Identify customer features/benefits in product or process being undertaken
		1.2	Identify cost components which deliver customer features/benefits and those which do not
2	Compare required performance of product or process steps with actual performance	2.1	Identify performance required to meet customer needs in own work and that of team
		2.2	Identify actual performance
		2.3	Compare cost components of products or process with current customer-related targets
		2.4	Separate costs components into those that contribute to customer features/benefits and those that do not
		2.5	Determine non-contributing cost components which are under control of the individual or team
3	Minimise waste	3.1	Recommend changes to eliminate or reduce waste
		3.2	Adopt changes which minimises waste
		3.3	Monitor effect of changes to ensure gains are made against customer features/benefits

Required Skills and Knowledge

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

Required skills

Required skills include:

- identifying customer benefit in own work and that of the individual's team
- identifying financial and other performance indicators for own work and of team, including where appropriate, takt time
- communicating with others to clarify cost factors and contribute suggestions for improvement
- visualising normal operational procedures in terms of flow
- distinguishing between fixed and variable costs
- classifying fixed and variable cost components in terms of relevancy to customer benefit, including where applicable:
 - power/energy
 - materials, plant and equipment
 - production or process time, including impact on salary and wages
 - required and unnecessary downtime
 - office expenses
 - government taxes and charges

Required knowledge

Required knowledge includes:

- value as defined by the customer and the relevancy to own and team's work
- ability to access company information about:
 - customer features/benefits
 - cost components of products made
 - costs concepts, such as expense and income
 - major cost contributors to product (e.g. energy)
- the difference between internally and externally controlled costs
- difference between overhead, labour and consumables

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment

Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • identify customer benefit from own and team's work • express cost factors (financial and other factors) in specific terms (e.g. cost per item, process and task), and not just in a general manner • identify and express costs factors in simple financial terms • contribute suggestions for improvement to minimise waste and overall costs.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p>

	Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just In Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving
--	--

	<ul style="list-style-type: none"> • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Customer features/benefits	<p>Customer features/benefits include:</p> <ul style="list-style-type: none"> • characteristics of the product or service which add value to the customer, this value may be assessed in financial or features terms <p>The customer may be:</p> <ul style="list-style-type: none"> • internal or external
Performance	<p>Performance may include:</p> <ul style="list-style-type: none"> • the rate of output of the plant compared to the rate required to meet demand • takt, where takt time is the allowable time to produce one product at the rate and quality customers are demanding it (this is NOT the same as cycle time, which is the normal time to complete an operation on a product – which should be less than or equal to takt time)
Customer-related targets	<p>Customer-related targets include:</p> <ul style="list-style-type: none"> • internally set financial and operational targets that contribute to meeting customer features/benefits
Contributing and non-contributing cost components	<p>Contributing costs include:</p> <ul style="list-style-type: none"> • costs that make a direct contribution to customer features/benefits. These costs continue to need to be incurred (although they may be minimised) in order to gain the customer feature/benefit <p>Non-contributing costs include:</p> <ul style="list-style-type: none"> • other costs that do not contribute to customer features/benefits. These may be costs that must be maintained, such as regulatory compliance and occupational health and safety (OHS) costs and other costs which are not required and do not contribute to customer features and so should be eliminated if possible (this is also defined in terms of <i>waste</i> – see

	below)
Waste	<p>Waste (also known as muda in the Toyota Production System and its derivatives) includes:</p> <ul style="list-style-type: none">• any activity which does not contribute to customer or organisation benefit/features in the product <p>Categories of waste include:</p> <ul style="list-style-type: none">• excess production and early production• delays• movement and transport• poor process design• inventory• inefficient performance of a process• making defective items <p>Waste for this unit may include activities which do not yield any benefit to the organisation or any benefit to the organisations customers</p>

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402040A Apply 5S procedures

Modification History

New unit, superseding MSACMT240A Apply 5S procedures in a manufacturing environment
- Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by an employee to apply 5S procedures to their own job and work area. The unit assumes the employee has a particular job and an allocated work area and that processes in the work area are known by the individual.

Application of the Unit

This unit applies to an individual in an organisation who works in an operational position as part of production, maintenance, logistics, and so on. The unit can also apply to individuals in other organisations who have a discrete role and responsibility for individually managed processes. For employees in an office, the specific office-related unit *MSS402041A Apply 5S* in an office should be selected.

This unit applies where an organisation has decided to embark on a competitive systems and practices strategy and as part of this has adopted the philosophy of 5S as one of the tools to improve performance. The employee needs to apply 5S to their job and work area and maintain the housekeeping and other standards set by 5S.

This unit requires the application of skills associated with planning and organising, problem solving and self-management, in order to identify and implement 5S housekeeping practices.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Sort needed items from unneeded	1.1	Identify all items in the work area
		1.2	Sort items to achieve deliverables and value expected by downstream and final customers
		1.3	Sort items required for regulatory or other required purposes
		1.4	Place any non-essential item in a appropriate place other than the workplace
		1.5	Regularly check that only essential items are in the work area
2	Set the workplace in order	2.1	Identify the best location for each essential item
		2.2	Place each essential item in its assigned location
		2.3	After use immediately return each essential item to its assigned location
		2.4	Regularly check that each essential item is in its assigned location
3	Shine the work area	3.1	Keep the work area clean and tidy at all times
		3.2	Conduct regular housekeeping activities during shift
		3.3	Ensure the work area is neat, clean and tidy at both beginning and end of shift

4	Standardise activities	4.1	Follow procedures
		4.2	Follow checklists for activities, where available
		4.3	Keep the work area to specified standard
5	Sustain the 5S system	5.1	Clean up after completion of job and before commencing next job or end of shift
		5.2	Identify situations where compliance to standards is unlikely and take actions specified in procedures
		5.3	Inspect work area regularly for compliance to specified standard
		5.4	Recommend improvements to lift the level of compliance in the workplace

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with others to clarify issues during 5S implementation, communicate results and contribute suggestions for improvement
- visualising operations in terms of flow and contribution to customer outcomes
- planning own tasks in implementation of 5S
- implementing 5S in own work area according to instructions
- identifying waste (muda)
- prioritising activities and items
- reading and interpreting documents describing procedures
- recording activities and results against templates and other prescribed formats
- working with others
- solving problems

Required knowledge

Required knowledge includes:

- operations and processes relevant to own job
- meaning and application of 5S steps to own job and work area
- principles of efficient workplace organisation
- purposes of 5S
- methods of making/recommending improvements

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • identify own tasks and responsibilities and relate them to organisation and customer requirements • identify and explain the stages of 5S • implement 5S in own work area • identify waste (muda) in the work area.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects

	<ul style="list-style-type: none"> • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems
--	--

	<ul style="list-style-type: none"> • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
5S	<p>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:</p> <ul style="list-style-type: none"> • sort • set in order • shine • standardise • sustain
Sort	<p>Sort involves keeping only what is absolutely necessary for the processes in the work area. Sort includes:</p> <ul style="list-style-type: none"> • clearing the work area of all non-essential equipment and materials <p>Non-essential items are those not required to either produce product, conduct process or operations, or make required adjustments to equipment during process or operations</p>
Set in order	<p>Set in order includes:</p> <ul style="list-style-type: none"> • assigning required equipment and materials appropriate locations in the work area

Shine	<p>Shine includes:</p> <ul style="list-style-type: none"> keeping the work area clean at all times. This should be carried out to a regular daily schedule against allowed time and, on most occasions, at the end of a job
Standardise	<p>Standardising includes:</p> <ul style="list-style-type: none"> activities that help maintain the order and the housekeeping standards using procedures and checklists developed from a procedure
Sustain	<p>Sustain includes:</p> <ul style="list-style-type: none"> making sure that daily activities are completed every day regardless of circumstance cleaning up after a job undertaking inspections, including: <ul style="list-style-type: none"> informal inspections carried out often, at least weekly formal inspections carried out at least monthly generating continuous improvement actions from daily activities following up specific actions to generate continuous improvement
Items in work area	<p>Items in work area may include:</p> <ul style="list-style-type: none"> tools jigs/fixtures materials/components plant and equipment manuals personal items (e.g. bags, lunch boxes and posters) safety equipment and personal protective equipment other items which happen to be in the work area
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> work instructions standard operating procedures formulas/recipes batch sheets temporary instructions and similar instructions provided for the operation of the plant good operating practice as may be defined by industry codes of practice (e.g. good manufacturing

	<p>practice (GMP) and responsible care) and government regulations</p> <p>Procedures may be:</p> <ul style="list-style-type: none">• written, verbal, computer based or in some other format
--	--

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402050A Monitor process capability

Modification History

New unit, MSACMT250A Monitor process capability - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required for gathering of data and the interpretation of simple information to determine the compliance of the process and the taking of action as defined by the procedures where the information reveals the process is out of control parameters.

Application of the Unit

This unit applies to an individual in an organisation adopting specific competitive systems and practices, usually either six sigma or statistical process control/three sigma, as a means of determining and improving the capability of their process to customer requirements. The individual is involved in collecting specified data and performing specified manipulations to the data (typically by plotting on a chart or by entering into a nominated computer program). The information is typically presented to team members in terms of graphs/charts which they are expected to interpret at a basic level and then take action in accordance with procedures to restore the process to being under control parameters.

This unit requires the application of skills associated with entering and monitoring operational data and information and requires initiative, enterprise and problem solving in identifying production variations and making improvement recommendations.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

1	Collect and process data	1.1	Take specified measurements/readings, as required
		1.2	Enter data in log, computer or other record
		1.3	Manipulate and/or chart data as required by procedures
2	Identify variations that are not random and take action	2.1	Examine chart and/or reliability information
		2.2	Distinguish between random variations and those with an identifiable cause
		2.3	Take action specified in procedures when a variation with an identifiable cause occurs
3	Assist in process improvement	3.1	Collect data for process capability improvement trials
		3.2	Make recommendations for improvement
		3.3	Implement revised capability monitoring procedures

Elements and Performance Criteria

Elements describe the essential outcomes of a unit of competency.

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

Required Skills and Knowledge

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

Required skills

Required skills include:

- reading and interpreting electronic and hard copy operating instructions and documents, including where used:
 - work instructions

- standard operating procedures
- formulas/recipes
- production and batch sheets
- temporary instructions
- other provided operating instructions
- monitoring performance data against specifications and control parameters
- examining equipment procedures, products and processes for possible causes of variations
- identifying when corrective action is required by reference to procedures

Required knowledge

Required knowledge includes:

- data collection methods for operations in work area
- data processing techniques required
- basic variability and normal distribution
- recognition of identifiable causes in accordance with procedures
- causes of different types of identifiable causes as defined by procedures
- actions to be taken for the different causes

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Evidence should be available of data collected and processed. There may also be evidence of assignable causes recognised and action taken. There should not be evidence of assignable causes being ignored.</p> <p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none">• identify the scope of operations, including required performance parameters in their work area• collect, enter and process data, including normal performance and variations• read and interpret data, including identifying variation to set parameters• determine where assignable causes can be allocated to variations and take appropriate action• participate in data collection, when required, for
---	--

	<p>process capability trials</p> <ul style="list-style-type: none"> • contribute suggestions for improvement.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems. • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
--	--

Six sigma	<p>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</p> <p>Six sigma is also often used as a general term covering a competitive systems and practices approach. Six sigma training typically covers several units of competency in this Training Package</p>
Three sigma	<p>Three sigma includes:</p> <ul style="list-style-type: none"> statistical process control with three sigma limits which equates to 3 defects per thousand opportunities for each product or service transaction
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> work instructions standard operating procedures formulas/recipes batch sheets temporary instructions and similar instructions provided for the smooth running of the plant good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) government regulations <p>Procedures may be:</p> <ul style="list-style-type: none"> written, verbal, computer-based or in some other form
Random variation	<p>Random variation is the term used in statistical control to refer to those variations for which no cause can be found</p>
Identifiable cause	<p>Identifiable cause (also referred to as assignable cause or special cause) refers to:</p> <ul style="list-style-type: none"> those variations for which a cause can be found and so the cause of the variation eliminated
Process capability	<p>Process capability means the capability of the process to deliver to customer defined requirements. Process capability includes process stability against standardised practices and documentation to eliminate variation against customer requirements</p>

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402051A Apply quality standards

Modification History

New unit, superseding MSACMT251A Apply quality standards - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to apply quality standards to work operations in an organisation. The unit is designed to complement competitive systems and practices units.

Application of the Unit

This unit applies to an individual who is expected to take responsibility for the quality of their own work, and to take actions specified in the procedures and within the scope of their job and authority to ensure that quality standards are met.

This unit requires the application of skills associated with interpreting and applying workplace standards and identifying and addressing problems that interfere with quality outcomes. The unit requires initiative, enterprise and self-management to ensure quality standards are achieved.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Assess own work	1.1	Continuously check completed work against workplace standards relevant to the operation being undertaken
		1.2	Demonstrate an understanding of how the work activities and completed work relate to the next production process or processes and to the final products or services concerned
		1.3	Identify and isolate faulty components, products or processes
		1.4	Record and/or report faults and any identified causes to the supervisor concerned, where required, in accordance with workplace procedures
2	Assess quality of received components, parts or materials	2.1	Continuously check received components, parts, materials, information, service or final products against workplace standards and specifications for conformance
		2.2	Demonstrate an understanding of how the received components, parts or materials, information or service relate to the current operation and how they contribute to the final quality of the product or service
		2.3	Identify and isolate faulty components, parts, materials or information that relate to the operator's work
		2.4	Record and/or report faults and any identified causes in accordance with workplace procedures
		2.5	Identify causes of any identified faults and take corrective action as specified in workplace procedures
3	Measure components, parts or materials	3.1	Measure materials, component parts, information, service or products, as required, using the appropriate measuring instruments in accordance with workplace procedures

4	Record information on production indicator	4.1	Record basic information on quality and other indicators of process performance in accordance with workplace procedures
5	Investigate causes of quality deviations	5.1	Investigate and report causes of deviations from specified quality standards for components
		5.2	Recommend suitable preventative action based on workplace quality standards and the identified causes of deviations from specified quality standards of materials

Required Skills and Knowledge

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

Required skills

Required skills include:

- interpreting work instructions, specifications, standards and patterns appropriate to own work
- carrying out relevant visual inspections of materials, component parts and final products
- carrying out relevant physical/chemical measurements or tests
- maintaining accurate work records in accordance with procedures
- carrying out work in accordance with occupational health and safety (OHS) policies and procedures
- meeting work specifications
- communicating effectively within defined workplace procedures
- interpreting and applying defined procedures

Required knowledge

Required knowledge includes:

- relevant quality standards, policies and procedures
- relevant production processes, materials and products
- basic characteristics of materials used in the relevant production processes
- safety and environmental aspects of relevant production processes
- relevant measurement techniques and quality checking procedures
- workplace procedures
- reporting procedures

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • interpret, relevant work instructions, standards and specifications appropriate to own work • check and measure relevant quality parameters • interpret results of quality checks in terms of specifications, patterns and work standards • take required action where standards of materials, component parts, final product or work processes are found to be unacceptable • maintain accurate records.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of

	<p>contingencies, improvement scenarios, and so on)</p> <ul style="list-style-type: none"> • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis
--	---

	<ul style="list-style-type: none"> • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Quality parameters	<p>Quality parameters may include:</p> <ul style="list-style-type: none"> • finish • size • durability • product or process variations • materials • alignment • colour • damage and imperfections • time
Quality checks	<p>Quality checks are against set parameters for the process or product. Examples include:</p> <ul style="list-style-type: none"> • visual inspection • physical measurements • chemical tests • checks against patterns, templates and guides • processing time
Materials	<p>Materials may include:</p> <ul style="list-style-type: none"> • physical raw materials • orders, forms and other documentation • services required for undertaking an operation (e.g. power, water, compressed air and fuel)

Measure	<p>Measure includes:</p> <ul style="list-style-type: none"> those measurements which may be taken by the employee in the workplace/at their work station
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> work instructions standard operating procedures formulas/recipes batch sheets temporary instructions and similar instructions provided for the operation of the plant good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) government regulations <p>Procedures may be:</p> <ul style="list-style-type: none"> written, verbal, computer-based or in some other format
Indicators of production performance	<p>Indicators of production performance may include:</p> <ul style="list-style-type: none"> number of items/production rate delays and causes of delays (where known) other information as specified in the procedures
Data entry/recording	<p>Data entry/recording may include:</p> <ul style="list-style-type: none"> keyboard written (including ticks or signs) verbal
Sources of information/ documents	<p>Sources of information/documents may include:</p> <ul style="list-style-type: none"> 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	<p>Investigate and report includes:</p> <ul style="list-style-type: none"> following set procedures defined for such investigations <p>Set procedures may include:</p> <ul style="list-style-type: none"> verbal instructions

	<ul style="list-style-type: none"> • documented procedures • other quality procedures as implemented within an organisation or work environment
Workplace context	<p>Workplace context includes:</p> <ul style="list-style-type: none"> • work organisation procedures and practices relating to the manufacture and quality outcomes for products • conditions of service, legislation and industrial agreements, including: <ul style="list-style-type: none"> • workplace agreements and awards • federal or state/territory legislation • standard work practice
Reporting/communication	<p>Reporting/communication may include:</p> <ul style="list-style-type: none"> • verbal and written communication in accordance with organisational policies and procedures • oral, written or visual communication and may include simple data
Being responsible for the maintenance of own work quality	<p>Being responsible for the maintenance of own work quality may include:</p> <ul style="list-style-type: none"> • contributing to the quality improvement of team or section output, where necessary, in accordance with workplace procedures • following safety, environmental, housekeeping and quality procedures as specified by materials/machine/equipment manufacturers, regulatory authorities and the organisation
Applicable regulations and legislation	<p>Applicable regulations and legislation may include:</p> <ul style="list-style-type: none"> • OHS legislation relevant to workplace activities • workers compensation legislation

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402060A Use planning software systems in operations

Modification History

New unit, superseding MSACMT260A Use planning software systems in manufacturing -
Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to access planning software (often known as Enterprise resource Planning (ERP), Materials Resource Planning (MRP and MRPII), and often by a proprietary name, to make routine business decisions required of the person as a regular part of their job.

Application of the Unit

This unit applies to an individual in an organisation using a planning software system and who must interface with that system. The unit applies to both accessing information from the planning software system and using it as an aid to decision making. This unit requires the application of communication, planning, and problem solving associated with using planning software in own work.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Use interface	1.1	Identify terminals relevant to own work station and functions
		1.2	Use keyboards, track ball/mouse and monitor and/or other peripherals to access system
		1.3	Navigate through system and screens to find program menu and data relevant to own work
		1.4	Identify and input information on own work processes at required frequency and to required detail
		1.5	Access message section and acknowledge messages
		1.6	Identify problems and make suggestions for improvements to relevance of planning software to own work
2	Access information	2.1	Identify work processes that require information from planning software system
		2.2	Obtain relevant data and information on current operations from the planning software system
		2.3	Identify the status of items in the value stream
		2.4	Access historical data and information
		2.5	Interpret information and identify and prioritise any actions required in response to information
3	Take appropriate actions in accordance with procedures	3.1	Take actions in response to information obtained from planning software
		3.2	Follow up as appropriate to ensure anticipated results have occurred
		3.3	Record adjustments and variations according to procedures

3.4 Identify any learning needs to use planning software and seek appropriate support

Required Skills and Knowledge

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

Required skills

Required skills include:

- reading and interpreting electronic and hard copy operating instructions and documents, including where used:
 - work instructions
 - standard operating procedures
 - formulas/recipes
 - production and batch sheets
 - temporary instructions
 - other provided operating instructions
- working within access control requirements of the planning software system
- identifying modules, screens, files, and so on, of software relevant to own work
- logging in and using terminals and planning software at a level of access appropriate to own work
- accurately inputting data
- searching and retrieving data
- accessing nominated assistance with planning software

Required knowledge

Required knowledge includes:

- technical knowledge needed to operate own work processes
- planning software system and operation, including:
 - terminal locations and types
 - security and access arrangements
 - range of information held in planning software relevant to own work
 - data collection methods for operations in work area
 - assistance arrangements for users of planning software
 - business activities exercised by/through the planning software system
- value created by operations for customers

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • identify the scope and relevance of planning software system to their own work • enter and retrieve data, including normal performance and variations • use planning software system to assist in own work • contribute suggestions for improvement to performance and relevance of planning software to own work area.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues

	<p>(third-party reports)</p> <ul style="list-style-type: none"> • portfolio of evidence <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz)
--	---

	<ul style="list-style-type: none"> • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Planning software	<p>Planning software includes:</p> <ul style="list-style-type: none"> • software systems which integrate a range of business information, such as finance, logistics maintenance and production (frequently referred to as ERP, MRP, MRPII or a range of proprietary names)
Relevant data and information	<p>Relevant data and information may include:</p> <ul style="list-style-type: none"> • technical and other drawings • standard operating procedures and other work instructions • production schedules including historical data • orders and order tracking information • stock control • contact lists • occupational health and safety (OHS) information
Value stream	<p>The value stream begins with the customer and includes all actions (both value-adding and non-value added) by both internal sections/departments and external organisations to meet a customer requirement.</p> <p>Depending on the operations and the customer requirement, stages where value stream actions may occur include:</p> <ul style="list-style-type: none"> • sales outlet/representative • information gathering, data analysis and research • product design • raw material sourcing • intermediate processing

	<ul style="list-style-type: none"> • final assembler/collation/preparation • support services (e.g. accounting, finance and legal) • storage and delivery to customer • after market support
Items in the value stream	<p>Items in the value stream refer to information held within the planning software system that contributes to creating value as determined by the customer. Depending on the organisation it may include:</p> <ul style="list-style-type: none"> • physical elements of the production system, such as sites, work stations, equipment, material, including stock, work in progress and finished products • information needed to meet customer requirements, such as designs, drawings, work instructions, standard operating procedures, standards, material lists and pricing • information not directly related to current customer requirements but required by the organisation
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations <p>Procedures may be:</p> <ul style="list-style-type: none"> • written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402080A Undertake root cause analysis

Modification History

New unit, superseding MSACMT280A Undertake root cause analysis - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to undertake root cause analysis (RCA) by any person. This will often be undertaken by people working in a team. This unit also covers the competencies needed by operators to contribute to an advanced maintenance strategy using RCA coupled with diagrams and charts.

Application of the Unit

This unit applies to individuals working in an organisation which is applying competitive systems and practices strategies. The unit applies to the formal problem solving to root cause that the individual must undertake in their own work area or where the individual contributes to problem solving to root cause as part of a team.

This unit requires an ability to seek and apply information from a variety of sources in order to inform RCAs. Initiative and enterprise is also required to identify quick fix and permanent solutions to problems.

Where training in a wider range of problem solving techniques and tools is required the unit MSAPMSUP390A Use structured problem solving tools should be selected.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the Performance criteria describe the performance needed to

essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Recognise problems	1.1	Identify features or occurrences indicative of a problem
		1.2	Use appropriate tools, techniques and charts to define the problem
2	Implement quick fix	2.1	Recommend a quick fix within the scope of competency and authority
		2.2	Use technology or processes relevant to the problem to implement quick fix
3	Determine root cause	3.1	Identify a range of possible causes
		3.2	Gather data and other information to eliminate or confirm possible causes
		3.3	Use available data and information to link causes and effects
		3.4	Seek assistance, as required
		3.5	Identify root cause
4	Develop permanent solution	4.1	Identify a range of methods to eliminate the root cause or break the cause tree
		4.2	Select the most appropriate solution
		4.3	Liaise with relevant people
		4.4	Recommend or implement solution within the limits of competency and authority

4.5 Monitor impact of solution and make further recommendations, as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- cooperating and working with others on problem solving
- assessing and recording information from a variety of sources
- defining potential problems factually, including:
 - location and extent of problem or incident
 - sequence of events where relevant
 - extent of deviation from normal operation or performance
- analysing potential problems across a range of varied activities and knowledge applications
- reading and constructing simple charts, such as cause and effect diagrams

Required knowledge

Required knowledge includes:

- RCA methodology, including difference between quick fixes and root cause elimination or breaking of causal tree
- principles and normal operation of equipment, plant and processes in own work area sufficient to undertake a RCA and propose solutions
- common variances to normal performance that are indicators of a problem
- use of relevant analysis tools (e.g. cause/effect diagrams, Pareto charts and 5 Whys)
- operations in own work area

Evidence Guide

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

Critical aspects for assessment and	A person who demonstrates competency in this unit must
--	--

evidence required to demonstrate competency in this unit	<p>be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • undertake problem identification • use appropriate processes to achieve root cause identification • prioritise solutions • recommend solutions and implementation procedures to problems within own area and range of technical skills and knowledge • evaluate implementation of solutions.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess response to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and</p>

	disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree
--	---

	<p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> the stage of implementation of competitive systems and practices the size of the enterprise the work organisation, culture, regulatory environment and the industry sector
Features or occurrences indicative of a problem	<p>Examples of features or occurrences indicating problems include:</p> <ul style="list-style-type: none"> variation to normal plant or equipment operation unplanned or non-conforming process or operations outcomes out of specification products excess scrap accidents and emergencies regulatory breaches customer returns and complaints reduction or loss of sales
Root cause	<p>There are many possible causes of any problem. The root cause contrasts with other possible causes of a problem which when eliminated have no impact or only ameliorate the problem. Elimination of the root cause permanently eliminates the problem. There should only be one root cause for any problem and so the analysis should continue until this one cause is found.</p>
Cause tree	<p>The series of causes is referred to as the cause tree. Not all root causes are accessible and able to be eliminated. Breaking the cause tree is such a way that the problem cannot recur is an acceptable alternative.</p> <p>Not all situations can wait for the RCA and eventual elimination of the root cause as there may be serious current impacts. The quick fix will control these immediate impacts, but does not eliminate the root cause.</p>
Quick fix	<p>A quick fix is not a short cut or side step for a permanent solution to the root cause. It is a necessary step designed to control the immediate impacts of a problem, for example, to prevent ongoing errors or to ameliorate damage.</p>
Appropriate techniques/charts	<p>Appropriate techniques/charts may include:</p> <ul style="list-style-type: none"> control charts Pareto charts

	<ul style="list-style-type: none">• run charts• flow charts• cause and effect diagrams• tree diagrams• 5 Whys analysis
--	--

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS402081A Contribute to the application of a proactive maintenance strategy

Modification History

New unit, superseding MSACMT281A Contribute to the application of a proactive maintenance strategy - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to make a positive contribution to proactive maintenance strategies, including actions that contribute to equipment uptime and overall equipment effectiveness (OEE).

Application of the Unit

This unit applies to an individual in an organisation which is following a predictive, preventative or reliability-centred maintenance strategy and which requires commitment from all employees. The employee should 'own' their equipment/plant and take an active part in the implementation of the strategy within the scope of their authority.

This unit requires the application of skills associated with accessing and maintaining equipment/plant documentation, It also requires problem solving, initiative and enterprise to continually monitor and maintain operational performance of equipment/plant used in work role.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a

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

unit of competency.

text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Maintain equipment/plant	1.1	Keep equipment/plant within area of responsibility clean
		1.2	Ensure equipment/plant is serviced and adjusted, as required, in accordance with procedures and own level of responsibility
		1.3	Access manufacturer manuals and specifications, where required, to expand knowledge on the maintenance of equipment/plant
		1.4	Access and update documentation on equipment/plant operation and maintenance as appropriate to workplace procedures
2	Monitor operation of equipment/plant	2.1	Regularly check key conditions of the equipment/plant as defined in workplace procedures
		2.2	Regularly check equipment/plant OEE
		2.3	Note any deviation from conditions specified in procedures
		2.4	Identify any previous occurrences of this deviation
3	Identify deviations and patterns	3.1	Identify any previous occurrences of a deviation
		3.2	Identify any related deviations which have occurred
		3.3	Identify any unusual occurrence which may be related to a deviation
4	Take action appropriate to	4.1	Liaise with relevant people regarding the deviation and the solution

competency and
authority on
deviation

4.2

Implement solution and/or assist with the
implementation of the solution, as appropriate

Required Skills and Knowledge

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

Required skills

Required skills include:

- reading and interpreting electronic and hard copy plant, equipment, and process instructions and documents, including where used:
 - work instructions
 - standard operating procedures
 - workshop manuals and instructions from equipment manufacturers in regards to plant or equipment operation, regular maintenance, troubleshooting, and record of use or production
 - production and batch sheets
 - temporary instructions
 - other provided operating instructions
- examining equipment procedures, products and processes for possible causes of deviations from patterns of normal use
- interpreting OEE rates
- servicing and maintaining plant and equipment consistent with area of responsibility and own technical skills

Required knowledge

Required knowledge includes:

- normal behaviour of the equipment/plant
- indicators of abnormal performance
- principles of operation of plant and equipment sufficient to recognise problems and propose solutions
- appropriate cleaning and adjusting for the equipment/plant/area as required by procedures
- concept of OEE as: *availability x performance x quality rate*

where:

- availability takes into account losses due to breakdown, set up and adjustments
- performance takes into account losses due to minor stoppages, reduced speed and idling

- quality rate takes into account t losses due to rejects, re-works and start-up waste

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • recognise deviations from normal performance patterns and deal with them appropriately • undertake operational service and maintenance on plant and equipment according to instructions.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports)

	<ul style="list-style-type: none"> • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams
--	--

	<ul style="list-style-type: none"> • OEE • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Uptime	<p>Uptime refers to:</p> <ul style="list-style-type: none"> • the overall availability of the plant – it is the inverse of downtime or the unavailability of the plant. Ideal uptime is 100%
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations <p>Procedures may be:</p> <ul style="list-style-type: none"> • written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403002A Ensure process improvements are sustained

Modification History

New unit, superseding MSACMS401A Ensure process improvements are sustained - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to ensure that the gains which have been made by using improved methods, processes and equipment are sustained as the new baseline/standard for an area of work and so prevent regression to former practices, or digression to less efficient practices.

Application of the Unit

This unit applies to individuals working in a team or work area who have already implemented competitive systems and practices related improvements in their own work and who must work effectively with others implementing competitive systems and practices to ensure that performance improvement gains are sustained.

The unit is also suitable for individuals who have formal or informal responsibility for the work of others, such as team leaders; individuals, such as senior operators, who must mentor others; or individuals, such as technicians and tradespeople, who must integrate the application of their technical skills with the implementation of competitive systems and practices in an organisation.

The unit can be applied to all areas of an organisation, including production, maintenance, logistics and office functions.

The unit covers the implementation of practices to ensure that process improvements are sustained and opportunities taken to suggest further improvements. If mistake proofing is used as one of the methods for ensuring that process improvements are sustained, the unit MSS403051A Mistake proof a production process should be selected.

Improvement initiatives can be made by any of any number of methods and by teams or individuals. The unit assumes that desired levels of performance or quality are known.

This unit requires the application of skills associated with problem solving, initiative and enterprise, and planning and organising in order to check and monitor the impacts of change. It also requires communication and the ability to work with others to assess the impact of change in own work and on other's work, as well as self-management and learning to adapt improvements according to new information and feedback.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Examine previous improvements	1.1	Identify impact of previous process improvements to systems, equipment, operations or products in work area
		1.2	Identify improvements that have not met objectives
2	Ensure corrective actions are implemented	2.1	Identify corrective actions that can be taken on process improvements that have not met objectives
		2.2	Liaise with relevant people associated with the anticipated corrective action
		2.3	Obtain any required approvals
		2.4	Ensure the supply of resources
		2.5	Check impacts of corrective action on occupational health and safety (OHS), quality and environmental systems in work area and take action in accordance with procedures, if required

		2.6	Check that self and others in team or work area have required skills for corrective actions
		2.7	Monitor implementation of corrective action
		2.8	Make required adjustments
3	Verify systems support improvement	3.1	Ensure procedures reflect improvements
		3.2	Check that training and assessment activities in team or work area reflect improvements
		3.3	Liaise with relevant people to ensure their support of the new or modified system/s
4	Audit the change	4.1	Determine an appropriate audit period/cycle
		4.2	Agree relevant measures/indicators for the improvement
		4.3	Measure performance at agreed times using agreed measures
		4.4	Investigate causes of under-performance
		4.5	Take appropriate corrective action to improve performance
		4.6	Re-audit the improvement on an agreed basis

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with others to clarify scope and stage of implementation of competitive systems and practices and contribute suggestions for further improvements in implementation
- examining normal operational procedures in terms of flow and contribution to customer benefit
- planning own tasks, including the impact on others to support competitive systems and

practices implementation

- implementing competitive systems and practices in own work area according to instructions
- identifying waste (muda)
- monitoring competitive systems and practices performance indicators for own work and work area

Required knowledge

Required knowledge includes:

- overall procedures for and process of operations relative to improvements being made
- appropriate measures of performance
- business performance goals sufficient to determine best measures of improved performance

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • identify process and operational changes as a result of implementation of competitive systems and practices • identify and assess impact of performance improvements in a work area against objectives • identify actions and resources required for further improvements • communicate and negotiate with others on improvements • apply procedures for seeking approvals and reporting non-conformances • determine appropriate period and procedures for monitoring implemented changes.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned,

	<p>currently being implemented, or implemented changes to work processes and procedures relevant to the assessee</p> <ul style="list-style-type: none"> • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using some combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of

the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Improvement	<p>Improvement may be any change aimed at reducing waste (muda). This unit is not about making the improvements, but ensuring beneficial changes remain in place</p>
Customers	<p>Customers may include:</p> <ul style="list-style-type: none"> • internal or external customers, including final

	<p>customers, as these should be used as the basis for the identification of value and waste</p> <p>The individual does not need to interface directly with the external customer, but should be able to sufficiently identify customer benefit and customer features in processes and operations of their team and their work area</p>
Suppliers	<p>Suppliers may be:</p> <ul style="list-style-type: none"> internal or external suppliers and should be sufficiently close to the individual's work as to be easily identifiable <p>The operator does not need to interface directly with external suppliers, but should be provided with sufficient information to enable them to identify supplier contribution to their own work and to customer benefit</p>
Systems	<p>Systems are used to mean any/all of the equipment, processes, procedures and work practices that are used to produce the product. A term often used in this context includes:</p> <ul style="list-style-type: none"> kaizen - the philosophy of continual improvement that every process can and should be continually evaluated and improved in terms of time required, resources used, resultant quality and other aspects relevant to the process
Resources	<p>Resources for corrective actions may include:</p> <ul style="list-style-type: none"> equipment modifications consumables people suitable work area
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> work instructions standard operating procedures formulas/recipes batch sheets temporary instructions and similar instructions provided for the smooth running of the organisation good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) and government regulations

	<p>Procedures may be:</p> <ul style="list-style-type: none"> written, verbal, computer-based or in some other format
Improvements	<p>Improvements include:</p> <ul style="list-style-type: none"> techniques for preventing mistakes by designing the operations process, equipment and tools so that an operation literally cannot be performed incorrectly (e.g. baka-yoke) techniques that generate warning signals were a mistake is about to be performed (poka-yoke) <p>Improvements may be sustained by:</p> <ul style="list-style-type: none"> use of technology so that it is impossible to do the job any other way changes to process or procedures or other changes to the operations system which, if followed, will sustain the change and this unit may be applied to all these situations
Measuring performance	<p>Measuring improvements may include:</p> <ul style="list-style-type: none"> personally taking measurements arranging for measurements to be taken/made by appropriate personnel

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403011A Facilitate implementation of competitive systems and practices

Modification History

New unit, superseding MSACMC411A Lead a competitive manufacturing team - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by individuals who facilitate, lead or mentor others in competitive systems and practices implementation in a work area.

Application of the Unit

This unit applies to people responsible for facilitating others in implementing competitive systems and practices in their work. It may apply to formally designated team leaders or people given special roles in the implementation process that go beyond their own work and which involve guiding, facilitating or mentoring others. The unit applies to competitive systems and practices implementation activities at the work area or section level.

The unit requires an individual to integrate a range of competitive systems and practices knowledge and skills as part of their role. The unit covers assisting others to understand and apply a holistic view of their job and their role within an organisation, including the objectives that must be met as part of competitive systems and practices used by the organisation.

This unit requires the application of skills associated with communication, teamwork, problem solving, initiative and enterprise, planning and organising, and self-management. This unit has a strong emphasis on planning and implementation, and also requires an ability to learn from experience and feed new information back into strategies to improve own performance and that of others.

For implementation of competitive systems and practices techniques in an office, the specialist unit *MSS403006A Facilitate implementation of competitive systems and practices in an office*, should be selected instead of this unit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Facilitate the development of process and competitive systems and practices knowledge	1.1	Ensure necessary technical documentation and information about the process and competitive systems and practices is available
		1.2	Assist and mentor others in accessing information
		1.3	Identify work activities which may inhibit the ongoing development of competitive systems and practices skills and knowledge of others
		1.4	Arrange for the provision of workforce development and training for self and others, as appropriate
		1.5	Encourage others to apply technical knowledge to the improvement process
2	Facilitate commitment to efficiency improvements	2.1	Ensure budgets, operating procedures and other related documentation is available
		2.2	Assist others to apply this information to their work responsibilities

- | | | | |
|---|--|-----|---|
| | | 2.3 | Encourage the identification of waste |
| | | 2.4 | Encourage an environment where efficiency improvements are recommended by fellow employees |
| 3 | Encourage a competitive systems and practices approach to work | 3.1 | Encourage and, where necessary, develop communications between specialists and work group members |
| | | 3.2 | Lead development of strategies to monitor and deal with identified waste issues |
| | | 3.3 | Resource and encourage other employees to identify and take appropriate action on potential problems |
| | | 3.4 | Arrange for workforce development and training for self and others, as required, in relevant competitive systems and practice procedures and techniques |
| | | 3.5 | Guide others in relating identified problems to the maintenance strategy, and developing any required changes, to ensure awareness, learning and commitment |
| 4 | Implement process and organisation improvements | 4.1 | Plan the implementation of work group suggestions and externally suggested improvements |
| | | 4.2 | Facilitate commitment to, and involvement in, the implementation planning of improvements and to follow improvements to their conclusion |
| | | 4.3 | Encourage the application of the 'plan, do, measure, improve, control' approach to the job |
| | | 4.4 | Arrange for workforce development and training, as required, to facilitate continued involvement by others in improvement processes |
| | | 4.5 | Involve work group and other key personnel in identification of skill needs and means of skills acquisition to fill any identified gaps |

Required Skills and Knowledge

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

Required skills

Required skills include:

- facilitating goals, activities, communications and access to resources, including process mapping
- solving problems
- identifying waste (muda)
- data gathering and analysis
- explaining and leading others in implementation at the work group level of:
 - value stream mapping
 - 5S
 - Just in Time (JIT)
 - mistake proofing
 - process mapping
 - establishing customer pull
 - kaizen and kaizen blitz
 - setting of key performance indicators (KPIs)/metrics
 - identification and elimination of waste (muda)
- communicating effectively to conduct informal and formal meetings, and to relate to personnel at all levels
- providing effective feedback
- effectively encouraging team spirit and morale
- transferring knowledge and skills through informal one-on-one mentoring

Required knowledge

Required knowledge includes:

- information technology systems used in the organisation
- principles of competitive systems and practices and their application to the organisation, including:
 - value stream mapping
 - 5S
 - JIT
 - mistake proofing
 - process mapping
 - establishing customer pull
 - kaizen and kaizen blitz

- setting of KPIs/metrics
- identification and elimination of waste (muda)
- monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP), and proprietary systems, which may be used within the organisation
- methods of gathering data against KPIs, such as:
 - waste walk
 - document tagging
 - tracking/log sheets
 - spaghetti diagrams
 - existing information technology and enterprise resource systems (e.g. SCADA, ERP and MRP)
- facilitation techniques to encourage team development and improvement
- organisational policies, plans and procedures

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none">• identify processes and products of their organisation and work area• analyse current and future skill development needs of team• act as an effective communication link between team and internal and external competitive systems and practices specialists and managers• lead team in identifying efficiency improvements and elimination of waste.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none">• workplace procedures and plans relevant to work area• specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to

	<p>the assessee</p> <ul style="list-style-type: none"> • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	Competitive systems and practices may include, but are
--	--

	<p>not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as SCADA software, ERP systems, MRP and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Budgets	<p>Budgets include:</p> <ul style="list-style-type: none"> • financial • time • materials/products • other business plans which are relevant to the team and the work area
Waste	<p>Waste (also known as muda in the Toyota Production System and its derivatives) is any activity which does not contribute to customer benefit/features in the product. Categories of waste include:</p>

	<ul style="list-style-type: none">• excess production and early production• delays• movement and transport• poor process design• inventory• inefficient performance of a process• making defective items• activities which do not yield any benefit to the organisation or any benefit to the organisations customers
Key reliability issues	<p>Key reliability issues include those which are most likely to lead to failure, such as:</p> <ul style="list-style-type: none">• cleanliness• poor lubrication• incorrect adjustment• poor training and instructions for employees

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403013A Lead team culture improvement

Modification History

New unit, superseding MSACMC413A Lead team culture improvement - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by a team leader or other person responsible for developing a culture within a team appropriate for supporting competitive systems and practices.

Application of the Unit

This unit applies where an organisation has embarked on competitive systems and practices and a team leader or other responsible person is required to change or improve the team culture to be consistent with that required to maximise the benefits from competitive systems and practices.

This unit requires the application of skills associated with communication, teamwork, problem solving, initiative and enterprise, planning and organising, and self-management in order to provide leadership in a changing team environment. This unit has a strong emphasis on planning and change management, but also requires an ability to learn from experience and feed new information back into strategies to improve performance.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a

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

unit of competency. text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Facilitate the team's understanding of the competitive systems and practices strategy	1.1	Communicate with all team members the objectives and benefits of the competitive systems and practices strategy
		1.2	Review with team members the techniques and methods that will be used in achieving the competitive systems and practices strategy
		1.3	Using a systems approach, help team members understand how the team fits into the organisation
		1.4	Establish appropriate communication and teamwork within the team and with other teams
		1.5	Develop a work structure with the team that allows for everyone to participate in the application of the competitive systems and practices strategy
2	Facilitate application of knowledge about the importance of controlling variation in competitive systems and practices	2.1	Develop the application of a statistical approach by all team members to all relevant facets of the system with a view to reducing variation
		2.2	Encourage the approach of building quality and ensuring team members assist each other in meeting requirements
3	Facilitate the development of skills and knowledge within the team	3.1	Encourage appropriate training for all team members
		3.2	Involve team members in identification of skill needs and skill gaps, and in development of a strategy for training, skills acquisition and self-improvement so as to ensure awareness, learning and commitment

4	Facilitate the development of commitment within the team to the competitive systems and practices strategy	4.1	Ensure that the team has sufficient resources and adequate equipment available to meet the requirements of the competitive systems and practices strategy
		4.2	Encourage the adoption of continuous improvement
		4.3	Encourage employee acceptance of responsibility for the quality of their own work
		4.4	Provide continuous feedback and communication of progress at all levels in implementing the strategy
		4.5	Involve team members in relating identified problems and opportunities for improvement to the competitive systems and practices strategy, and involve them in developing any required changes, to ensure awareness, learning and commitment
		4.6	Establish and monitor indicators of team culture

Required Skills and Knowledge

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

Required skills

Required skills include:

- identifying and interpreting team quality standards and customer requirements
- identifying the competitive operational practices being implemented by the team
- communicating with others in the team, other team leaders, other employees and external representatives relevant to team competitive systems and practices
- ensuring team awareness of performance against requirements (e.g. through visual management techniques)
- facilitating team competitive systems and practices review activities
- solving problems to root cause
- identifying and accessing sources of assistance if difficulty is experienced with team implementation of competitive systems and practices
- interpreting relevant procedures and instructions
- identifying, analysing and evaluating information from a variety of sources

Required knowledge

Required knowledge includes:

- competitive systems and practices strategies at a broad level, including theoretical concepts of one or more of:
 - six sigma
 - lean manufacturing/lean operations
 - agile manufacturing/agile operations
 - Just in Time (JIT)
 - supply chain management
 - value stream management
 - total quality
 - proactive maintenance
 - elimination of waste
 - Balanced Scorecard
 - 5S housekeeping
 - visual factory/visual operations
- benefits of:
 - standardised work
 - customer pull
 - value stream mapping
- principles of change management

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none">• identify the competitive systems and practices used by the team• identify changes to their own work flowing from the implementation of the relevant competitive systems and practices• implement and monitor changes designed to improve team culture• know when and how to seek assistance
---	---

	<ul style="list-style-type: none"> • make suggestions for improvements.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Variation	<p>Variation refers to:</p>

	<ul style="list-style-type: none"> variation from quality standards and customer requirements as expressed in production or operations schedules and technical specifications
Systems approach	<p>A systems approach enables a person to see how work gets done, the effect of changes and shows the internal/external relationships through which products and services are produced. It may include considerations of the role and requirements of:</p> <ul style="list-style-type: none"> customers suppliers employees other value stream members members of the public and community groups other external individual, group or organisation technical processes and equipment statutory and regulatory requirements, including occupational health and safety (OHS) and environment legislation and regulations quality standards
Team culture	<p>Team culture change is the extent to which the culture of the team is aligned to the goals of customers and the organisation. Team culture may be monitored by:</p> <ul style="list-style-type: none"> surveys evaluation of toolbox or other regular meetings direct discussion with team members monitoring of other indicators (e.g. error rates and absenteeism) analysis of root cause related to status of team culture
Work structures	<p>The work team structure may vary (e.g. be self-directed, cross-functional, and so on, and should be appropriate to the job)</p>

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403030A Improve cost factors in work practices

Modification History

New unit, superseding MSACMT430A Improve cost factors in work practices - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to evaluate the product or process outcomes of a team in terms of their cost components and to be able to determine, in general terms, the cost impacts of alternative actions.

Application of the Unit

This unit applies to a person who is required to assess the relative costs of alternatives and use this as one of the key factors in decision making. Typical decisions include the efficient organisation of own work and that of others in a work area or within a team and the improvement of throughput and cycle times.

Decisions are made within the scope of the authority of the individual and other employees in the area or team and according to procedures.

This unit primarily requires the application of skills associated with communication and information gathering, teamwork and problem solving to analyse the cost components of work processes. Initiative and enterprise, and planning and organising are also required to identify opportunities for improved cost-efficiency. This unit also requires a degree of self-management and learning to effectively operate and maintain skills and performance.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Analyse cost components of work area or team function	1.1	Identify cost components in the product or process
		1.2	Identify costs factors under control of area or employees in the team
		1.3	Identify causes of variability in costs
		1.4	Analyse impact of costs on production or process activities undertaken
2	Improve cost-efficiency of processes and procedures	2.1	Identify methods of improving productivity and/or reducing costs within area or team's responsibility
		2.2	Determine cost/benefit ratio of alternative methods of improving productivity and/or reducing costs
		2.3	Consult with all relevant stakeholders regarding possible changes
		2.4	Recommend changes which will increase productivity and reduce cost and variability
		2.5	Implement recommended changes in consultation with relevant stakeholders

Required Skills and Knowledge

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

Required skills

Required skills include:

- identifying fixed and variable costs in products or processes
- analysing costs and determining those that can be controlled by the individuals in an area or team
- analysing costs over time and identifying variability in cost components
- determining cost/benefit ratios
- communicating and negotiating with others on changes using a variety of mediums

Required knowledge

Required knowledge includes:

- cost components of products made
- costs concepts, such as expense, income and cost/benefit
- major cost contributors to product (e.g. energy, materials, labour and distribution, and so on) depending on the product and process)
- the difference between internally and externally controlled costs
- difference between overhead, labour and consumables

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none">• identify the scope of their own work and the team or area work and relate it to the overall flow of work in the organisation• express cost factors in specific terms (e.g. cost per item, process and task)• identify and express cost factors in basic financial terms• analyse variability in costs and recommend improvements• use cost/benefit to select preferred improvement strategies.
Context of and specific resources	Assessment of performance must be undertaken in a

for assessment	<p>workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace project(• suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices, • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Cost components	<p>Cost components may include:</p>

	<ul style="list-style-type: none"> fixed and variable costs, such as power/energy, materials, plant and equipment, salary and wages, and office expenses (e.g. telephone) government taxes and charges
Variability in costs	<p>Variability in costs should be assessed over a suitable time. The time should be sufficient to identify:</p> <ul style="list-style-type: none"> fluctuations in variable costs related to different volumes of sales, production or operations abnormal cost fluctuations due to poor design of product or process, poor scheduling, faults, breakdowns and other waste
Process	<p>Process includes all functions that go to meet customer requirements as well as other required functions (e.g. regulatory related functions). Examples include:</p> <ul style="list-style-type: none"> design production maintenance logistics office processes
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> work instructions standard operating procedures drawings and specifications manuals formulas/recipes batch sheets temporary instructions and similar instructions provided for the smooth running of the organisation good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) government regulations <p>Procedures may be:</p> <ul style="list-style-type: none"> written, verbal, computer based or in some other format
Benefits	<p>Benefits should include:</p> <ul style="list-style-type: none"> positive benefits as well as negative benefits, such as quality, safety, reliability and similar issues which may be impacted by a cost saving

Unit Sector(s)

Unit sector	Competitive systems and practices
-------------	-----------------------------------

Custom Content Section

Not applicable.

MSS403040A Facilitate and improve implementation of 5S

Modification History

New unit, superseding MSACMT440A Lead 5S in a manufacturing environment - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to facilitate the implementation and improvement of the 5S by self and others in a team or work area.

Application of the Unit

This unit applies to individuals who facilitate 5S in a team or work area, including implementation, monitoring and improvement. The facilitation may be undertaken by formally designated supervisory staff, such as team leaders or other individuals in a competitive systems and practices implementation role, who need to provide support and encouragement to others to facilitate the achievement of 5S outcomes in the workplace.

This unit requires the application of skills associated with communication, teamwork, problem solving, initiative and enterprise, planning and organising, and self-management in order to provide leadership in a 5S environment. This unit has a strong emphasis on planning and change management, but also requires an ability to learn from experience and feed new information back into strategies to improve performance.

For planning, implementing and leading the application of 5S in an office environment see unit *MSS403039A Facilitate and improve 5S in an office*.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Facilitate the set-up of 5S	1.1	Assist others to determine what are necessary and unnecessary items in the work area
		1.2	Assist others to determine optimum assigned location for all necessary items
		1.3	Liaise with relevant production and occupational health and safety (OHS) personnel in determining optimum locations
		1.4	Assist others to determine optimum location for unnecessary items
		1.5	Assist others to determine 5S schedule
		1.6	Ensure procedures reflect 5S practices
		1.7	Assist others to achieve the required level of skill
2	Facilitate the implementation of 5S	2.1	Ensure procedures reflect 5S practices
		2.2	Assess skill base of team or work group members in 5S and arrange for any required training
		2.3	Ensure that any damage and/or safety risks reported by the team or work group are addressed through correct mechanisms
3	Monitor 5S	3.1	Check work area for 5S implementation as part of normal routine

- | | | |
|---|------------|--|
| | 3.2 | Identify non-conformances |
| | 3.3 | Negotiate solutions to non-conformances |
| 4 | Improve 5S | |
| | 4.1 | Work with others to find areas for improvement |
| | 4.2 | Assist others to develop improvement solutions |
| | 4.3 | Facilitate the availability of resources required for the improvement solution |
| | 4.4 | Facilitate the implementation of the improvement solution |

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with other employees and managers to engender commitment to achieving 5S outcomes, conduct formal and informal meetings and to explain 5S and related concepts
- facilitating team or work area goals, activities and communications and accessing resources
- visualising normal operational procedures in terms of flow and contribution to customer outcomes
- planning and prioritising activities
- problem solving to determine potential improvements to the 5S system
- reading and interpreting the application of operating procedures for jobs within team or target work area
- analysing work practices, procedures and 5S principles to facilitate setting up the 5S system and to identify improvements
- identifying gaps in skills and/or knowledge and options to address them

Required knowledge

Required knowledge includes:

- principles and purpose of 5S
- methods of identifying waste in the work area, such as:
 - waste walk
 - document tagging
 - tracking/log sheets
 - spaghetti diagrams
- existing information technology and enterprise resource systems (e.g. Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems
- organisational policies, plans and procedures
- processes for identifying and addressing skill gaps
- ways of encouraging team members to find and suggest areas for improvement
- methods of identifying and evaluating options and making/recommending improvements
- methods of accessing required resources
- OHS requirements relevant to team and work area

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • identify the scope of the services and/or functions supplied to and by the team or work area and the deliverables expected by customers, including the ultimate customer • facilitate a systematic approach to implementing 5S • lead and motivate others in achieving 5S outcomes and making improvements to the 5S systems • set up systems for monitoring and improving 5S implementation • manage non-conformances in implementation of 5S.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p>

	<ul style="list-style-type: none"> workplace procedures and plans relevant to work area specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee documentation and information in relation to production, waste, overheads and hazard control/management reports from supervisors/managers case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> demonstration in the workplace workplace projects suitable simulation case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) targeted questioning reports from supervisors, peers and colleagues (third-party reports) portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with

training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as SCADA software, ERP systems MRP and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant

	<ul style="list-style-type: none"> • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and Responsible Care) • government regulations <p>Procedures may be:</p> <ul style="list-style-type: none"> • written, verbal, computer-based or in some other format
5S	<p>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:</p> <ul style="list-style-type: none"> • sort • set in order • shine • standardise • sustain
Sort	<p>Sort involves keeping only what is absolutely necessary for the work processes that comprise the job and includes:</p> <ul style="list-style-type: none"> • clearing the work area of all non-essential items <p>Non-essential items are items not required to either produce product, conduct process or operations or make required adjustments to equipment during process or operations</p>
Set in order	<p>Set in order includes:</p> <ul style="list-style-type: none"> • assigning required equipment and materials appropriate locations in the work area
Shine	<p>Shine includes:</p> <ul style="list-style-type: none"> • keeping the work area clean at all times. This should be carried out to a regular daily schedule against allowed time, usually at the end of the day or of a particular process <p>Cleaning includes:</p> <ul style="list-style-type: none"> • noting any signs of wear, damage, leakage, safety risks or other issues that require immediate attention
Standardise	<p>Standardising includes:</p> <ul style="list-style-type: none"> • activities that help maintain the order and the housekeeping standards • using procedures and checklists developed from a procedure

Sustain	<p>Sustain includes:</p> <ul style="list-style-type: none"> • making sure that daily activities are completed every day regardless of circumstance • undertaking inspections, including: <ul style="list-style-type: none"> • informal inspections that should be carried out often, at least weekly • generating continuous improvement actions from daily activities • formal inspections that should be carried out at least monthly
Items in work area	<p>Items in work area may include:</p> <ul style="list-style-type: none"> • tools • jigs/fixtures • materials/components • plant and equipment • manuals • personal items (e.g. bags, lunch boxes and posters) • safety equipment and personal protective equipment • other items which happen to be in the work area
Team	<p>The term team is used to apply to all individuals in the target work area who are involved in the implementation of 5S. The team may or may not be a formally designated team working to a team leader</p>
Work area	<p>The work area includes:</p> <ul style="list-style-type: none"> • all areas where aspects of the job are performed and that are under the direct control of the employee. In a team environment 5S should be applied to all work areas under the control of the team
Target work area	<p>The target work area may be identified as a physical and/or virtual work space:</p> <ul style="list-style-type: none"> • used by a person, a team or a cross-functional group • common to part/s of a process or value stream (already defined) • shared by people who undertake a defined procedure or set of procedures • needed to support a particular function
Appropriate place	<p>Appropriate places may include areas designated for:</p> <ul style="list-style-type: none"> • recycling • rubbish removal

	<ul style="list-style-type: none">• staff room/lunch room/kitchen• storage• holding area until status is confirmed
Optimum assigned location	The optimum assigned location may include: <ul style="list-style-type: none">• making changes to the layout of furniture, equipment and personnel in order to facilitate the smooth and continuous flow of work through process steps taking into account OHS considerations
Non-conformance	Non-conformance includes: <ul style="list-style-type: none">• incorrect or incomplete application of 5S procedures, including any daily tasks, scheduled inspections and continuous improvement procedures

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403041A Facilitate breakthrough improvements

Modification History

New unit, superseding MSACMT441A Facilitate continuous improvement in manufacturing -
Not equivalent

Unit Descriptor

This unit of competency covers the knowledge and skills required to facilitate implementation of discrete targeted improvement activities to achieve breakthrough improvements in selected processes, operations or products. Typically this approach is used for improvements in areas of waste identified through value stream mapping.

Application of the Unit

This unit applies to team leaders and others who are providing guidance and support to assist a team of employees to identify improvements that can be implemented to operations, processes or products in a brief intensive project.

The unit also covers ensuring that the improvements are sustained. The process of achieving breakthrough improvements is often called kaizen blitz in lean terminology.

This unit assumes that one or more processes and operations have been mapped.

MSS403033A Map an operational process may also need to be selected if this is not the case.

For facilitation of breakthrough improvements in an office see unit *MSS403043A Facilitate breakthrough improvements in an office*.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

- | | | |
|---|-------------------------------|---|
| 1 | Prepare for improvement event | <p>1.1 Engage team members in the improvement event</p> <p>1.2 Identify process or processes to be targeted in the improvement event</p> <p>1.3 Assist team members to identify how their own roles contribute to value to the customer</p> <p>1.4 Assist team to identify the boundaries of the event, including any imposed exclusions</p> <p>1.5 Identify key process indicators and other information required for improvement event</p> <p>1.6 Identify skill needs for personnel engaged in breakthrough improvement event and arrange for any required training</p> <p>1.7 Establish communication processes with sponsor and stakeholders</p> |
| 2 | Identify improvements | <p>2.1 Assist team to review current processes, operations or products and identify options for radical improvements</p> <p>2.2 Facilitate team activities and other relevant personnel to evaluate the options and agree on improvements to be made</p> <p>2.3 Encourage and assist team and others to plan the activities and identify metrics to be monitored</p> <p>2.4 Facilitate allocation of resources and strategies to manage impact on routine work</p> |

- | | | | |
|---|-----------------------|-----|--|
| 3 | Facilitate the event | 3.1 | Assist team to gather baseline data on the selected metrics |
| | | 3.2 | Assist team to identify and address barriers to making the improvements |
| | | 3.3 | Monitor team dynamics and facilitate team focus and cooperation |
| | | 3.4 | Liaise with sponsor to communicate progress and maintain their support |
| 4 | Evaluate improvements | 4.1 | Assist team to gather and interpret data on the metrics |
| | | 4.2 | Facilitate team activities to evaluate the outcomes of the event |
| | | 4.3 | Identify causes for areas of poor performance from changes and identify any additional changes to address them |
| | | 4.4 | Report to sponsor and other stakeholders on the outcomes of the event |
| 5 | Embed improvements | 5.1 | Establish mechanisms to ensure new systems and/or practices are communicated to relevant personnel |
| | | 5.2 | Motivate team to apply the new systems and/or practices and sustain improvements |
| | | 5.3 | Ensure the new systems and/or practices are reflected in relevant procedures |

Required Skills and Knowledge

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

Required skills

Required skills include:

- facilitating groups of people who may not normally work together
- analysing information and data to identify variation and evaluate improvements
- measuring and calculating performance variables
- facilitating team goals, activities, communications and accessing resources
- planning and prioritising team activities
- solving problems to root cause
- identifying waste (muda)
- communicating with personnel at all levels in relation to team activities and improvement projects
- visualising normal operations and procedures in terms of flow and contribution to customer value
- contributing to procedure review and/or development
- identifying gaps in skills and/or knowledge and options to address them

Required knowledge

Required knowledge includes:

- team and organisation deliverables and processes used to achieve them
- how organisation operations and processes contribute to the value stream
- types of waste (muda) and imposed exclusions
- organisational policies, plans and procedures
- methods of identifying and evaluating options
- occupational health and safety (OHS) requirements relevant to the target work areas

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • interpret operations, processes and products in terms of value to the customer • identify, analyse and evaluate information from a variety of sources to identify opportunities for breakthrough improvements • lead and motivate others in planning, implementing and sustaining improvements.
Context of and specific resources	<p>Assessment of performance must be undertaken in a</p>

for assessment	<p>workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Team	<p>Team for the purposes of this unit means any group of employees engaged in a breakthrough improvement</p>

	<p>event. Examples include:</p> <ul style="list-style-type: none"> • a permanent formally identified team • a sub-group of a team • a specially established group for the breakthrough event (e.g. a combined production/administration/logistics group convened for a breakthrough event addressing delivery issues)
Scope and benefit statements	<p>Scope and benefit statements of improvement project may include:</p> <ul style="list-style-type: none"> • description of the business • the target work process • what key stakeholders seek from the improvement project • a mission for the event • a set of goals • a statement of the do's and don'ts for the improvement project
Boundaries	<p>Boundaries define the extent and limits of the breakthrough improvement event. Typically they define:</p> <ul style="list-style-type: none"> • the start and end point of the process being targeted • the steps of the process to be included and excluded • specific job roles or related processes to be included or excluded • timeframe for the event
Sponsor	<p>Sponsor includes:</p> <ul style="list-style-type: none"> • a person who is committed to achieving improvements and who has the authority to approve and allocate resources to support the activities and ensuing changes. Typically the sponsor will be a middle or senior manager in the organisation or the business owner
Breakthrough improvement	<p>A breakthrough improvement (also known as kaizen blitz) is one that delivers a better ratio of value-add to non-value add from the customer perspective. It is characterised by:</p> <ul style="list-style-type: none"> • using a formal process • being a discrete targeted activity that is achieved in a relatively short timeframe • delivering significant level of improvement
Mechanisms	<p>Mechanisms to communicate and sustain improvements may include:</p>

	<ul style="list-style-type: none"> • scheduled audits • regular monitoring and/or reporting activities • use of visual aids, such as targets and progress boards, process charts and procedure posters • communications, such as standing items for team meetings, email reminders or updates
Imposed exclusions	<p>Imposed exclusions are wastes (muda) that are required but do not add value. They should be formally identified as muda in the competitive systems implementation. Examples include:</p> <ul style="list-style-type: none"> • equipment excluded from efficiency or layout review because of budget constraints • regulatory requirements that do not add value • organisation requirements, policies or procedures beyond the influence of the team
Key process indicators	<p>Key process indicators may include:</p> <ul style="list-style-type: none"> • statistical process control data/charts • orders • lost time, injury and other OHS records • equipment reliability charts
Team	<p>Team includes:</p> <ul style="list-style-type: none"> • formally designated teams • informal groups of employees • other stakeholders who may be brought together for a breakthrough improvement event

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS403051A Mistake proof an operational process

Modification History

New unit, superseding MSACMT451A Mistake proof a production process - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to make changes to own and others work in a work area which prevents errors and/or backsliding to a pre-improvement level of practice.

Application of the Unit

This unit applies to a person who needs to analyse a process that a team is responsible for and determine methods of mistake proofing it (e.g. ensuring it only produces product within an acceptable range or error-free transport and storage of goods). The person will typically be a technical expert, team leader or be in a role where they have sufficient technical understanding of processes in their own work and that of others to be able to mistake proof the production process in their area. After improvement activities have been undertaken these improvements need to be sustained.

This unit requires the application of skills associated information gathering and analysis. Initiative, enterprise and problem solving are also required to identify mistakes and determine strategies for eliminating them. This unit also requires communication and teamwork skills to ensure mistake proofing strategies are implemented and self-management and learning skills to continually reflect on and integrate feedback about the effectiveness of strategies.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Analyse process	1.1	Identify sources of variability/non-conformance in the process
		1.2	Identify critical control points in process
		1.3	Analyse causes of variability/non-conformance
2	Develop preventative techniques/systems	2.1	Liaise with team members and other people to develop mistake proof options for performing operation
		2.2	Test and validate mistake proofing options
3	Implement permanent fix	3.1	Liaise with relevant people to have systems/procedures changed to implement solution
		3.2	Liaise with relevant people to implement the solution
		3.3	Liaise with relevant people to ensure self and others in the team or work area have an appropriate skills set
		3.4	Follow through to ensure implementation occurs
4	Monitor implementation	4.1	Critically observe the implementation
		4.2	Compare the results of the implementation against the expected outcomes
		4.3	Modify solution to improve outcomes

		4.4	Ensure procedures reflect change
		4.5	Ensure training/assessment reflects change
		4.6	Audit change at agreed period/cycle
		4.7	Take action on any observed deviation
5	Seek improvements	5.1	Observe changes
		5.2	Analyse process again, if required, to ensure improvements are sustained

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with team or work group members, technical support personnel and other relevant staff
- explaining mistake proofing and related concepts
- facilitating input of others and encouraging acceptance of changes
- analysing and visualising operations in terms of flow and contribution to customer outcomes
- solving problems to determine root cause of errors and possible solutions
- analysing and interpreting information about errors and mistake proofing options in terms of cost, feasibility, regulations and value to the customer
- suggesting design changes to operations and products that eliminate the potential for errors
- suggesting mechanisms or procedures that warn of errors where operations cannot be designed to eliminate errors,

Required knowledge

Required knowledge includes:

- mistake proofing concepts, including, in priority order:
 - eliminate the possibility of the error via changes to the process
 - prevent the error from occurring via physical or virtual barriers
 - reduce likelihood of the error by encouraging correct action

- mitigate the impact of the error if it does occur
- understanding of processes undertaken by team
- factors in the processes which may cause variability
- methods of controlling the variability in the process
- mistake proofing methods relevant to the process/product

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • analyse variability and non-conformances • identify, analyse and evaluate information from a variety of sources to identify errors and options for mistake proofing • facilitate implementation of mistake proofing activities that reduce waste • facilitate sustaining the mistake proofing activities.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace

	<ul style="list-style-type: none"> • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related
--	---

	<p>operations control systems</p> <ul style="list-style-type: none"> • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Mistake proofing	<p>Mistake proofing is based on the concept of zero defects. The first priority is to eliminate the possibility of an error occurring. However, where this is not feasible mistake proofing can be used to reduce the occurrence of errors and/or to minimise their impact.</p> <p>Mistake proofing should target an error in the following priority order:</p> <ul style="list-style-type: none"> • eliminate the possibility of the error via changes to the process • prevent the error from occurring via physical or virtual barriers, • reduce likelihood of the error by encouraging correct action (e.g. through warning systems) • mitigate the impact of the error if it does occur <p>Mistake proofing is also called error proofing or baka-yoke or poka-yoke</p>
Options for mistake proofing	<p>Factors to consider when prioritising options for mistake proofing will vary according to the process and may include:</p> <ul style="list-style-type: none"> • success rate in eliminating errors

	<ul style="list-style-type: none">• feasibility• skills required by employees• cost• capacity to reduce waste
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none">• all work instructions• standard operating procedures• formulas/recipes• batch sheet• temporary instructions and similar instructions provided for the operation of the plant• good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care)• government regulations <p>Procedures may be:</p> <ul style="list-style-type: none">• written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS404050A Undertake process capability improvements

Modification History

New unit, superseding MSACMT450A Undertake process capability improvements* - Equivalent

* New prerequisite *MSS404052A Apply statistics to operational processes* superseding MSACMT452A Apply statistics to processes in manufacturing

Unit Descriptor

This unit of competency covers the skills and knowledge required to make process capability improvements, including analysing data from the process, developing improvements to eliminate variation due to assignable causes, and then implementing actions.

Application of the Unit

This unit applies to a person who reviews a range of process capability data and information, makes/arranges for changes to be made to procedures, equipment or process and then recalculates the process capability and monitors resulting improvement actions. The person will typically be a technical expert, team leader or be in a role where they have sufficient technical understanding of processes in their own work and that of others to be able to suggest and justify process capability improvements.

Process capability may have been determined using either a six sigma or three sigma processes. This unit applies to the application of statistical methods and the determination of capability based on those methods. Other related units may be *MSS404052A Apply statistics to operational processes* and *MSS404053A Use six sigma techniques*

This unit primarily requires the application of skills associated with communication, information gathering and analysis. Initiative, enterprise and problem solving are also required to identify opportunities to improve process capacity. This unit also requires aspects of self-management and learning to validate own analysis.

For a qualitative approach to improvement (one not using statistics) see *MSS403051A Mistake proof an operational process*.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MSS404052A Apply statistics to operational processes

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Obtain required data	1.1	Identify process for study
		1.2	Obtain/organise process to obtain required data/information
2	Analyse information	2.1	Analyse data and determine assignable causes
		2.2	Develop possible improvements to eliminate assignable causes
		2.3	Incorporate own experience and learning into proposed process improvement proposals
		2.4	Develop process improvement proposals
3	Improve process capability	3.1	Obtain required authorities to implement improvements
		3.2	Liaise with relevant people to implement improvements
		3.3	Obtain/organise required data for improved process

- 3.4 Recalculate process capability
- 3.5 Implement revised data collection/processing and new capability information
- 3.6 Monitor improvement actions and make adjustments, as necessary

Required Skills and Knowledge

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

Required skills

Required skills include:

- performing relevant mathematical operations
- identifying and using relevant statistical methods
- communicating and explaining data- related changes and procedures to individuals and groups
- negotiating with other employees and managers on proposed improvement actions
- analysing procedures and data to establish variation
- solving problems to root cause where assignable cause of variation is not obvious
- working in a team
- using computer software relevant to required analyses and process

Required knowledge

Required knowledge includes:

- data collection methods
- data processing techniques required
- variability and normal distribution
- three sigma or six sigma processes, as relevant
- random and non-random results (recognition of assignable causes)
- causes of different types of non-random results
- causes of random variation
- process understanding sufficient to translate the data into variations in the process and determine methods of controlling them

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • analyse process information • calculate process capability/trial limits • improve process capability (or organise for it to be improved) • analyse revised process information and recalculate process capability.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence <p>In all cases it is expected that practical assessment will</p>

	<p>be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time
--	--

	<ul style="list-style-type: none"> • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Process capability	<p>Process capability is:</p> <ul style="list-style-type: none"> • the measurable ability of a process to reliably produce within calculated limits (the limits depend on the variation of the process)
Variation	<p>All processes have variation. The approach in this unit is to separate random variation (no assignable cause) from non-random variation (which has an assignable cause). By finding and eliminating assignable causes, total variation is reduced and process capability will be improved</p>
Six sigma	<p>Six sigma refers to:</p> <ul style="list-style-type: none"> • a statistical tool for recording defects and determining capability. Six sigma limits equate to 3.4 defects per million opportunities for each product or service transaction. Six sigma is also used as a general term covering a competitive systems and practices approach. Six sigma training typically covers several units of competency in this Training Package
Three sigma	<p>Three sigma refers to:</p> <ul style="list-style-type: none"> • a traditional statistical process control. Three sigma limits equate to 3 defects per thousand opportunities for each product or service transaction
Required data	<p>The calculation of three sigma or six sigma limits requires process data. The data required depends on the nature of the limits being calculated</p>
Assignable cause	<p>Any non-random variation is said to have an ‘assignable cause’. The methods of data analysis common to statistical capability analysis as well as other methods of</p>

	root cause analysis should be used to determine the cause of this non-random variation
Improved process capability	<p>Improvements to process capability result from eliminating the causes of non-random variation. The improvements made may be:</p> <ul style="list-style-type: none">• as a result of continuous improvement with the process capability being recalculated periodically• as a result of an improvement project with the process capability recalculated as part of that project
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none">• work instructions• standard operating procedures• formulas/recipes• batch sheets• temporary instructions and similar instructions provided for the smooth running of the plant• good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care)• government regulations <p>Procedures may be:</p> <ul style="list-style-type: none">• written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS404052A Apply statistics to operational processes

Modification History

New unit, superseding MSACMT452A Apply statistics to processes in manufacturing - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to apply statistical theory and principles to the analysis and control of processes and operations.

Application of the Unit

This unit applies to a person working in an organisation applying statistical process control on processes or operations. The statistical process control will usually be used to monitor the processes or operations and determine when action needs to be taken. The appropriate action will then be taken in accordance with standard procedures.

The unit includes applying knowledge of frequency distribution and variation to the data/chart to distinguish between random and non-random variation and assumes understanding of the process and/or equipment to help interpret those results.

This unit primarily requires the application of skills associated with gathering and analysing data and communicating statistical information to others. This unit also has a strong emphasis on problem solving, initiative and enterprise, planning and organising, and self-management to solve problems and manage processes.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Collect process data	1.1	Interpret sampling scheme
		1.2	Obtain measurements in accordance with standard procedures
		1.3	Handle data, as required
2	Interpret data	2.1	Plot data on appropriate control chart
		2.2	Distinguish between random and non-random patterns of results
		2.3	Identify results outside the control limits
		2.4	Recognise situations requiring action
		2.5	Take appropriate action in accordance with standard procedures
		2.6	Determine cost of non-conformance
3	Calculate control limits	3.1	Consult relevant stakeholders to determine appropriate limits
		3.2	Use relevant methods to calculate/revise control limits
		3.3	Plot limits on control chart
		3.4	Explain impact of limit to relevant stakeholders

Required Skills and Knowledge

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

Required skills

Required skills include:

- applying a range of sampling procedures
- analysing samples and data for variation, relevance, reliability and representativeness
- problem solving the causes of variation in a process
- communicating with other employees to obtain samples/data and to explain results and limits
- plotting or documenting results
- undertaking calculations, including:
 - basic arithmetic functions
 - mean, range, mean of means, standard deviation (using appropriate calculation aids)
- using statistics to support process and operations control

Required knowledge

Required knowledge includes:

- sampling techniques
- purpose of sampling and measurement
- random, systematic and stratified sampling
- purpose of replication of data for statistical control
- samples, populations, finite and infinite populations and the differences
- methods of calculating means, standard deviations and the like and their purpose in statistical control
- the meaning of broad/narrow frequency distributions/range/standard deviations and skewed distributions in process terms
- concept of limits, including:
 - 1 sigma warning limits
 - 2 sigma warning limits
 - 3 sigma control limits
 - 6 sigma limits
- types of control charts and their applications to different types of process/product and for different purposes
- process causes of variation and typical cause types of non-random variation
- non-process (e.g. measurement) causes of variation
- recognition of stable and unstable processes
- causes of stability/instability in the process

- calculation of control limits/process capability and the applications of different control limits
- the standard distribution curve and confidence limits

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • follow sampling procedures • apply basic statistical processes • analyse data to identify variations and non-conformances • plot or document results.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning

	<ul style="list-style-type: none"> • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen)
--	--

	<ul style="list-style-type: none"> • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Sampling scheme	<p>Sampling scheme may include:</p> <ul style="list-style-type: none"> • 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	<p>Procedures may include:</p> <ul style="list-style-type: none"> • work instructions • standard operating procedures • formulas/ recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations <p>Procedures may be:</p> <ul style="list-style-type: none"> • written, verbal, computer-based or in some other

	format
Handle data	<p>Handle data may include:</p> <ul style="list-style-type: none"> • calculating means, ranges, mean of means and standard deviations (using appropriate calculation aids) • entering data into a software package • recording data either in writing or electronically • other required manipulations of the data
Control chart	<p>Control charts may include:</p> <ul style="list-style-type: none"> • run • tally • mean/range • attributes • other relevant charts
Random	Random variation is the term used in statistical control to refer to those variations for which no cause can be found
Non-random	Non-random (also called identifiable cause, assignable cause or special cause) are those variations for which a cause can be found and so the cause of the variation eliminated. Non-random variation may also be used to predict possible breaches of the control limits
Control limits	Control limits (also referred to as process capability) are those limits within which the process will operate if it is 'under control'
Cost of non-conformance	<p>Cost of non-conformance includes:</p> <ul style="list-style-type: none"> • 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:

	<ul style="list-style-type: none">• 1 sigma warning limits• 2 sigma warning limits• 3 sigma control limits• 6 sigma limits
--	---

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS404060A Facilitate the use of planning software systems in a work area or team

Modification History

New unit, superseding MSACMT460A Facilitate the use of planning software systems in manufacturing* - Not equivalent

* Prerequisite *MSACMT260A Use planning software systems in manufacturing* - removed

Unit Descriptor

This unit of competency covers the skills and knowledge required to facilitate the use of planning software in an organisation in a person's work area or team. These systems are known by various generic names, such as Enterprise Resource Planning (ERP), Materials Resource Planning (MRPII, MRP III etc.) or by proprietary names.

Application of the Unit

This unit applies to a person who will access the planning software system for their own work, but will also need to provide support and organise skill development programs for their team or work group members. The person will typically be a technical expert, team leader or be in a role where they have sufficient technical understanding of processes in their own work and that of others to be able to facilitate the use of the planning software system.

The planning software system will be used routinely in the work of the team or work group.

This unit primarily requires the application of skills associated with using communication technology and supporting team use of planning software. Problem solving, initiative and enterprise, and planning and organisational skills are required to ensure that planning software is used efficiently. This requires aspects of learning and self-management to ensure own performance and that of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Identify scope of planning software	1.1	Identify categories of information held by planning software
		1.2	Identify information categories relevant to team and area processes
		1.3	Identify range of information able to be provided to planning software by team or work group
		1.4	Identify range of information able to be provided to team or work group by planning software
2	Communicate using the planning software system	2.1	Send and receive information using planning software
		2.2	Send and receive messages using planning software
3	Make decisions using planning software	3.1	Interrogate the planning software system to find required current, historical or predicted information
		3.2	Take actions appropriate to the information in accordance with procedures
4	Monitor the use of	4.1	Routinely monitor planning software information

	planning software	4.2	Review performance and use of planning software with team
5	Support others to use planning software	5.1	Regularly communicate with team or other work group members, both using planning software and face to face
		5.2	Identify improvements required
		5.3	Take appropriate actions to implement improvements

Required Skills and Knowledge

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

Required skills

Required skills include:

- entering and receiving information via planning software terminals
- communicating with team and organisation planning software support personnel
- engaging and motivating team in use of planning software
- identifying team or work group area information requirements
- identifying scope of information relevant to team and area available in planning software by categories
- planning and organising improvements in team's use of planning software

Required knowledge

Required knowledge includes:

- hierarchy of planning software system and operation
- information available from/through the planning software system
- query facilities and information analysis capabilities offered by planning software
- support/training/skill development mechanisms available for access by team members

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the

performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • identify team or work group area information requirements and relate to planning software categories • lead and motivate others in using planning software • ensure information sent to planning software is accurate and appropriate • obtain regular and one-off information from planning software • make decisions using planning software generated information.
<p>Context of and specific resources for assessment</p>	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
<p>Method of assessment</p>	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence.

	<p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, ERP systems, MRP and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time
--	---

	<ul style="list-style-type: none"> • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Planning software	<p>Planning software is a general term applied to a number of software systems which integrate a range of business information, such as:</p> <ul style="list-style-type: none"> • sales/order taking • finance/accounting • logistics • maintenance • human resources • production <p>It is frequently referred to by names such as ERP or MRP/MRP II. In some cases it can be integrated with engineering applications, such as SCADA systems. In such cases the unit MSS402061A Use SCADA systems in operations may also be required</p>
Information and messages	<p>Information and messages able to be sent and received via the planning software will vary between programs and organisations. This unit assumes that a range of discretion is available to the team leader over the information and messages that can be sent or received. Examples of information and message categories include:</p> <ul style="list-style-type: none"> • orders • production/operations processes • scheduling (e.g. daily/weekly) • finance and accounting • human resources (e.g. rosters, reserves, training completed and scheduled) • quality requirements • customers • suppliers

Value stream	<p>The value stream begins with the customer and includes all actions (both value-adding and non-value added) by both internal sections/departments and external organisations to meet a customer requirement.</p> <p>Depending on the operations and the customer requirement stages where value stream actions may occur include:</p> <ul style="list-style-type: none">• sales outlet/representative• information gathering, data analysis and research• product design• raw material sourcing• intermediate processing• final assembler/collation/preparation• support services (e.g. accounting, finance and legal)• storage and delivery to customer• after market support
---------------------	--

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS404081A Undertake proactive maintenance analyses

Modification History

New unit, superseding MSACMT481A Undertake proactive maintenance analyses - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to undertake the most common forms of analyses associated with predictive/preventative/reliability centred maintenance strategies.

Application of the Unit

This unit applies to a technical expert (usually an engineer, technician or tradesperson) who is required to undertake analyses for the purpose of predictive/preventative/reliability centred maintenance as part of a competitive systems and practices strategy.

This unit primarily requires the application of skills associated with communication, teamwork, problem solving, initiative and enterprise, and planning and organising in order to undertake maintenance analyses. This is normally done in the context of using computer technology, and requires aspects of learning and self-management to ensure team involvement and facilitation of learning.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a

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

unit of competency. text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Liaise with operator	1.1	Establish a relationship with the operator of equipment/plant
		1.2	Ensure the operator has the required skills and resources to keep the equipment/plant clean
		1.3	Ensure the operator is able to effectively monitor the operation of the equipment/plant
		1.4	Regularly communicate with operator about the overall equipment effectiveness (OEE) of their equipment/plant
		1.5	Involve operator, team leader and other key personnel in identification of skill needs and means of skill acquisition to fill any identified gaps
2	Analyse history	2.1	Analyse mean time between failures (MTBF) from maintenance records
		2.2	Analyse performance data of the equipment/plant
		2.3	Identify causes of changes to historic trends/status
		2.4	Determine methods of ensuring causes of improvements and resolution of deterioration are locked in
3	Undertake failure mode effects analysis (FMEA) or similar failure effects analysis	3.1	Undertake analysis
		3.2	Record results of analysis
		3.3	Investigate methods of eliminating possibility of failure and/or minimising the impact of the failure
		3.4	Liaise with operator, team leader and other key personnel regarding possible solutions

		3.5	Select most appropriate solution
		3.6	Implement selected solutions
4	Undertake condition monitoring analysis	4.1	Obtain data for condition monitoring analysis
		4.2	Interpret condition monitoring data
		4.3	Predict required maintenance type and timing from condition monitoring data
		4.4	Liaise with operator, team leader and other key personnel regarding implications of condition monitoring report
		4.5	Involve team members in development of changes to maintenance strategy to ensure awareness, learning and commitment

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with operators and team leaders in a variety of situations and with different media
- adapting personal communication strategy to different levels of operator and team leader literacy and numeracy
- working in formal and ad-hoc teams to undertake proactive maintenance related analyses
- analyse data to determine trends, variations, equipment history and to prioritise methods of eliminating or minimising equipment failure
- solving problems to root cause
- applying basic arithmetic and statistical methods
- planning for effective data collection
- reading and interpreting engineering specifications/drawings
- reading and interpreting charts and diagrams
- using information system terminals and computer
- recording data in hard or soft formats

Required knowledge

Required knowledge includes:

- cleaning needs, techniques and principles of equipment in area of responsibility
- methods of assessing operator and maintenance skill gaps and filling them
- techniques for determining MTBF or similar
- techniques for undertaking FMEA or similar
- underpinning principles of competitive systems and practices strategies being implemented and how to adapt them to maintenance
- root cause analysis
- techniques to analyse condition monitoring data

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • identify and analyse data and other information on the historical performance of equipment • involve operators, maintenance and other stakeholders in decisions on proactive maintenance strategies • identify root cause of failure and deterioration in equipment performance • select and implement failure elimination or minimisation solutions.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to

	<p>production, waste, overheads and hazard control/management</p> <ul style="list-style-type: none"> • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations
--	---

	<ul style="list-style-type: none"> • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • OEE • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
OEE	<p>OEE is the combination of the main factors causing loss of productive capacity from equipment/plant and is:</p> $OEE = availability \times performance \times quality\ rate$ <p>where:</p> <ul style="list-style-type: none"> • availability takes into account losses due to breakdown, set up and adjustments • performance takes into account losses due to minor stoppages, reduced speed and idling • quality rate takes into account losses due to rejects, reworks and start-up waste

MTBF	<p>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.</p> <p>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.</p> <p>Depending on the equipment, operations and procedures of the organisation, alternative statistical records of maintenance and maintenance related events may be substituted for MTBF providing they relate strategies for improving OEE.</p>
FMEA	<p>FMEA is a systematic approach that identifies potential failure modes in a system, product, or operations/assembly operation caused by either design or operations/assembly process deficiencies. It also identifies critical or significant design or process characteristics that require special controls to prevent or detect failure modes. FMEA is a tool used to prevent problems from occurring.</p> <p>Some industry sectors have highly adapted forms of FMEA and may practice traditional FMEA in say their routine maintenance while using another technique, such as Hazard and Operability Studies (HAZOP) for design and modification.</p> <p>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.</p>
Condition monitoring	<p>In this unit condition monitoring is used to describe the process of analysing the implications of condition monitoring data for proactive maintenance, whether it be obtained from non-destructive testing (NDT) reports, visual assessment by experts, diagnostic reports obtained from SCADA or other enterprise or equipment software and product or process quality analyses. It does not require the actual undertaking of the NDT or condition monitoring assessment or test. If this is required appropriate units from other Training Packages will be</p>

	required.
--	-----------

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS404082A Assist in implementing a proactive maintenance strategy

Modification History

New unit, superseding MSACMT482A Assist in implementing a proactive maintenance strategy - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required by a maintenance person to assist in the implementation of a proactive maintenance strategy in an organisation. This unit includes the interaction between a maintenance worker and operators, as appropriate.

Application of the Unit

This unit applies to a maintenance person in an organisation that has adopted or is implementing total preventative/productive maintenance (TPM), reliability centred maintenance (RCM) or similar strategies. As part of this, the maintenance person is expected to assist in the implementation by determining appropriate maintenance related schedules and also by providing maintenance related assistance to non-maintenance personnel, such as assisting production personnel to fulfil their role in the TPM/RCM strategy.

This unit requires the application of skills associated with problem solving and initiative and enterprise in order to analyse maintenance requirements. Communication, teamwork and planning and organising skills will be required to implement reliability strategies. This requires aspects of self-management to ensure improvement of own performance and learning.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Develop components of reliability strategy for a work/plant area	1.1	Determine manufacturer's recommended inspection, servicing and related schedules for relevant plant
		1.2	Consult with relevant people with regard to appropriate inspections, services and schedules
		1.3	Discuss any conflicts with relevant people and seek resolution of conflicts
		1.4	Develop schedules in liaison with relevant people
		1.5	Identify inspections and servicing which may be done by operations personnel in liaison with relevant stakeholders
2	Assess current practice for maintenance implications	2.1	Identify the overall equipment effectiveness (OEE) or other organisation targets for equipment/plant
		2.2	Evaluate procedures for plant/equipment reliability implications
		2.3	Discuss current practices with relevant people to determine any plant/equipment reliability implications
		2.4	Recommend changes to improve plant/equipment reliability in accordance with procedures
3	Assist in implementing the reliability strategy	3.1	Arrange for schedules to be incorporated in relevant work plans
		3.2	Identify training needs in discussion with relevant

personnel

- 3.3 Assist personnel to develop required skills for inspections/servicing within scope of authority
- 3.4 Collect data/information as required by own work plan
- 3.5 Compare data/information with performance indicators
- 3.6 Recommend improvements to reliability strategy in accordance with procedures

Required Skills and Knowledge

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

Required skills

Required skills include:

- explaining concepts and processes of chosen proactive maintenance strategy used by the organisation and distinguishing from traditional (breakdown) maintenance strategies
- communicating with operators, other maintenance personnel, team leaders and technical experts in a variety of situations and using different media
- adapting personal communication strategy to different levels of operator and team leader literacy and numeracy
- working in formal and ad-hoc teams to implement proactive maintenance
- solving problems to root cause
- planning proactive maintenance tasks to fit in with maintenance and production schedules and the needs of other staff
- assessing the ability of operations personnel with regard to inspections and servicing of equipment
- reading and interpreting charts and diagrams, manufacturer manuals and specifications and operating procedures

Required knowledge

Required knowledge includes:

- requirements of the proactive maintenance strategy being implemented
- operating principles and procedures for equipment/plant subject to proactive maintenance strategy
- purpose and processes for data collection in proactive maintenance strategies
- procedures relevant to own job and organisation implementation of proactive maintenance

- methods of making/recommending improvements

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • source information from manuals and other technical documentation or software • effectively communicate with users on equipment operational and maintenance history • develop schedules for maintenance activities including seeking technical assistance, where appropriate • differentiate between proactive and traditional maintenance strategies.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation

	<ul style="list-style-type: none"> • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and
--	--

	<p>analysis</p> <ul style="list-style-type: none"> • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • OEE • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise, the work organisation, culture • regulatory environment and the industry sector
TPM	TPM is an application of total quality management to maintenance with the intention of increasing reliability, getting it right first time and increasing OEE
RCM	RCM moves maintenance from reactive, or even planned/programmed, towards a focus on uptime and OEE
Similar strategies	<p>Similar strategies may include:</p> <ul style="list-style-type: none"> • mean time between failure (MTBF) which is one key measure of the effectiveness of a maintenance procedure, and is an indicator as to whether root causes are being found and resolved. If MTBF is reducing, then it is an indicator that the maintenance regime is failing • failure mode and effects analysis (FMEA) which is a systematic approach that identifies potential failure modes in a system, product, or equipment based operations caused by either design or operation/process deficiencies. It also identifies critical or significant design or process characteristics that require special controls to prevent or detect failure modes. FMEA is a tool used to prevent problems from occurring • industry sectors have highly adapted forms of FMEA

	<p>and which may practice traditional FMEA in say their routine maintenance while using another technique, such as Hazard and Operability Studies (HAZOP) for design and modification. HAZOP is a form of FMEA which has been practiced by the process industries for over 30 years and examines the implications of changes in process conditions to process stability</p> <ul style="list-style-type: none"> condition monitoring which often involves quite sophisticated monitoring of equipment, including such things as vibration monitoring, instrumental analysis of lubricating oil, and so on, to determine the current state of the equipment, monitor the change in this condition and predict when it needs servicing/maintenance to maintain reliability.
OEE	<p>OEE is the combination of the main factors causing loss of productive capacity from equipment/plant and is:</p> $OEE = \text{availability} \times \text{performance} \times \text{quality rate}$ <p>where:</p> <ul style="list-style-type: none"> availability takes into account losses due to breakdown, set-up and adjustments performance takes into account losses due to minor stoppages, reduced speed and idling quality rate takes into account the losses due to rejects, reworks and start-up waste
Uptime	<p>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%</p>
Inspection	<p>Inspection may include:</p> <ul style="list-style-type: none"> reading dials, gauges and meters observations, including those using sight, hearing, smell and feel observations of product quality/faults/rejects
Servicing	<p>Servicing may include:</p> <ul style="list-style-type: none"> cleaning lubricating topping up adjusting
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> work instructions standard operating procedures

	<ul style="list-style-type: none">• formulas/recipes• batch sheets• temporary instructions and similar instructions provided for the smooth running of the plant• good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care)• government regulations <p>Procedures may be:</p> <ul style="list-style-type: none">• written, verbal, computer based or in some other format
--	---

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405010A Manage relationships with non-customer external organisations

Modification History

New unit, superseding MSACMS606A Manage relationships with non-customer external organisations - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to identify and manage relationships with non-customer external organisations, such as community groups, other businesses, training providers, research organisations and government departments.

Application of the Unit

This unit applies to a person who has policy responsibility in an organisation for managing external relationships that may impact on the performance, community standing or regulatory compliance of the organisation. Examples of the application of this unit include department leaders, managers or similar. The unit covers managing a range of external organisations to the maximum benefit of the organisation and the organisation's customers while also identifying areas of mutual interest and benefit with the external organisations. Relationships may or may not be initiated by the person's own organisation.

This unit does not cover the analysis and improvement of relationships between members of a value stream, such as suppliers and customers.

This unit primarily requires the application of skills associated with communication in gathering, analysing and applying information and consulting with stakeholders. Problem solving, initiative and enterprise, and planning and organising are also required. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into relationship systems and expectations.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Identify mutual interest	1.1	Clarify the reason contact was/is to be made for each relevant external organisation
		1.2	Gather information on extent of past contact and any positive or negative outcomes for own and external organisation
		1.3	Identify expectations of initiating organisation
		1.4	Analyse the breadth, depth and complexity of external organisations' expectations
		1.5	Discuss expectations, ability to meet those expectations, and areas of mutual interest with relevant internal and external representatives
2	Determine contribution of relationship	2.1	Identify any value contributions from relationship
		2.2	Identify waste arising from relationship
		2.3	Classify waste as necessary or unnecessary
		2.4	Set key performance indicators (KPIs) for future relationship
3	Manage the	3.1	Measure current performance of relationship against

relationship	expectations and KPIs
3.2	Develop systems to enhance mutual benefit and value contributions from relationship
3.3	Develop systems to minimise and control necessary waste without causing harm
3.4	Eliminate unnecessary waste, where possible, without causing harm
3.5	Monitor KPIs and determine future strategy for the relationship
3.6	Continue to manage terminate the relationship in a manner which enhances the organisation

Required Skills and Knowledge

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

Required skills

Required skills include:

- using formal problem solving procedures, such as root cause analysis (RCA)
- analysing contributions to value from external relationships
- identifying waste (muda)
- developing formal and informal communication procedures with other individuals and organisations
- establishing sources of assistance in own organisation for external individuals and organisations
- interpreting documents, procedures and instructions for others
- establishing KPIs for relationships

Required knowledge

Required knowledge includes:

- strategic requirements of own organisation
- strategic benefits to the organisation from liaisons with external organisations
- possible external organisations which may offer benefits
- benefits which can be offered to the external organisations
- customer benefits/features from products and processes of own organisation

- waste (muda) elimination
- formal problem solving procedures (e.g. RCA)

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • analyse the value and waste in relationships • implement changes to relationships to improve outcomes for their organisation and its customers • monitor outcomes of a relationship against KPIs • communicate complex information to external representatives using a variety of methods and mediums.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace that is engaging with one or more non-customer external organisations.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • historical information on the relationship with external organisation and the involvement of the assessee • workplace procedures and plans • specifications and documentation relating to planned, currently being implemented, or implemented changes to relationships with non-customer external organisations • reports from supervisors/managers on interaction with external non-customer organisations • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation

	<ul style="list-style-type: none"> • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and
--	--

	<p>analysis</p> <ul style="list-style-type: none"> • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Reasons for contact	<p>Reasons for contact may include:</p> <ul style="list-style-type: none"> • research • innovation • mutual cooperation • strategic alliances • computer (or other) technology • emergency response
Waste	<p>Waste (also known as muda in the Toyota Production System and its derivatives) is any activity which does not contribute to customer benefit/features in the product. Categories of waste include:</p> <ul style="list-style-type: none"> • excess production and early production • delays • movement and transport • poor process design • inventory • inefficient performance of a process • making defective items • activities which do not yield any benefit to the organisation or any benefit to the organisation's customers

Necessary waste	<p>Necessary waste includes:</p> <ul style="list-style-type: none">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) <p>Necessary waste cannot be eliminated but should be managed</p>
Unnecessary waste	<p>Unnecessary waste includes:</p> <ul style="list-style-type: none">any activity or cost which does not contribute directly to customer benefit/features in the product and can be avoided <p>Unnecessary waste should be eliminated as quickly as practical</p>

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405011A Manage people relationships

Modification History

New unit, superseding MSACMC611A Manage people relationships - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to manage the human relationship aspects of implementing and operating competitive systems and practices.

Application of the Unit

This unit applies to a person (who may be a manager, technical specialist or other person) who is required to work with employees and relevant people, encourage them to accept change and also to increase the quality, quantity and reliability of output consistent with customer requirements.

This unit primarily requires strong communication, teamwork and problem solving skills to achieve effective relationships that support a competitive systems and practices environment. Initiative, enterprise, planning and organising are also required to ensure relationships are monitored and issues are resolved proactively. The unit also includes aspects of self-management and learning to ensure improvement of own performance and communication skills.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a

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

unit of competency. text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Confirm organisation competitive systems and practices status	1.1	Establish number and status of competitive systems and practices techniques being used within the organisation
		1.2	Identify key performance indicators (KPIs) for each technique
		1.3	Identify key sections and value stream members responsible for each KPI
		1.4	Identify key personnel for communications
2	Develop an open environment	2.1	Establish and maintain regular dialogue between all levels and all relevant sections of the organisation
		2.2	Encourage a flow of communications in both directions
		2.3	Develop and maintain a formal mechanism for the flow of issues, concerns and suggestions in both directions
		2.4	Develop and maintain regular and frequent communication with all key stakeholders
3	Identify significant issues	3.1	In liaison with relevant team members/stakeholders, identify current and potential issues
		3.2	Assist team members/stakeholders to formulate issues
		3.3	Identify and define boundary and non-negotiable issues for all team members/stakeholders
		3.4	Negotiate with relevant team members/stakeholders over actual and potential issues

4	Proactively resolve issues	4.1	Liaise with team members/stakeholders to develop agreed, and where possible, win-win solutions
		4.2	Negotiate acceptable solutions, as required, in accordance with company practices/procedures
		4.3	Obtain any required official authorisations
		4.4	Consult with relevant stakeholders to develop implementation plan
		4.5	Implement solution
5	Monitor ongoing situation	5.1	Determine relevant KPIs for plan
		5.2	Check that implementation is proceeding to plan
		5.3	Check for unforeseen consequences
		5.4	Take appropriate action to resolve any arising issues

Required Skills and Knowledge

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

Required skills

Required skills include:

- analysing the competitive operational techniques being implemented in the organisation and the stage of implementation, including identifying people, related needs and issues
- using formal problem solving procedures, such as root cause analysis (RCA)
- analysing work procedures
- developing formal and informal communication procedures with others in work area, team leaders and other employees relevant to competitive systems and practices changes
- establishing sources of assistance in the organisation for people experiencing difficulty with competitive systems and practices changes
- interpreting procedures and instructions relevant to own expertise for others
- establishing KPIs for own work

Required knowledge

Required knowledge includes:

- features and benefits of common competitive operational practices, including:
 - Just in Time (JIT) and kanban systems
 - preventative maintenance
 - 5S housekeeping
 - continuous improvement processes (kaizen)
 - waste (muda) elimination
 - formal problem solving procedures (e.g. RCA)
 - standardised work
- health, safety and environment (HSE) principles and requirements for organisation
- change implementation contacts and procedures for the organisation
- employee assistance mechanisms in the organisation
- current processes and principles of operation sufficient to enable communication with others on the impact of competitive operational changes
- sources of data on the process/plant and possible applications to information distribution
- methods of determining own skill needs and developing skills, if required

Evidence Guide

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

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

A person who demonstrates competency in this unit must be able to provide evidence of the ability to:

- identify the processes used and scope of products/ services supplied by the organisation and the deliverables expected by customers
- relate processes and products/services to the competitive systems and practices implementation process and the stage of implementation
- communicate and gain support for changes made as a result of the implementation of the competitive systems and practices implementation
- develop formal and informal channels of communication, including feedback mechanisms
- proactively resolve issues and problems raised by people with the competitive systems and practices implementation process.

Context of and specific resources

Assessment of performance must be undertaken in a

for assessment	<p>workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Key personnel	<p>Key personnel for communication include:</p>

	<ul style="list-style-type: none">formally identified managers, supervisors and workforce delegates as well as key opinion shapers (e.g. employees with specialist technical knowledge) on the issue being communicated
Formal mechanisms	<p>Formal mechanisms for communication will vary according to the organisation but may include:</p> <ul style="list-style-type: none">noticeboardsemployee circularsconsultative committeesstaff associationsunion representativesteam leaders
Stakeholders	<p>Stakeholders may include:</p> <ul style="list-style-type: none">team memberspersonnel officersindustrial officersunion delegatesproduction managementhuman relations managementfinancial managementengineering/technical personnel

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405012A Manage workplace learning

Modification History

New unit, superseding MSACMC612A Manage workplace learning - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to manage the learning and skill development for employees within an organisation implementing competitive systems and practices.

Application of the Unit

This unit applies to a person responsible for management of the identification of skills needed by employees to undertake required work in implementing competitive systems and practices, including arranging for any required learning processes. The unit does not cover trainer and assessor skills.

This unit primarily requires the application of skills associated with communication, teamwork, problem solving, initiative and enterprise in order to assess and address skill needs in an individual and in the organisation. Planning and organising is required to ensure skill development meets the needs of the organisation and aspects of self-management and learning are required to ensure improvement of performance.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a

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

unit of competency. text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1	Determine current skill requirements for employees	1.1	Establish range and stage of implementation of competitive systems and practices techniques in the organisation
		1.2	Consult with relevant stakeholders on skill requirements for effective implementation of competitive systems and practices techniques used in the organisation
		1.3	Ensure records/database of skill mix currently required by employees are maintained in accordance with procedures
		1.4	Re-assess and monitor the skills required by employees as organisation requirements change
		1.5	Consult with relevant stakeholders to predict any new/different skill requirements arising from changes to products, processes, equipment or work organisation
2	Determine current skill mix of employees	2.1	Ensure current records/database of skill profile of individuals are maintained
		2.2	Consult with relevant stakeholders and monitor the application of these skills in the workplace to ensure they remain current and valid
		2.3	Review the actual skill mix of employees compared to the required skill mix
3	Make arrangements for skill development	3.1	Consult with employees and identify any mismatch of skills possessed and used and skills required
		3.2	Identify any new skills required due to anticipated changes

- | | | | |
|---|--------------------------------------|-----|--|
| | | 3.3 | Consult with relevant stakeholders to determine the best way to refresh existing skills/develop new skills |
| | | 3.4 | Develop individual skill development program |
| | | 3.5 | Ensure skill development arrangements are implemented in accordance with procedures |
| 4 | Forecast possible future skill needs | 4.1 | Examine strategic directions of organisation |
| | | 4.2 | Discuss possible future directions with relevant stakeholders |
| | | 4.3 | Determine possible long-term future skill requirements in consultation with relevant stakeholders |
| | | 4.4 | Develop plan to ensure skills are developed in advance of when they are required |

Required Skills and Knowledge

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

Required skills

Required skills include:

- analysing the competitive operational techniques being implemented in the organisation and the stage of implementation, including establishing skill needs to support implementation
- using formal problem solving procedures, such as root cause analysis (RCA)
- analysing work procedures
- developing formal and informal communication procedures with others in work area, team leaders and other employees relevant to competitive systems and practices changes
- establishing sources of assistance in the organisation for people experiencing difficulty with competitive systems and practices changes
- interpreting procedures and instructions relevant to own expertise for others
- establishing key performance indicators (KPIs) for own work

Required knowledge

Required knowledge includes:

- features and benefits of common competitive operational practices, including:
 - Just in Time (JIT) and kanban systems
 - preventative maintenance
 - 5S housekeeping
 - continuous improvement processes (kaizen)
 - waste (muda) elimination
 - formal problem solving procedures (e.g. RCA)
 - standardised work
- skill analysis methods or how to access skill analysis from relevant experts
- skill development methods or how to access skill development programs from relevant experts
- electronic and other systems to record and maintain training and skills records
- formal qualifications and skill standards relevant to competitive systems and practices and the processes and products of the organisation
- current processes and principles of operation sufficient to enable communication with others on the impact of competitive operational changes
- sources of data on the processes and/or products of the organisation and implications for workplace learning
- methods of determining own skill needs and developing skills, if required

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • identify the processes used and scope of products/ services supplied by the organisation and the deliverables expected by customers • relate processes and products/services to the competitive systems and practices implementation process and the stage of implementation • establish skill needs from processes/products and competitive implementation process in the organisation • use formal and informal channels of communication, including feedback mechanisms to assist in identification of skill needs • manage delivery and recording of training to ensure
---	--

	required skills are gained by employees.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to past and current skill development for employees • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Stakeholders	<p>Stakeholders may include:</p>

	<ul style="list-style-type: none"> • team members • personnel officers • industrial officers • union delegates • production management • human relations management • financial management • engineering/technical personnel
Skill development arrangements	<p>Skill development arrangements include:</p> <ul style="list-style-type: none"> • formal vocational and education delivery by a registered training provider (RTO) • education and training delivery by a higher education provider • non-accredited on and off the job training by the organisation, equipment suppliers, industry associations, and so on • coaching and mentoring • self-directed learning • arrangements for recording skills gained by employees
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the processes in an organisation • good operating practice as may be defined by industry codes of practice (e.g. Good manufacturing practice (GMP) and responsible care) • government regulations • industrial relations requirements and any classification changes that result from the acquisition of higher level skills <p>Procedures may be:</p> <ul style="list-style-type: none"> • written, verbal, computer-based or in some other format

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405040A Manage 5S system in an organisation

Modification History

New unit, superseding MSACMT640A Manage 5S system in a manufacturing environment - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required for the overall management of the 5S system in an organisation.

Application of the Unit

This unit applies to an individual who is responsible for ensuring the smooth operation and continuous improvement of the 5S system in an organisation. This may be for an initial introduction of, or for the ongoing implementation and continuous improvement resulting from, 5S.

This unit requires the application of skills associated with problem solving, planning, communication and teamwork.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Organise an appropriate environment for 5S	1.1	Ensure managers and other key stakeholders support and understand 5S
		1.2	Arrange for team leaders to develop/maintain skills required for 5S
		1.3	Ensure team leaders are developing/maintaining skills required in their team members
		1.4	Ensure procedures and work practices reflect 5S needs and regulatory requirements
		1.5	Practise 5S in own work
		1.6	Eliminate roadblocks to 5S
2	Audit 5S implementation	2.1	Undertake spot checks of compliance
		2.2	Review workplace and records for indicators of compliance/non-compliance
		2.3	Encourage all levels of the workforce to routinely suggest areas for improvement
		2.4	Discuss 5S routinely with team leaders to seek ideas for implementation of improvement suggestions and encourage identification of non-conformance
3	Improve 5S	3.1	Negotiate solutions to non-conformances
		3.2	Implement agreed solutions
		3.3	Work with team leaders to develop opportunities for improvements
		3.4	Provide necessary resources for improvements
		3.5	Ensure procedures and practices change to reflect

improvements

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with stakeholders on aims and objectives of 5S program in the organisation
- mentoring and monitoring team leaders in their skills and knowledge of 5S and the organisations objectives for 5S
- conducting formal and informal meetings and explaining 5S and related concepts
- reviewing regulatory requirements for implications for 5S implementation
- facilitating team goals, activities and communications and accessing resources
- problem solving 5S poor performance and problems to root cause
- identifying requirements and negotiating resources for 5S implementation across the organisation
- planning and prioritising activities of teams
- identifying problems in 5S implementation caused by gaps in skills and/or knowledge and developing options to address them

Required knowledge

Required knowledge includes:

- organisation operations and structure
- principles of efficient workplace organisation
- purposes and methodology of 5S
- operation procedures relevant to jobs in the organisation
- relevant regulatory requirements
- processes for identification of skill gaps
- methods of addressing skill gaps
- ways of encouraging team leaders and operators to find and suggest areas for improvement
- methods of making/recommending improvements
- methods of accessing required resources
- non-conformance, what they are, assessment of severity and action to be taken

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • encourage and monitor a systematic approach to implementing 5S • analyse areas and records for evidence of 5S conformance/non-conformances • manage non-conformances in implementation of 5S • lead and motivate others in achieving 5S outcomes and making improvements to the 5S systems.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads, hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence.

	<p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE)
--	---

	<ul style="list-style-type: none"> • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> • work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) • government regulations <p>Procedures may be:</p> <ul style="list-style-type: none"> • written, verbal, computer-based or in some other format
Roadblocks	<p>Roadblocks include:</p> <ul style="list-style-type: none"> • all factors which are inhibiting the smooth implementation of 5S
5S	<p>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:</p> <ul style="list-style-type: none"> • sort • set in order • shine • standardise • sustain
Sort	<p>Sort involves keeping only what is absolutely necessary</p>

	<p>for the processes in the work area. Sort includes:</p> <ul style="list-style-type: none"> clearing the work area of all non-essential equipment and materials <p>Non-essential items include:</p> <ul style="list-style-type: none"> those not required to either produce product, conduct process or operations or make required adjustments to equipment during process or operations
Set in order	<p>Set in order includes:</p> <ul style="list-style-type: none"> assigning required equipment and materials appropriate locations in the work area (locations should be clearly marked and labelled to show the item and proper location)
Shine	<p>Shine includes:</p> <ul style="list-style-type: none"> keeping the work area clean at all times. This should be carried out to a regular daily schedule against allowed time and, on most occasions, at the end of a job
Standardise	<p>Standardising includes:</p> <ul style="list-style-type: none"> activities that help maintain the order and the housekeeping standards using procedures and checklists developed from a procedure
Sustain	<p>Sustain includes:</p> <ul style="list-style-type: none"> making sure that daily activities are completed every day regardless of circumstance undertaking inspections, including: <ul style="list-style-type: none"> informal inspections carried out often, at least weekly formal inspections carried out at least monthly <p>Specific actions should be followed up to generate continuous improvement</p>
Items in work area	<p>Items in work area may include:</p> <ul style="list-style-type: none"> tools jigs/fixtures materials/components plant and equipment manuals personal items (e.g., lunch boxes and posters) safety equipment and personal protective equipment

	<ul style="list-style-type: none">• other items which happens to be in the work area
--	--

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405041A Implement improvement systems in an organisation

Modification History

New unit, superseding MSACMT641A Implement a continuous improvement system - Not equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to introduce and institutionalise continuous improvement and breakthrough improvement processes in an organisation.

Application of the Unit

This unit applies to an individual responsible for the introduction of improvement systems across an organisation. The systems will include a continuous improvement system sometimes also known as kaizen, and breakthrough improvement sometimes known as kaizen blitz.

The continuous improvement (kaizen) system consists of strategies for continuously monitoring for and implementation of incremental improvements to processes, operations and products. Breakthrough improvement 'events' (kaizen blitz) covers the identification of improvement opportunities that are best undertaken in a single exercise.

This unit primarily requires the application of skills associated with teamwork, problem solving, initiative and enterprise, and planning and organising skills in order to identify, implement and institutionalise kaizen activity. Communication skills are required to gather information and consult with team members and other stakeholders. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into continual improvement.

Depending on the starting point for the continuous improvement program in the enterprise other relevant units may need to be selected, including:

- *MSS402080A Undertake root cause analysis*
- *MSS405011A Manage people relationships*
- *MSS405040A Manage 5S system in an organisation*
- *MSAPMSUP390A Use structured problem solving tools.*
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Prepare for improvement systems implementation	1.1	Determine scope of improvement systems
		1.2	Identify key performance indicators (KPIs) for inclusion in improvement systems
		1.3	Prepare operating instructions and other required documentation for continuous and breakthrough improvement systems
		1.4	Ensure compliance with health, safety and environment (HSE) and other regulatory requirements are addressed in improvement instructions
		1.5	Identify and brief implementation team
		1.6	Prioritise areas operation, or processes requiring early action
		1.7	Prepare communication strategy for employees and other stakeholders
		1.8	Make infrastructure and support arrangements for improvement systems

- | | | | |
|---|---|-----|---|
| | | 1.9 | Obtain required approvals for commencement of improvement systems |
| 2 | Implement improvement systems | 2.1 | Arrange for initial training in continuous improvement (kaizen) and related competitive systems and practices for employees |
| | | 2.2 | Facilitate the development of operating protocols for continuous improvement at the team level |
| | | 2.3 | Establish decision making mechanism for system level continuous improvement |
| | | 2.4 | Invite suggestions for breakthrough improvements |
| | | 2.5 | Establish mechanism for prioritising breakthrough improvements |
| | | 2.6 | Establish breakthrough teams and implement priority breakthrough events |
| | | 2.7 | Clarify points of disagreement/uncertainty over improvement systems implementation through consultation and, where required, by reference to procedures or other relevant authority |
| 3 | Monitor implementation of improvement systems | 3.1 | Consult stakeholders on processes and perceived success of early implementation of continuous and breakthrough improvement events |
| | | 3.2 | Analyse processes and operations to quantify variations in KPIs over early period of implementation of improvement systems |
| | | 3.3 | Identify and solve ongoing performance issues |
| | | 3.4 | Negotiate any differences between problems and proposed solutions |
| | | 3.5 | Develop plans and obtain agreements to implement further improvements |
| | | 3.6 | Implement improvements |
| | | 3.7 | Measure changes and calculate benefits |

- | | | | |
|---|---|-----|--|
| | | 3.8 | Complete all relevant documentation |
| | | 3.9 | Communicate achievements to stakeholders |
| 4 | Institutionalise continuous improvement | 4.1 | Arrange for regular reviews of improvement systems |
| | | 4.2 | Integrate improvement system reports with other reporting processes, including visual management systems |
| | | 4.3 | Arrange for regular reporting of improvement system results to customers and other critical stakeholders |

Required Skills and Knowledge

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

Required skills

Required skills include:

- implementing continuous and breakthrough improvement in a variety of contexts, including a mixture of supportive and non-supportive team environments
- undertaking self-directed problem solving and decision-making
- communicating across all levels in the organisation and to people of different levels of literacy
- analysing customer features/benefits, organisation goals and past performance and setting KPIs for inclusion in a continuous improvement system
- prioritising improvement suggestions in terms of:
 - the extent to which they add to customer features/benefits
 - feasibility
 - cost
- preparing operating procedures and other documentation, including establishing version control and amendment procedures
- analysing information and data to identify variation and evaluate improvements
- measuring and calculating performance variables
- solving problems to root cause
- identifying waste (muda)

Required knowledge

Required knowledge includes:

- continuous and breakthrough improvement (kaizen and kaizen blitz) philosophy and process
- competitive systems and practices, including:
 - value stream mapping
 - 5S
 - Just in Time (JIT)
 - mistake proofing
 - process mapping
 - establishing customer pull
 - setting of key performance indicators/metrics
- types of KPIs and their impacts on performance
- improvement processes, including implementation, monitoring and evaluation strategies

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • interpret operations, processes and products in terms of customer features/benefits and then set appropriate KPIs • prepare appropriate documentation for continuous and breakthrough improvement processes • establish decision making processes for considering system level continuous improvement suggestions • encourage and lead others in implementing continuous improvement system • problem solve implementation issues with continuous improvement system • lead and motivate others in planning, implementing and sustaining improvements.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area

	<ul style="list-style-type: none"> • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of

the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Scope of improvement systems	<p>The scope of the improvement systems includes:</p> <ul style="list-style-type: none"> • target divisions, operations, work processes, products and sites that stakeholders want included in a particular improvement system • goals and objectives of the organisation: <ul style="list-style-type: none"> • levels of targeting for the continuous improvement system, including the system level

	<p>focusing on the value stream and the overall achievement of customer defined features/benefits</p> <ul style="list-style-type: none"> process level focusing on individual processes, teams and team leaders
Relevance of KPIs	<p>Relevance of KPIs includes:</p> <ul style="list-style-type: none"> appropriateness (did they lead to/encourage desirable performance?) currency (are they still encouraging desirable performance?) unintended consequences (do they lead to outcomes which are not desirable – even if some performance is desirable?) signal/noise (is the balance between desirable and undesirable outcomes strong and positive?)
Instructions for incremental or breakthrough improvement processes	<p>Instructions for incremental or breakthrough improvement process include:</p> <ul style="list-style-type: none"> methods for employees to suggest incremental or breakthrough improvement criteria for identifying a breakthrough improvement need approval processes monitoring and reporting processes
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> work instructions standard operating procedures formulas/ recipes batch sheets temporary instructions and similar instructions provided for the smooth running of the plant, process or operation good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) government regulations required procedures under legislation or regulation, awards and enterprise agreements <p>Procedures may be:</p> <ul style="list-style-type: none"> written, verbal, computer based or in some other format
Waste	<p>Waste (also known as muda in the Toyota Production System and its derivatives) is any activity which does not</p>

	<p>contribute to customer benefit/features in the product or process. Categories of waste include:</p> <ul style="list-style-type: none">• excess production and early production• delays• movement and transport• poor process design• inventory• inefficient performance of a process• making defective items• activities which do not yield any benefit to the organisation or any benefit to the organisations customers
Solve performance issues	<p>Solving performance issues includes:</p> <ul style="list-style-type: none">• generating improvement ideas (brainstorming/asking experts)• selecting most appropriate improvement ideas to proceed with• conducting experiments where required to test idea• making final selection of improvement ideas• determining most appropriate improvement strategy (i.e. incremental or breakthrough (kaizen blitz) improvement)

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405050A Determine and improve process capability

Modification History

New unit, superseding MSACMT650A Determine and improve process capability* - Equivalent

* New prerequisite *MSS404052A Apply statistics to operational processes* superseding MSACMT452A Apply statistics to processes in manufacturing

Unit Descriptor

This unit of competency covers the skills and knowledge required to determine the actual (as distinct from design) capability of a process and then to analyse that process to remove assignable causes and reduce random causes. This would typically be done by a manager or technical expert support person either working in a team, or in close liaison with key stakeholders. Process capability is typically calculated using standard deviations.

Application of the Unit

This unit applies to an individual (who may be a production manager, plant/process engineer, technical specialist or similar) who is responsible for developing plans to stabilise and then improve process capability and following agreement the implementation of the plans to improve process capability. The organisation may use either a six sigma or three sigma process.

This unit primarily requires the application of skills associated with communication in gathering and analysing data and consulting with relevant personnel. Teamwork, problem solving, initiative and enterprise, and planning and organising are required to determine causes to variations and implement solutions. This is done in an environment using computer technology and also requires aspects of self-management and learning to ensure feedback and new learning is integrated into process improvements and operations management control systems.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MSS404052A Apply statistics to operational processes

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Obtain data for process capability study	1.1	Identify the process requiring capability analysis including relevant procedures
		1.2	Identify customer specifications for product or service
		1.3	Obtain process capability data
2	Analyse data	2.1	Identify assignable causes of variation in liaison with relevant personnel
		2.2	Develop solutions to eliminate variation due to assignable causes in liaison with relevant personnel
		2.3	Analyse random variations for possible causes in liaison with relevant personnel
		2.4	Confirm causes of random variation
		2.5	Develop solutions to reduce random variations in liaison with relevant personnel
3	Take action to improve process	3.1	Develop plans to implement solutions
		3.2	Liaise with relevant personnel to implement solutions

capability	3.3	Gain necessary approvals, as required
	3.4	Monitor implementation and make adjustments, as required
	3.5	Determine new/revised process capability
	3.6	Implement revised process capability regime

Required Skills and Knowledge

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

Required skills

Required skills include:

- using a variety of statistical methods and calculations
- communicating and negotiating at all levels in the organisation and value stream and with individuals of different levels of literacy and numeracy
- negotiating with employees, suppliers and customers, where necessary, to achieve access to, or collection of, data
- planning process and data collection changes required for process improvement, including:
 - objectives
 - performance indicators to be monitored to indicate success of change
 - resources required
 - training required
 - communication and liaison required with employees, suppliers and customers
 - implementation period required
- analysing variations and categorising into assignable and random cause
- undertaking self-directed problem solving and decision-making on issues of a broad and/or highly specialised nature and in a wide variety of contexts
- working in and leading teams for data collection and process improvement
- using software computers and terminals, as required, to collect and analyse data

Required knowledge

Required knowledge includes:

- data collection methods
- data processing techniques required to establish variability and normal distribution
- calculate three sigma or six sigma processes, as relevant

- random and non-random results and processes for recognition of assignable causes
- causes of different types of non-random results
- causes of random variation
- process understanding sufficient to translate the data into variations in the process and determine methods of controlling them

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of their ability to:</p> <ul style="list-style-type: none"> • collect or obtain data relevant process capability data from a variety of sources data • work with people and analyse data to determine assignable causes • plan and prepare improvement proposals • monitor implementation of improvement proposals.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects

	<ul style="list-style-type: none"> • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems
--	--

	<ul style="list-style-type: none"> • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Six sigma	<p>Six sigma refers to:</p> <ul style="list-style-type: none"> • 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 <p>Six sigma is also used as a general term covering a competitive systems and practices approach. Six sigma training typically covers several units of competency in this Training Package</p>
Three sigma	<p>Three sigma refers to:</p> <ul style="list-style-type: none"> • a traditional statistical process control uses three sigma limits which equates to 3 defects per thousand opportunities for each product or service transaction
Process capability data	<p>Process capability data includes:</p> <ul style="list-style-type: none"> • customer requirements for product or service • process stability (control chart) performance • other charts and data
Procedures	<p>Procedures may include:</p> <ul style="list-style-type: none"> • work instructions • standard operating procedures

	<ul style="list-style-type: none">• formulas/recipes• batch sheets• temporary instructions and similar instructions provided for the smooth running of the plant• good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care)• government regulations <p>Procedures may be:</p> <ul style="list-style-type: none">• written, verbal, computer-based or in some other format
--	---

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405060A Develop the application of enterprise control systems in an organisation

Modification History

New unit, superseding MSACMT660A Develop the application of enterprise systems in manufacturing - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to continuously modify and improve or develop new enterprise-wide information technology (IT) based control systems, such as Supervisory Control and Data Acquisition (SCADA), Enterprise Resource Planning (ERP), Materials Resource Planning (MRPII) and similar. Typically the development of such a system will be in liaison with an appropriate technical expert who may be an internal expert or an external consultant.

Application of the Unit

This unit applies to an individual responsible for the development and implementation of new systems or modifications/changes to the current system. While the individual might generate the ideas for change themselves and also undertake a significant part of the final implementation, they may also be working closely with an appropriate technical expert (such as the software system supplier) who may actually make the modifications.

This unit primarily requires the application of skills associated with communication in gathering, analysing and applying information and consulting with stakeholders. Teamwork, problem solving, initiative and enterprise, and planning and organising skills are required to determine and implement effective enterprise systems and modifications. This unit also requires computer skills and aspects of self-management and learning to ensure feedback and new learning is integrated into system planning.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Monitor information and control needs of organisation	1.1	Check the use of current information
		1.2	Check the operation of current control systems
		1.3	Communicate regularly with key information users regarding any new or changed information control needs, including information needs from and to value stream
		1.4	Identify short comings in information and control provision
		1.5	Take appropriate action on information and control needs to meet organisational needs
2	Check the current system against organisation needs	2.1	Check the routine use of the system
		2.2	Check any system alarm or non-conformance notification and control operation
		2.3	Communicate regularly with key stakeholders about current system use and application
		2.4	Determine effect of non-conformance on enterprise system

		2.5	Identify problems/issues
		2.6	Take appropriate action on problems and issues
3	Determine developments needed in a new or significantly modified system	3.1	Identify needs requiring a new system or development of modifications to the current system
		3.2	Draft scope, specifications and outcomes required
		3.3	Liaise with key stakeholders and relevant technical experts to refine scope, specifications and outcomes needed in new or modified system
		3.4	Agree final scope, specifications and outcomes
4	Develop system	4.1	Develop project plan
		4.2	Ensure ongoing consultation with all relevant stakeholders
		4.3	Manage development project
		4.4	Manage trialling of modified system
		4.5	Ensure modified system meets organisational requirements
5	Implement modified system	5.1	Liaise with all affected personnel
		5.2	Develop and agree an implementation strategy
		5.3	Ensure all personnel have required skills
		5.4	Implement modified system
		5.5	Monitor implementation and modify, as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- identifying organisation needs from enterprise control system, including:
 - critical features (e.g. occupational health and safety (OHS), regulatory compliance and emergency shutdown)
 - essential features and operation controls
 - access levels and access security
 - cost of installation and operation
 - interfaces (e.g. human-machine, machine-machine, and system-system, e.g. SCADA with financial control systems)
- correctly accessing and inputting information
- communicating with stakeholders on information and control requirements
- matching monitoring, control and reporting capability of system to organisation requirements
- analysing features of enterprise system and determining training needs
- solving problems to root cause
- monitoring trials and initial implementation of enterprise control system

Required knowledge

Required knowledge includes:

- capability of resource planning/SCADA systems, as appropriate
- information and control needs of organisation/process
- project management
- support/training/skill development mechanisms available for access by personnel

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of their ability to:</p> <ul style="list-style-type: none">• analyse organisation needs and match to enterprise control system features• determine critical features required in enterprise control system• modify system as a result of trials or changing needs.
---	--

<p>Context of and specific resources for assessment</p>	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
<p>Method of assessment</p>	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
<p>Guidance information for assessment</p>	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as SCADA software, ERP systems, MRP and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
SCADA	<p>SCADA refers to:</p> <ul style="list-style-type: none"> • a number of systems which automatically collect critical process data, perform required mathematical

	<p>manipulations on it and then make control decisions and/or give required information personnel for action</p> <p>In the continuous operations sector, the SCADA system is sometimes integrated into other sophisticated computer control systems, such as distributed control system (DCS) and indeed these systems do merge in advanced systems. These organisations may simply refer to their SCADA as the DCS or other similar term (such as the proprietary name of the computer system)</p>
Resource planning	<p>Planning software is a general term applied to a number of software systems which integrate a range of business information, such as:</p> <ul style="list-style-type: none"> • finance • logistics maintenance and production <p>It is frequently referred to by names, such as ERP and MRP/MRP II</p>
Value stream	<p>The value stream begins with the customer and includes all actions (both value adding and non value added) by both internal sections/departments and external organisations to meet a customer requirement.</p> <p>Depending on the operations and the customer requirement stages where value stream actions may occur include:</p> <ul style="list-style-type: none"> • sales outlet/representative • information gathering, data analysis and research • product design • raw material sourcing • intermediate processing • final assembler/collation/preparation • support services (e.g. accounting, finance and legal) • storage and delivery to customer • after market support

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405061A Determine and establish information collection requirements and processes

Modification History

New unit, superseding MSACMT661A Determine and establish information collection requirements and processes - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to determine what information is needed to support decision-making in a competitive systems and practices environment and then to set about establishing required information collection systems. This would usually be done as part of a team and would require consultation with all key stakeholders.

Application of the Unit

This unit covers the determination of data needs and collection methods for an organisation or specific plant or process. This will typically be done in liaison with a wide range of people, each of whom will have their own specific information requirements. There will need to be balanced and interpreted into a workable set of data to be collected.

This unit is primarily focused on those decisions which are non-routine and so need specific collection of data, or for those decisions which are routine, the establishment of a routine data collection protocol to allow for the decisions to be made based on appropriate, reliable data.

This unit primarily requires the application of communication and problem solving skills associated with determining information requirements and processes of information collection. Initiative and enterprise, and planning and organising are also required to ensure information targets specific factors. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into the development of processes.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Analyse decisions to be made	1.1	Identify personnel to be included in the analysis process
		1.2	Determine the consequences of the decisions in liaison with relevant personnel
		1.3	Determine the variables which can be controlled
		1.4	Determine the variables which cannot be controlled
		1.5	Determine the consequences of a change in these variables in liaison with affected personnel
2	Define factors which cause variables to change	2.1	Identify factors which are able to be controlled
		2.2	Identify factors which are not able to be controlled
		2.3	Identify means of measuring these factors, or indicators for the values of these factors
		2.4	Compile a list of measurements/indicators required.
		2.5	Communicate with team members and involve them in development of factors and changes to ensure awareness and facilitate learning

3	Develop data collection protocols	3.1	Determine methods of making measurements
		3.2	Determine methods of quantifying indicators
		3.3	Determine the benefit/cost of automated (or other) collection of data
4	Develop systems to produce required information	4.1	Identify user of information and their needs and abilities
		4.2	Determine data processing needs to produce required information
		4.3	Determine information distribution channels
		4.4	Determine skill development need for recipients of information
		4.5	Implement systems to produce information
		4.6	Monitor implementation and make adjustments, as required

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating and negotiating at all levels in the organisation and value stream and with individuals of different levels of literacy and numeracy
- negotiating with employees, suppliers and customers, where necessary, to achieve access to, or collection of, data
- undertaking self-directed problem solving and decision-making on issues of a broad and/or highly specialised nature and in a wide variety of contexts
- developing or sourcing indicators for factors not easily measured
- liaising with stakeholders on acceptable limits for benefits and costs in data collection procedures

Required knowledge

Required knowledge includes:

- business needs of the organisation/section
- information needs of individuals within the organisation
- possible data available/potentially available to the organisation
- methods of collecting available data
- relationship between data available and information required
- methods of converting data into useful information
- methods of developing indicators for factors resistant to measurement

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of their ability to:</p> <ul style="list-style-type: none">• determine relevant data, including variables for decisions• determine factors and variables subject to control• develop strategies for data collection that deliver the greatest overall benefit• implement data collection systems.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none">• workplace procedures and plans relevant to work area• specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee• documentation and information in relation to production, waste, overheads and hazard control/management• reports from supervisors/managers• case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p>

	<p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and
--	--

	<p>proprietary systems</p> <ul style="list-style-type: none"> • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Variables	<p>Variables for this unit are:</p> <ul style="list-style-type: none"> • measurable inputs, outputs or characteristic of processes or operations that have no fixed quantitative value.
Factors	<p>Factors include:</p> <ul style="list-style-type: none"> • any variable that is a part of, contributes to, or leads to the quantum of another variable. Ideally factors themselves should be able to be measured. However, in some operations there may be factors that are resistant to objective measurement (e.g. creativity in design, customer colour preferences and life cycles for new products). In these cases indicators for the value of these factors may need to be developed (e.g. through surveys, approximations or experiments)
Decision	<p>A decision may include:</p> <ul style="list-style-type: none"> • a change, improvement, new/altered process or system which requires data in order to monitor it or

	where data is required to make a decision regarding the selection of alternatives
--	---

Unit Sector(s)

Unit sector Competitive systems and practices

Custom Content Section

Not applicable.

MSS405070A Develop and manage sustainable energy practices

Modification History

New unit, superseding MSACMT670A Develop and manage sustainable energy practices - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to identify opportunities for, and make improvements in, sustainable energy practices in an organisation. Areas covered include efficient use of raw materials, management of waste, electricity conservation, heat conservation and management, water management, environment protection and environment obligations of enterprises.

Application of the Unit

This unit applies to an individual who is required to establish systems for improved energy practices in an organisation. The unit involves analysis of energy used in processes and operations and categorising the energy use according to lean principles. The unit covers categorising energy into necessary use and waste with the waste being further categorised into necessary waste and unnecessary waste. Strategies for eliminating or minimising energy waste are covered with benefit/cost analyses being required for strategies.

This unit primarily requires the application of communication and problem solving skills associated with collecting and analysing information. An ability to analyse energy use of technology or processes will be applied. Initiative and enterprise, and planning and organising are also required to develop plans for efficient energy use. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into the development of processes.

Where the quantum of energy used is not easily available or a formal calculation of energy use is required through an energy balancing calculation (e.g. for regulatory purposes) the unit *MSS015011A Conduct a sustainability energy audit* may also be required.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Analyse energy use	1.1	Identify all energy consuming processes
		1.2	Determine quantity and nature of energy consumed
		1.3	Analyse energy consumed and generated in different parts of the process
		1.4	Determine source of energy consumed in process
2	Develop energy conservation plans	2.1	Determine the efficiency of use of energy by all energy consuming processes
		2.2	Determine causes of low efficiency of use
		2.3	Develop plans for increasing the efficiency of energy use
		2.4	Determine benefit/cost of plans
3	Develop energy trading plans	3.1	Compare energy generating activities with energy consuming activities
		3.2	Determine feasibility of energy consuming activities using energy generated by other activities

		3.3	Develop plans for energy trading
		3.4	Determine benefit/cost of plans
4	Investigate alternative sources of energy	4.1	Develop a specification for energy required
		4.2	Identify a range of sources for that energy
		4.3	Determine benefit/cost for alternative energy sources
5	Develop plans for more efficient energy use	5.1	Compare benefit/costs for different alternatives developed
		5.2	Rank proposals based on benefit/cost compare to limited resources
		5.3	Check proposals meet regulatory requirements
		5.4	Recommend proposals for improving energy efficiency
6	Implement selected plans	6.1	Liaise with relevant people to implement energy efficiency plans
		6.2	Follow through to ensure implementation occurs
		6.3	Monitor implementation and make adjustments, as required
		6.4	Check new energy usage to ensure improvements have occurred

Required Skills and Knowledge

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

Required skills

Required skills include:

- using common units, symbols and formulae common in energy-related calculations
- applying mathematics

- communicating with a variety of groups and individuals using different media
- solving complex problems individually and as part of a team
- reviewing range of existing data for suitability and determining where new data gathering is required
- planning and organising complex whole of organisation activities relating to energy use, including objectives, timelines, implementation procedures and monitoring strategy
- determining where energy balancing techniques are required
- accessing manufacturers' data and other sources of energy consumption for individual equipment and processes
- mapping processes and energy flows
- calculating, manipulating and interpreting numerical data
- ranking energy consumption and waste for area, sites or processes
- calculating the efficiency of use of energy by equipment and processes
- consulting with technical and operative staff on possible non-obvious energy wastes
- consulting and negotiating with stakeholders on implementation process for sustainability improvement

Required knowledge

Required knowledge includes:

- types and sources of energy
- methods of analysing energy efficiency for different types of energy
- methods of converting energy values from one form to another
- alternative sources of energy
- principles of energy efficiency
- relevant regulatory/legislative requirements
- energy trading schemes and procedures
- organisation and process needs for energy

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of their ability to:</p> <ul style="list-style-type: none">• gather appropriate data to allow energy analyses• categorise energy use into necessary use and waste• develop options for energy reduction including
---	---

	<p>presenting of alternatives and benefit/cost analyses</p> <ul style="list-style-type: none"> • develop strategies and plans for energy use and monitor implementation.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise
--	---

	<ul style="list-style-type: none"> the work organisation, culture, regulatory environment and the industry sector
Waste	<p>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.</p> <p>Within operations, categories of waste include:</p> <ul style="list-style-type: none"> excess production and early production delays movement and transport poor process design inventory inefficient performance of a process making defective items activities which do not yield any benefit to the organisation or any benefit to the organisations customers
Necessary waste	<p>Necessary waste is:</p> <ul style="list-style-type: none"> 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	<p>Unnecessary waste is:</p> <ul style="list-style-type: none"> 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	<p>Energy includes:</p> <ul style="list-style-type: none"> all sources of energy used by the process be it electricity, gas or mobile transport fuel <p>The uses of the energy will also be potentially wide and include:</p> <ul style="list-style-type: none"> heating and cooling moving materials (e.g. pumps and conveyors) modifying materials (e.g. cutting, forming, weaving, knitting, reacting, moulding, extruding and mixing) generating pressure/vacuum or providing motive power for equipment and transport
Energy trading	<p>Energy trading means both formal trading where the organisation investigates alternatives to:</p>

	<ul style="list-style-type: none">the buying of energy through alternative suppliers and tender processesselling of excess energy produced by the organisation to energy companies or other producers and <ul style="list-style-type: none">internal trading of excess energy from one area to an energy consuming area elsewhere in the organisation
--	--

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405075A Facilitate the development of a new product

Modification History

Release 2 - Content error in Range and Evidence Guide corrected. Prerequisite unit code corrected - MSS404052A

Release 1 - New unit, superseding MSACMT675A Facilitate the development of a new product* - Equivalent

* New prerequisite *MSS404052A Apply statistics to operational processes* superseding MSACMT452A Apply statistics to processes in manufacturing

Unit Descriptor

This unit of competency covers the skills and knowledge required to facilitate the development of a new or evolutionary product within an existing range of products and encompasses design for manufacture, determining the process capability and the facilitation of its initial production.

Application of the Unit

This competency applies to an individual responsible for the development of a new product. The unit assumes an initial product design has been prepared by a designer and also assumes a working knowledge of all main processes and materials so that an informed choice can be made between them. The person will normally be a manager or technical expert and be required to work closely with a range of other management and operations personnel.

The unit 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 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 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 systems and practices.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MSS404052A Apply statistics to operational processes

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Confirm design brief of new product in consultation with relevant people	1.1	Review product design with customer and other key stakeholders and agree on technical specification, aesthetic requirements, timelines, cost and other market requirements
		1.2	Determine any regulatory, industry code/intellectual property requirements for product
		1.3	Identify any required tooling, process or equipment needs
		1.4	Confirm design brief, including relevant drawings, to meet needs
		1.5	Determine design brief conforms to organisation objectives and capability
		1.6	Obtain approval on total design brief from all relevant personnel
2	Determine material requirements for product	2.1	Select appropriate materials or 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 any 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 new product have been met
 - 4.1 Liaise with equipment design/procurement 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 organisation requirements and capability
- 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 observed
 - 5.4 Coordinate the trialling 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 customer, regulatory and organisation requirements
		8.2	Ensure process specifications are updated and reflect the optimised operation developed
		8.3	Ensure standard operating procedures are correct 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

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

Required skills

Required skills include:

- selecting and justifying the selection of:
 - type of material/material specification
 - appropriate process for a range of product/market applications
 - material and product testing procedures
- applying theoretical principles to predict:
 - properties of product based on materials selected
- identifying effects of processes and processing on the final properties of the product mathematically determine:
 - product cost estimates
 - process time
 - cost/benefit to organisation of new product
- communicating at all levels in the organisation and value stream and to audiences of different levels of literacy and numeracy
- interpreting and making recommendations based on:
 - field test results
 - market analysis data
 - trialling data
 - organisation objectives and business plan
 - equipment and operations capacity

Required knowledge

Required knowledge includes:

- materials, equipment and process sufficient to choose an appropriate combination of materials and process to achieve the end use function of the product
- enterprise procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards

Evidence Guide

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

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of their ability to:</p> <ul style="list-style-type: none"> • ensure the development of a new product meets general organisation guidelines and objectives • liaise with the required people • optimise the process for the new product at the completion of the development phase • assess materials and components characteristics required in a design including material grades and properties and the effects of processing on materials and components • use trial outcomes to determine standard procedures for manufacture and/or operation of new product.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of

	<p>contingencies, improvement scenarios, and so on)</p> <ul style="list-style-type: none"> targeted questioning reports from supervisors, peers and colleagues (third-party reports) portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> lean operations agile operations preventative and predictive maintenance approaches monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems statistical process control systems, including six sigma and three sigma Just in Time (JIT), kanban and other pull-related operations control systems supply, value, and demand chain monitoring and analysis 5S
--	---

	<ul style="list-style-type: none"> • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Organisation objectives and requirements	<p>Organisation objectives and requirements may include:</p> <ul style="list-style-type: none"> • Board or management guidelines on: <ul style="list-style-type: none"> • cost/profit requirements for new products (e.g. minimum return and capital expenditure limits) • encouragement/discouragement of different types of products (e.g. on sustainability, ethical or other non-individual customer related criteria) • potential or actual capacity conflicts with other customers or product/process activities • activities that require/may require community consultation (e.g. on noise or other environmental grounds)
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • understanding of use of all standard processing equipment • relevant personal protective equipment
Typical regulatory requirements	<p>Typical regulatory requirements may include:</p> <ul style="list-style-type: none"> • occupational health and safety (OHS) • environmental regulations • structural codes • product/industry specific requirements
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • defining product end-use requirements in terms

	<p>meaningful to the product design and manufacture</p> <ul style="list-style-type: none">• matching suitable materials and processes to the product needs and company expertise and facilities• matching (and improving) process capability to product tolerances
Relevant factors	<p>Relevant factors may include:</p> <ul style="list-style-type: none">• 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 factors

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS405081A Develop a proactive maintenance strategy

Modification History

New unit, superseding MSACMT681A Develop a proactive maintenance strategy - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to develop and implement a proactive maintenance strategy for an organisation. The unit recognises that there are a number of predictive or proactive maintenance strategies, such as total productive maintenance (TPM) and reliability centred maintenance (RCM).

Application of the Unit

This unit applies to an individual responsible for developing a proactive maintenance strategy for an organisation. Typically the organisation will also be implementing other competitive systems and practices. The unit applies to the selection of appropriate strategies, initial development and implementation as well as application of the strategies to new areas and the improvement of operation in existing areas. This would typically be done in a team environment and in consultation with all key stakeholders.

This unit primarily requires the application of skills associated with communication in gathering, analysing and applying information and consulting with stakeholders. Teamwork, problem solving, initiative and enterprise, and planning and organising are required to develop and implement a predictive maintenance strategy. Strategies will incorporate the maintenance requirements of relevant technologies. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into maintenance strategies.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Determine appropriate analytical techniques	1.1	Liaise with key stakeholders to determine objectives of maintenance strategy
		1.2	Examine current maintenance situation to determine major areas requiring improvement
		1.3	Compare possible strategies, techniques and tools against organisation needs
		1.4	Select possible strategies, techniques and tools
		1.5	Confirm selected strategies, techniques and tools with key stakeholders
2	Develop reliability strategies	2.1	Select preferred maintenance strategy
		2.2	Examine and adapt strategy to organisation needs and priorities
		2.3	Examine and adapt techniques and tools required to implement strategy
		2.4	Liaise with key stakeholders to develop an implementation plan
		2.5	Identify key information and performance indicators required
3	Implement strategy	3.1	Identify data collection required
		3.2	Identify hardware and other resources required

		3.3	Identify skill needs required in consultation with key stakeholders
		3.4	Ensure all resources/training are available
		3.5	Implement strategy
4	Monitor implementation of strategy	4.1	Compare information/performance indicators with desired levels
		4.2	Liaise with key stakeholders regarding strategy issues
		4.3	Identify areas requiring adjustment
		4.4	Make required adjustments

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating with others using a variety of media and techniques
- adapting personal communication strategy to different levels of literacy and numeracy in target individuals and groups
- working in a team
- analysing quantitative and qualitative information to determine proactive maintenance strategy options
- solving problems to root cause
- applying basic arithmetic and statistical techniques
- planning complex strategies, including consideration of timelines, resources, benefit/cost, implementation requirements, and monitoring and adjustment considerations
- reading and interpreting engineering specifications, drawings and charts
- using information system terminals and computers
- prioritising options, including reasons and recommendations
- recording data

Required knowledge

Required knowledge includes:

- characteristics and strengths of different types of strategies, techniques and tools, such as:
 - TPM
 - RCM
 - mean time between failure (MTBF)
 - failure mode effects analysis (FMEA)
 - condition monitoring
 - root cause analysis (RCA)
- holistic costs of different strategies combining cost of maintenance with costs of lost production, sales, and so on, as relevant to the organisation
- business goals sufficient to match the strategy to the business needs
- strategic thinking and its application to proactive maintenance
- principles of process equipment and how to improve its reliability
- resources required and how to obtain them

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • consider a variety of proactive maintenance strategies for suitability to an organisation • consult operators, maintenance, management and other stakeholders in decisions on proactive maintenance strategies • implement selected strategies • monitor performance to selected indicators and make improvements to selected proactive maintenance strategies.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented

	<p>changes to work processes and procedures relevant to the assessee</p> <ul style="list-style-type: none"> • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning for appropriate portions • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
OEE	<p>OEE is the combination of the main factors causing loss of productive capacity from equipment/plant and is:</p> $OEE = \text{availability} \times \text{performance} \times \text{quality rate}$ <p>where:</p> <ul style="list-style-type: none"> • availability takes into account losses due to breakdown, set-up and adjustments • performance takes into account losses due to minor

	<p>stoppages, reduced speed and idling</p> <ul style="list-style-type: none"> quality rate takes into account losses due to rejects, reworks and start-up waste
MTBF	<p>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.</p> <p>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.</p> <p>Depending on the equipment, operations and procedures of the organisation, alternative statistical records of maintenance and maintenance-related events may be substituted for MTBF providing they relate strategies for improving OEE.</p>
FMEA	<p>FMEA is a systematic approach that identifies potential failure modes in a system, product, or operations/assembly operation caused by either design or operations/assembly process deficiencies. It also identifies critical or significant design or process characteristics that require special controls to prevent or detect failure modes. FMEA is a tool used to prevent problems from occurring.</p> <p>Some industry sectors have highly adapted forms of FMEA and may practice traditional FMEA in say their routine maintenance while using another technique, such as Hazard and Operability Studies (HAZOP) for design and modification.</p> <p>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.</p>
Condition monitoring	<p>Condition monitoring is used to describe the process of analysing the implications of condition monitoring data for proactive maintenance whether it be obtained from non destructive testing (NDT) reports, visual assessment by experts, diagnostic reports obtained from SCADA or other enterprise or equipment software and product or process quality analyses. It does not require the actual</p>

	undertaking of the NDT or condition monitoring assessment or test. If this is required appropriate units from other Training Packages will be required.
--	---

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS407002A Review operations practice tools and techniques

Modification History

New unit, superseding MSACMG702A Review manufacturing practice tools and techniques - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to apply continuous improvement to the use of competitive systems and practices 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

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 systems and practices path and is driven by the pull of its customers.

The unit includes checking that the relevant competitive systems and practices 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 systems and practices 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 systems and practices principles.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	Review the use of competitive systems and practices 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
		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 systems and	2.1	Define required further improvements identified
		2.2	Prioritise required further improvements
		2.3	Identify gaps inhibiting tool use

practices tools	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 systems and practices 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

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

Required skills

Required skills include:

- analysing organisation processes and products and match to appropriate competitive systems and practices tools
- undertaking self-directed problem solving and decision-making
- analysing current state/situation
- defining improvement outcomes expected in own area of responsibility from the implementation of competitive systems and practices tools
- communicating across all levels in an organisation
- analysing occupational health and safety (OHS) impacts from implementation of competitive systems and practices tools
- preparing reports and recommendations in regards to implementation of competitive systems and practices tools
- measuring improvement outcomes

Required knowledge

Required knowledge includes:

- competitive systems and practices tools, including:
 - value stream mapping
 - 5S
 - Just in Time (JIT)
 - mistake proofing
 - process mapping
 - establishing customer pull
 - kaizen and kaizen blitz
 - setting of key performance indicators/metrics
- identification and elimination of waste (muda) organisation processes and products applications and limitations of different competitive systems and practices tools
- typical benefits for customers from implementation of competitive systems and practices tools
- DMAIC process applied to competitive systems and practices tool use
- approvals and delegations within the organisation
- procedures, including processes for updating and drafting of procedures

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • critically review the use of competitive tools • take a DMAIC approach • compare actual outcomes to planned outcomes • discriminate between the causes of suboptimal performance • recommend appropriate changes to tools used, tool usage and/or tool implementation.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned,

	<p>currently being implemented, or implemented changes to work processes and procedures relevant to the assessee</p> <ul style="list-style-type: none"> • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Review tool use	<p>Review of tool use includes:</p> <ul style="list-style-type: none"> • 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	<p>Where reference is made to industry codes of practice, and/or Australian/international standards, the latest</p>

	version must be used
HSE	All changes implemented are expected to be at least neutral, or preferably beneficial, in their impact on HSE
Outcomes	Outcomes include: <ul style="list-style-type: none"> the benefits both to the organisation and also the customers
Define improvements	The definition of improvements may include: <ul style="list-style-type: none"> 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
DMAIC approach	DMAIC is an approach to improving an existing business process to reduce defects. It stands for: <ul style="list-style-type: none"> define measure analyse improve control
Organisation	Organisation includes: <ul style="list-style-type: none"> any part of a operations or service organisation companies, government bodies or other body of people aiming to produce a product to service a customer
Team leader	Team leader may include: <ul style="list-style-type: none"> any person who may have either a permanent or an ad hoc role in facilitating the function of a team in a workplace
Gaps inhibiting tool use	Gaps inhibiting tool use may include: <ul style="list-style-type: none"> competency gap of employees in own or other value stream organisation lack of management or employee support lack of financial or other resources inadequate data
<ul style="list-style-type: none"> Sustaining improvement 	Improvement may be sustained by including it in: <ul style="list-style-type: none"> standard procedures and work instructions standard practice

	<ul style="list-style-type: none">• other relevant documents and practices
--	--

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS407007A Respond to a major non-conformance

Modification History

Release 2 - Missing text in PCs reinstated

Release 1 - New unit, superseding MSACMG707A Respond to a major non-conformance - Equivalent

Unit Descriptor

This unit of competency 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 subsections of an organisation, such as a team, area or department, or in the case of a small or medium sized enterprise (SME), to the whole organisation.

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 stream, 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 systems and practices principles.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	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	2.1	Develop possible responses appropriate to the situation

	priorities and actions	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	Determine root cause of non-conformance and analyse to determine likely preventative measures
		5.2	Develop remedial plan to eliminate root cause
		5.3	Obtain sign-off from process/system owner for 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

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

Required skills

Required skills include:

- undertaking self-directed problem solving and decision-making
- communicating across all levels in an organisation
- identifying obvious and not obvious non-conformances based on analyses of team or area key performance indicators (KPIs)
- determining and prioritising business impacts of non-conformance based on analysis of key indicators, such as:
 - effect on error rates and defects
 - loss of or delay in supply of materials or components
 - loss or severe restriction of process capability
 - loss of transport from or to operational centre or process facility
 - unplanned increases in costs of materials or services
 - increases in the cost of finance/capital
 - sudden change in regulatory requirements
- determining and prioritising responses based on:
 - customer requirements
 - the philosophies and strategies of the organisation
 - HSE requirements
 - delivery, statutory and contractual requirements
- negotiating formally and informally in highly varied and/or highly specialised contexts and while under time constraints and pressure from others

- solving problems to root cause, including analysis of implications of root cause
- establishing HSE environment of the team or area and determine HSE impact of a non-conformance

Required knowledge

Required knowledge includes:

- the importance of standardisation in competitive systems and practices
- organisation processes and products
- customer needs as distinct from wants
- communication using a variety of media and formats methods
- sources of additional assistance and resources within the organisation
- approvals and delegations within the organisation

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • recognise extent and nature of a major non-conformance and deal effectively with a • define the impact of the non-conformance on operations and customers • develop and prioritise appropriate responses to contain the impacts of the non-conformance • implement, monitor and modify responses.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard

	<p>control/management</p> <ul style="list-style-type: none"> • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations
--	---

	<ul style="list-style-type: none"> • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
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	<p>A major non-conformance may be:</p> <ul style="list-style-type: none"> • 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

	<ul style="list-style-type: none"> • a commercial or legal problem which affects the ability to produce to requirements • excessive absences of key personnel due to illness or transport breakdown • a security situation preventing key personnel from performing their duties and/or deliveries being made • a major supply shortage or price increase
<ul style="list-style-type: none"> • Business impacts 	<p>Business impacts may include:</p> <ul style="list-style-type: none"> • sudden increase in defect rates • loss of supply of materials or components • loss or severe restriction of operational capability • loss of transport from process • increases in fuel energy costs • increases in the cost of finance/capital
Performance	<p>Performance includes:</p> <ul style="list-style-type: none"> • the production volume, quality, cost, HSE and similar measures as appropriate at the team level
Response	<p>Response includes all those strategies which will minimise the impact of the non-conformance on the customer and must be consistent with:</p> <ul style="list-style-type: none"> • the philosophies and strategies of the organisation • HSE requirements • delivery, statutory and contractual requirements <p>Response may include:</p> <ul style="list-style-type: none"> • supply from another source • production from other areas • agreements for reduced supply • agreements to accept different quality <p>Response duration may include:</p> <ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Timing of responses 	<p>Timing of response may be controlled by the nature of the non-conformance and may include:</p> <ul style="list-style-type: none"> • implementation following initial containment/stabilisation of situation (e.g. where the non-conformance is a major incident, such as a fire or loss of containment) • immediate initiation but delayed implementation (e.g.

	<p>where the non-conformance is a breakdown of critical plant/equipment which will require repair/replacement before implementation)</p> <ul style="list-style-type: none">• 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)
HSE	All changes implemented are expected to be at least neutral, or preferably beneficial, in their impact on HSE
Stakeholders	<p>Stakeholders may include:</p> <ul style="list-style-type: none">• work team members, value stream members as well as other stakeholders and may be internal and external to the team and possibly the organisation
Team leader	<p>Team leader may include:</p> <ul style="list-style-type: none">• 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

Competitive systems and practices

Custom Content Section

Not applicable.

MSS407012A Lead a problem solving process to determine and solve root cause

Modification History

New unit, superseding MSACMG712A Lead a problem solving process to determine and solve root cause - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to guide or lead 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

This unit will typically be undertaken by managers and/or technical experts who are 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 organisation or in the value stream and may have been formally presented to the individual for consideration or arise as part of other work.

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

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	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
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 |
| 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

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

Required skills

Required skills include:

- cooperating and working with others, both internally and externally to the work group
- researching and collating information from a variety of sources, including non-obvious sources
- analysing and planning in highly varied and/or highly specialised contexts
- quantitative and qualitative data interpretation and application skills
- communicating effectively (both receiving and sending communications)
- applying problem solving methodology, including:

- cross-functional problem solving team
- cross-functional nominal group (virtual team)
- consulting and or brainstorming with members from outside the organisation on some basis
- input from other members of the value stream
- the use of known/proprietary problem solving approaches or some synthesis of methods
- own or commissioned research either in whole or in part
- prioritising possible solutions on benefit/cost basis and value to the customer
- selecting solution and checking efficacy, including checking:
 - the solution breaks the causal tree
 - other causes are not able to cause the problem
 - benefit/cost ratio is acceptable
 - solution can be implemented
 - permanence of solution
- standardising solutions by:
 - checking that implemented solution solves the problem
 - solution can be applied to all relevant standards within the organisation, including:
 - standard operating procedures/work instructions
 - actual work practice
 - maintenance manuals and similar
 - product and/or process specifications

Required knowledge

Required knowledge includes:

- organisational goals, products and processes
- sources of data (actual and possible) within the organisation and the value stream
- understanding of the techniques and methodologies of formal problem solving
- data required for problem solving and alternative/proxy data sources
- benefit/cost analysis

Evidence Guide

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

Critical aspects for assessment and	A person who demonstrates competency in this unit must
--	--

evidence required to demonstrate competency in this unit	<p>be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • undertake complex problem identification • establish appropriate methodologies, including establishing team responsibilities, to achieve root cause identification • prioritise solutions • recommend solutions and implementation procedures within the organisation and the value stream • evaluate implementation of solutions • standardise solutions.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to</p>

	accommodate ethnicity, age, gender, demographics and disability.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull- related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree
--	--

	<p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> the stage of implementation of competitive systems and practices the size of the enterprise the work organisation, culture, regulatory environment and the industry sector
Complex problem	<p>A complex problem may be described as one which has several of the following characteristics:</p> <ul style="list-style-type: none"> requires going into the value stream 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: <ul style="list-style-type: none"> significant specialist knowledge significant specialist skill more theory/understanding of technology or process data is not easily available and may need particular strategies to obtain, such as: <ul style="list-style-type: none"> overcoming resistance from people including employees, customers or suppliers extracting data not regularly reported from 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
<ul style="list-style-type: none"> Problem recognition 	<p>The problem recognition may include:</p> <ul style="list-style-type: none"> 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 <p>The problem may, or may not be capable of complete definition at the start of the problem solving process (so requiring an iterative process)</p>
Group	<p>Problem will be such that it is beyond the scope of an individual to solve and so a group is required. The group</p>

	<p>may be:</p> <ul style="list-style-type: none">• real (i.e. physical or face to face)• nominal (i.e. never meets and may not know who each other is)• or any combination in between
--	---

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.

MSS407013A Review continuous improvement processes

Modification History

New unit, superseding MSACMG700A Review continuous improvement processes - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to undertake the local level review and further development of an existing continuous improvement process.

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 systems and practices environment through either previous study or industry experience. Where this is not the case MSS403010A Facilitate change in an organisation implementing competitive systems and practices 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 a small or medium sized enterprise (SME). This unit may also be applied to service organisations applying competitive systems and practices principles.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the Performance criteria describe the performance needed to

essential outcomes of a unit of competency.

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

Elements and Performance Criteria

1	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
		1.6	Identify areas for improvement to KPIs and continuous improvement processes
2	Develop plan for enhancing improvement processes	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 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 systems and practices 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

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

Required skills

Required skills include:

- reviewing continuous improvement in a variety of contexts (e.g. supportive and non-supportive team environments)
- undertaking self-directed problem solving and decision-making
- communicating across all levels in the organisation
- analysing current state/situation
- analysing workplace strategy and vision statements and principles and linking these to current processes, performance and indicators

Required knowledge

Required knowledge includes:

- competitive systems and practices tools, including:
 - value stream mapping

- 5S
- Just in Time (JIT)
- mistake proofing
- process mapping
- establishing customer pull
- kaizen and kaizen blitz
- setting of KPIs/metrics
- identification and elimination of waste (muda)
- methods of determining competency gaps in team members
- continuous improvement processes, including implementation, monitoring and evaluation strategies
- types of KPIs and their impacts on performance
- relationship between service departments (e.g. maintenance and continuous improvement in a production or operational environment)
- difference between breakthrough improvement and continuous improvement

Evidence Guide

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

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>A person who demonstrates competency in this unit must be able to provide evidence of the ability to:</p> <ul style="list-style-type: none"> • critically review existing or proposed continuous improvement processes • establish ongoing review processes, including setting and monitoring of KPIs • develop consensus for implementation of improvement plans • implement improvement plans.
Context of and specific resources for assessment	<p>Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices.</p> <p>Access may be required to:</p> <ul style="list-style-type: none"> • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee

	<ul style="list-style-type: none"> documentation and information in relation to production, waste, overheads and hazard control/management reports from supervisors/managers case studies and scenarios to assess responses to contingencies.
Method of assessment	<p>A holistic approach should be taken to the assessment.</p> <p>Competence in this unit may be assessed by using a combination of the following to generate evidence:</p> <ul style="list-style-type: none"> demonstration in the workplace workplace projects suitable simulation case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) targeted questioning reports from supervisors, peers and colleagues (third-party reports) portfolio of evidence. <p>In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competitive systems and practices	<p>Competitive systems and practices may include, but are not limited to:</p> <ul style="list-style-type: none"> lean operations
--	---

	<ul style="list-style-type: none"> • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • JIT, kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree <p>Competitive systems and practices should be interpreted so as to take into account:</p> <ul style="list-style-type: none"> • the stage of implementation of competitive systems and practices • the size of the enterprise • the work organisation, culture, regulatory environment and the industry sector
Codes of practice/standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used
HSE	All changes implemented should be at least neutral, or preferably beneficial, in their impact on HSE
Relevance	<p>Relevance of KPIs includes:</p> <ul style="list-style-type: none"> • appropriateness (did they lead to/encourage desirable performance?) • currency (are they still encouraging desirable performance?)

	<ul style="list-style-type: none"> • 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	<p>Outcomes include comparing:</p> <ul style="list-style-type: none"> • cost/benefit • timing • value stream implications • HSE issues • process reliability issues • benefit to customer/perceived customer benefit
Required resources	<p>Required resources include:</p> <ul style="list-style-type: none"> • plant • materials (e.g. raw materials, components, work in progress and other consumables) • energy (e.g. heating, cooling and fuel) • people • skills • finances • feedback/visual enterprise resources • measuring equipment
Sustaining improvement	<p>Improvement may be sustained by including it in:</p> <ul style="list-style-type: none"> • standard procedures and work instructions • standard practice • other relevant documents and practices
Team leader	<p>Team leader may include:</p> <ul style="list-style-type: none"> • 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

Competitive systems and practices

Custom Content Section

Not applicable.

PMC552002C Operate equipment to blend/mix materials

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the selection and blending/mixing of materials using blending/mixing equipment. It involves loading and unloading equipment, monitoring the process, maintaining a safe work environment and conducting routine maintenance.
------------------------	---

Application of the Unit

Application of the unit	<p>This unit of competency applies to operators who are responsible for selecting and blending a variety of materials to produce a variety of products.</p> <p>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.</p> <p>If manual handling forms part of this job then regulatory obligations will require competency in <i>PMBHAN103C Shift materials safely by hand</i>.</p> <p>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.</p>
--------------------------------	--

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
	<p>as required by specifications and standard procedures</p> <p>3.2. Prepare and add materials to blender/mixer as required by specification and standard procedures</p> <p>3.3. Check that materials prepared match requirements</p> <p>3.4. Use ancillary equipment as required according to standard procedures</p> <p>3.5. Ensure equipment is operated in accordance with established enterprise procedures</p> <p>3.6. Blend/mix materials to obtain required results</p>
4. Monitor and record operation	<p>4.1. Monitor equipment performance in accordance with work instructions and manufacturer's specifications</p> <p>4.2. Monitor non-conforming product against customer specifications</p> <p>4.3. Adjust and control equipment to ensure correct product quality</p> <p>4.4. Complete final inspection checks</p> <p>4.5. Complete appropriate records and logs</p>
5. Rectify routine problems	<p>5.1. Identify the range of faults that can occur during the operation</p> <p>5.2. Determine and rectify fault causes in accordance with procedures/work instructions</p> <p>5.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions</p> <p>5.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions</p> <p>5.5. Identify non-routine problems and report to designated person</p>
6. Maintain blending/mixing plant and area	<p>6.1. Keep area and equipment clean and in good order</p> <p>6.2. Unload and shut down equipment as required</p> <p>6.3. Respond to routine faults according to enterprise procedures</p> <p>6.4. Report non-routine faults according to enterprise procedures</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<p>It is essential that the equipment be understood and that the importance of critical material properties, settings and readings is known.</p> <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p> <p>Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

EVIDENCE GUIDE	
	<p>It may also be appropriate to assess this unit in conjunction with:</p> <ul style="list-style-type: none"> MSAC112003A Undertake manual handling. <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions.
Equipment and unit operations	<p>All such items of equipment and unit operations must form part of a discrete blending/mixing system. These may include:</p> <ul style="list-style-type: none"> 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	<p>Typical problems may include:</p> <ul style="list-style-type: none"> equipment malfunction material handling such as equipment failure and blockages material property variation blend/mix tolerance uniform dispersion of minor

RANGE STATEMENT	
	ingredients/additives <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for preparing materials for grinding; grinding materials and distributing ground materials.</p> <p>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.</p>
--------------------------------	--

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	<p>1.1. Check equipment for hazards, danger and isolation tags in accordance with standard operating procedures</p> <p>1.2. Perform checks to ensure all doors, inspection openings and guards are in position and secure</p> <p>1.3. Make adjustments to equipment settings to ensure conformance with standard operating procedures</p> <p>1.4. Notify appropriate personnel of intention to start equipment</p> <p>1.5. Conduct additional pre-start checks as required in accordance with standard operating procedures</p> <p>1.6. Ensure an adequate supply of materials is available to meet production requirements</p>
2. Grind materials	<p>2.1. Start equipment in sequence in accordance with standard operating procedures</p> <p>2.2. Monitor instrument/control panels and adjust as necessary to remain within specified operating parameters</p> <p>2.3. Make physical inspections of plant and equipment at specified intervals to identify any anomalies in standard operating procedures</p> <p>2.4. Maximise product throughput and efficiency to maintain target parameters</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>2.5. Communicate with appropriate personnel regarding the status of operations in line with enterprise requirements</p> <p>2.6. Employ safe working practices which conform with occupational health and safety (OHS) and enterprise requirements</p> <p>2.7. Shut down equipment in accordance with procedures and complete required records</p>
3. Rectify routine problems	<p>3.1. Identify the range of faults that can occur during the operation</p> <p>3.2. Determine and rectify faults caused by procedures</p> <p>3.3. Identify and rectify equipment failure causes in accordance with procedures</p> <p>3.4. Make sure appropriate records and log books of equipment operations are maintained to meet procedures</p> <p>3.5. Identify non-routine problems and report to designated person</p>
4. Distribute ground product	<p>4.1. Distribute ground materials to their correct silo/storage area in accordance with standard operating procedures</p> <p>4.2. Monitor silo/storage areas to ensure compliance with enterprise storage quality/quantity requirements.</p>
5. Control hazards	<p>5.1. Identify hazards in the grinding work area</p> <p>5.2. Assess the risks arising from those hazards</p> <p>5.3. Implement measures to control those risks in line with procedures</p> <p>5.4. Shut down in an emergency as required</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	
	<p>be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating</p>

RANGE STATEMENT	
conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Procedures	All operations are performed in accordance with standard procedures and work instructions.
Ground materials	Ground materials may include: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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	<p>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.</p> <p>This competency is typically performed by operators working either independently or as part of a team.</p>
--------------------------------	--

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	<p>It is essential that the process be understood and that the importance of critical material properties and settings is known.</p> <p>Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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</p>

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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Equipment and machinery	<p>Equipment and machinery may include:</p> <ul style="list-style-type: none"> any processing plant or equipment relevant to this unit of competency
Operation of machinery/equipment	<p>Operation of machinery/equipment include:</p> <ul style="list-style-type: none"> visual checks for damage leaks obstructions blockages component wear
Materials	<p>Raw materials may include:</p> <ul style="list-style-type: none"> first stage products being prepared for subsequent processes
Typical problems	Typical problems may include:

RANGE STATEMENT	
	<ul style="list-style-type: none"> 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	<p>This unit of competency applies to operators who are responsible for conducting activities relevant to the preparation and processing of greenware or green products.</p> <p>It does NOT cover the firing of products in a kiln or similar firing equipment. It does cover warmed or heated curing areas.</p> <p>This unit of competency is typically performed by operators working either independently or as part of a team.</p>
--------------------------------	--

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: <ul style="list-style-type: none"> • clay and ceramics products prior to firing • fibre reinforced cement products prior to autoclaving • concrete products such as masonry curing
Equipment	Equipment may include: <ul style="list-style-type: none"> • hand tools • templates • drying area, cabinets, tunnel, curing kiln • transfer cars, kiln cars, trolleys, shelving or racks • temperature measuring equipment

RANGE STATEMENT	
	<ul style="list-style-type: none"> moisture measuring equipment (e.g. infra-red moisture meter)
Finishing	<p>Finishing includes operations, such as:</p> <ul style="list-style-type: none"> brushing dressing fettling linishing sanding sponging stacking edge trimming
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> 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)	<p>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</p>

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	<p>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.</p> <p>The unit of competency is typically performed by operators working either independently or as part of a work team.</p>
--------------------------------	--

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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Variations	<p>Variations may include:</p> <ul style="list-style-type: none"> nature and type of plant configuration

RANGE STATEMENT	
	<ul style="list-style-type: none"> • 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	<p>Checking equipment includes:</p> <ul style="list-style-type: none"> • vessel door closing and locking equipment • vessel cars • steam and pressure generation equipment
Use of equipment	<p>Use of equipment includes:</p> <ul style="list-style-type: none"> • instruments and PLCs but not control panels • measuring and/or recording equipment • communication equipment
Typical problems	<p>Typical problems include:</p> <ul style="list-style-type: none"> • equipment malfunctions • temperature or pressure fluctuations • product quality variations • material/feed variations • vessel pressure losses
Occupational health and safety (OHS)	<p>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.</p>

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	<p>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.</p> <p>This unit of competency is typically performed by operators working either independently or as part of a work team.</p>
--------------------------------	--

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	
	<p>action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work</p>

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Procedures	All operations are performed in accordance with standard procedures and work instructions.
Operation of steam chambers	<p>This unit includes the operation of various steam chambers for the curing of concrete products and pipes and may include:</p> <ul style="list-style-type: none"> • purpose built, low pressure steam chambers • autoclaves (high or low pressure) • temporary means of retaining low pressure steam near the curing concrete product
Variations	<p>Variations include:</p> <ul style="list-style-type: none"> • 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	<p>Checking equipment includes:</p> <ul style="list-style-type: none"> • chamber doors and locking equipment • transfer cars to fill chambers • steam and pressure generation equipment • pressure and temperature gauges
Equipment	<p>Equipment may include:</p> <ul style="list-style-type: none"> • instruments and PLCs but not control panels • measuring and/or recording equipment • communication equipment • tarpaulins used to cover concrete
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for the crushing and screening of materials.</p> <p>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.</p>
--------------------------------	---

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	
	<ul style="list-style-type: none"> • signage, tags and isolation procedures are followed • basic maintenance and inspection practices are carried out. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions

RANGE STATEMENT	
Materials	<p>Materials may include:</p> <ul style="list-style-type: none"> • quarried materials • feedstock • waste materials • ground minerals industries • concrete waste
Equipment and unit operations	<p>This unit of competency includes all such items of equipment and unit operations which form part of the crushing system. These may include:</p> <ul style="list-style-type: none"> • jaw crushers • cone crushers • grizzlies • grids • other equipment integral to the operation of the crushing system
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • difficult material to be crushed • variations in temperature and moisture • variations in feed • product discharge problems • blocked screens • oversized feed
OHS	<p>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</p>

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	<p>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.</p> <p>The type of operation will depend on:</p> <ul style="list-style-type: none">• nature and type of plant configuration• type of manufacturing process as to whether wet, dry or semi-dry. <p>This unit does NOT require the operation of a central control panel.</p> <p>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.</p>
--------------------------------	--

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	
	<p>potential situations requiring action and then in implementing appropriate corrective action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • startup and shutdown occurs first time • signals and alarms are responded to immediately • all OHS requirements are followed. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT
The range 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	<p>This unit includes all such items of equipment and unit operations which form part of the kiln system. These may include:</p> <ul style="list-style-type: none"> • instrument panels (local) • measuring and recording equipment • communication equipment • hand tools • emergency stop buttons and lanyards • safety clothing and equipment
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for following procedures to make slip cast products.</p> <p>This competency includes the operation of all ancillary equipment.</p> <p>This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic work.</p> <p>It does NOT include drying, firing or finishing operations.</p> <p>This unit of competency is typically performed by operators working either independently or as part of a team.</p>
--------------------------------	--

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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Operation of equipment	<p>This unit includes the operation of equipment used for the casting of clay and ceramic products. It includes the processes:</p> <ul style="list-style-type: none"> • casting (including medium pressure casting) • punching • palleting • sponging and fettling • use of hand tools <p>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</p>
Product requirements	<p>Product requirements include:</p> <ul style="list-style-type: none"> • 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	
	<ul style="list-style-type: none"> • 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	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for operating glazing, printing and finishing equipment to complete fired products.</p> <p>This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic work.</p> <p>It does NOT include:</p> <ul style="list-style-type: none">• product forming and drying• product firing• setting up automated glazing equipment. <p>This competency is typically performed by operators working either independently or as part of a team.</p>
--------------------------------	--

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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	
	<p>gathering evidence of operating ability over a range of situations.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Products	<p>Products may include:</p> <ul style="list-style-type: none"> • cups, saucers • tiles • bricks • sanitary ware • bathroom fittings • insulators
Equipment	Equipment may include:

RANGE STATEMENT	
	<ul style="list-style-type: none"> • belt feed hopper • dipping equipment • hand spray equipment • screen printers • silk screens • vibrating hoppers
Processes	<p>Processes may include:</p> <ul style="list-style-type: none"> • 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	<p>Materials may include:</p> <ul style="list-style-type: none"> • artwork • colours • cover coat • dry glaze dusts • frits • glazed products • liquid glaze • paints • sand • slurry
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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)	<p>All operations are subject to stringent OHS requirements and these must not be compromised at any time. Where there is an apparent conflict</p>

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	<p>This unit of competency applies to operators who are responsible for using equipment to load and prepare clays and other materials for ceramic production.</p> <p>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.</p> <p>This competency does NOT include bulk raw materials blending and forming processes.</p> <p>This competency is typically performed by operators working either independently or as part of a team.</p>
--------------------------------	--

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	<p>This unit may be assessed in conjunction with:</p> <ul style="list-style-type: none"> • <i>PMC552002B Operate equipment to blend/mix materials.</i> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Materials	<p>Materials may include:</p> <ul style="list-style-type: none"> • additives • body materials • glaze pigments and stains • slip • waste
Equipment	<p>Equipment may include:</p> <ul style="list-style-type: none"> • ball mill • blunger • bobcat • box feeder

RANGE STATEMENT	
	<ul style="list-style-type: none"> • 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	<p>Processes may include:</p> <ul style="list-style-type: none"> • batch • continuous • dry materials • wet materials
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • adjustments to allow for materials variations • equipment malfunction • contamination
Occupational health and safety (OHS)	<p>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</p>

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	<p>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.</p> <p>This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic work.</p> <p>It does NOT include initial forming or firing, or packaging.</p>
--------------------------------	--

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	<p>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:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>This unit may be assessed in conjunction with:</p> <ul style="list-style-type: none"> • PMC561080B Organise self • MSAPMSUP106A Work in a team • MSAPMOHS200A Work safely. <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes</p>
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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • bisque • glost • decoration
Materials and processes	This unit includes: <ul style="list-style-type: none"> • materials from: <ul style="list-style-type: none"> • adhesives • cisterns • inserts • insulators • jugs • switch gear • tiles • tessellations • pipes • processes including: <ul style="list-style-type: none"> • foot polishing • hand assembly • measurements

RANGE STATEMENT	
	<ul style="list-style-type: none"> • pin grinding • sorting • tile splitting • operation of all ancillary equipment including: <ul style="list-style-type: none"> • automatic and manual foot polishers • bench and hand grinders • colour standards • jigs • rulers and tapes • templates • PLCs (but not control panels)
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • determination of surface quality within specification • colour, shape, structure and surface finish faults • repairing or scrapping of damaged parts
Occupational health and safety (OHS)	<p>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</p>

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	<p>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.</p> <p>This unit involves the hand moulding of clay, ceramic, plaster and other products and may also be relevant to craft practitioners producing ceramic work.</p> <p>This competency is typically performed by operators working either independently or as part of a team.</p>
--------------------------------	--

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	
	<ul style="list-style-type: none"> • basic mould or former maintenance and inspection practices are carried out.
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • maintaining correct distribution and compaction of materials • maintaining sectional profiles in accordance

RANGE STATEMENT	
	with specifications <ul style="list-style-type: none"> 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	<p>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.</p> <p>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.</p>
--------------------------------	---

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
	<p>contents</p> <p>3.3. Monitor and adjust kiln heating equipment (elements or burners) and record temperature gradient details</p> <p>3.4. Monitor the kiln atmosphere</p> <p>3.5. Monitor for correct operation of kiln</p> <p>3.6. Move kiln car or kiln contents to the appropriate storage area</p> <p>3.7. Check and record condition of products leaving the kiln</p>
4. Rectify routine problems	<p>4.1. Identify the range of faults that can occur during the operation</p> <p>4.2. Determine and rectify fault causes in accordance with procedures/work instructions</p> <p>4.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions</p> <p>4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions</p> <p>4.5. Identify non-routine problems and report to designated person</p>
5. Control hazards	<p>5.1. Identify hazards in kiln work area</p> <p>5.2. Assess the risks arising from those hazards</p> <p>5.3. Implement measures to control those risks in line with procedures and duty of care</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions

RANGE STATEMENT	
Clay and ceramic products	<p>Clay and ceramic products may include:</p> <ul style="list-style-type: none"> • bricks • tiles and pipes • ceramic products • crockery • sanitary ware • insulators or thermal ceramics
Equipment and unit operations	<p>This unit includes all such items of equipment and unit operations which form part of the kiln system. These may include:</p> <ul style="list-style-type: none"> • 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	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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)	<p>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</p>

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	<p>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.</p> <p>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.</p> <p>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.</p>
--------------------------------	---

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
	<p>required</p> <p>3.3. Monitor operations and adjust/refill as required</p> <p>3.4. Apply glazing material as required</p>
4. Unload and shut down extrusion equipment	<p>4.1. Unload and shut down extrusion equipment at conclusion of the production run to requirements</p> <p>4.2. Clean up work area and perform housekeeping duties</p> <p>4.3. Store materials appropriately</p>
5. Rectify routine problems	<p>5.1. Identify the range of faults that can occur during the operation</p> <p>5.2. Determine and rectify fault causes in accordance with procedures/work instructions</p> <p>5.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions</p> <p>5.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions</p> <p>5.5. Identify non-routine problems and report to designated person</p>
6. Control hazards	<p>6.1. Identify hazards in extruder work area</p> <p>6.2. Assess the risks arising from those hazards</p> <p>6.3. Implement measures to control those risks in line with procedures and duty of care</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with 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	
	<p>system. These may include:</p> <ul style="list-style-type: none"> • 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	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • moisture content not within specifications • maladjustment of the cutting wires • damage to the product
Occupational health and safety (OHS)	<p>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</p>

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	<p>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.</p> <p>This unit does NOT apply to extruding, slip forming, or manual forming.</p> <p>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.</p>
--------------------------------	--

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	<p>4.1. Identify the range of faults that can occur during the operation</p> <p>4.2. Determine and rectify fault causes in accordance with procedures/work instructions</p> <p>4.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions</p> <p>4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions</p> <p>4.5. Identify non-routine problems and report to designated person</p>
5. Control hazards	<p>5.1. Identify hazards in pressing work area</p> <p>5.2. Assess the risks arising from those hazards</p> <p>5.3. Implement measures to control those risks in line with procedures and duty of care</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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: <ul style="list-style-type: none"> • moulds • presses • press dies • PLCs where fitted
Typical problems	Typical problems may include: <ul style="list-style-type: none"> • moisture content not within specifications • unsatisfactory alignment • damage to the product

RANGE STATEMENT	
	<ul style="list-style-type: none"> • 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	<p>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.</p> <p>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>.</p> <p>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.</p>
--------------------------------	--

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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Required skills include

- 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	
	<p>recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with:</p> <ul style="list-style-type: none"> • <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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Melting equipment	<p>This unit includes melting equipment applicable to each of the specific areas of glass products manufacture. These may include:</p> <ul style="list-style-type: none"> • flat glass • insulation, glass wool insulation, laminated blankets, roll and boards • fibreglass and glass filaments • packaging, bottles and jars
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • furnaces and associated equipment • gas stations • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Process and products	<p>Process and products include:</p> <ul style="list-style-type: none"> • melting, refining and conditioning of raw material, including frit and other recycled glass materials, to produce glass for forming

RANGE STATEMENT	
	<p>processes</p> <p>It does NOT include processes involved with:</p> <ul style="list-style-type: none"> • scientific glass • secondary processes • the softening of already made glass
Plant data	<p>Plant data includes:</p> <ul style="list-style-type: none"> • 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	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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)	<p>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.</p>

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	<p>This unit of competency applies to operators who are responsible for operating process ovens.</p> <p>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>.</p> <p>This competency includes the operation of all ancillary equipment.</p> <p>It does NOT include processes involved with:</p> <ul style="list-style-type: none">• melting furnaces used in glass production• forming of glass products directly from a melting furnace. <p>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.</p>
--------------------------------	--

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	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with:</p> <ul style="list-style-type: none"> MSAPMSUP292A Sample and test materials and product. <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Line equipment	<p>Line equipment includes:</p> <ul style="list-style-type: none"> 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	
	<ul style="list-style-type: none"> • packaging, bottles and jars • automotive glass • flat glass
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • 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	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • temperature and pressure problems • equipment problems • quality problems
Occupational health and safety (OHS)	<p>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</p>

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	<p>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.</p> <p>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.</p>
--------------------------------	---

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
	<p>requirements</p> <p>2.6.Document and maintain records and production results according to enterprise requirements</p> <p>2.7.Identify processing problems and report to a designated person for rectification</p>
3. Rectify routine problems	<p>3.1.Identify the range of faults that can occur during the operation</p> <p>3.2.Determine and rectify fault causes by procedures</p> <p>3.3.Identify and rectify equipment failure causes in accordance with procedures</p> <p>3.4.Ensure appropriate records and log books of equipment operations are maintained to meet procedures</p> <p>3.5.Identify non-routine problems and report to designated person</p>
4. Control hazards	<p>4.1.Identify hazards from the job to be done</p> <p>4.2.Identify other hazards in the work area</p> <p>4.3.Assess the risks arising from those hazards</p> <p>4.4.Implement measures to control those risks in line with procedures</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	
	<ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and 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	<p>This unit of competency applies to operators who are responsible for operating float forming equipment within the manufactured mineral products industry.</p> <p>This competency includes the operation of all ancillary equipment.</p> <p>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.</p>
--------------------------------	---

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
	<p>according to standard procedures</p> <p>3.4. Use and monitor ancillary equipment and safety procedures in accordance with enterprise requirements</p> <p>3.5. Maintain records according to enterprise requirements</p>
4. Rectify routine problems	<p>4.1. Identify the range of faults that can occur during the operation</p> <p>4.2. Determine and rectify fault causes in accordance with procedures</p> <p>4.3. Identify and rectify equipment failure causes in accordance with procedures</p> <p>4.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures</p> <p>4.5. Identify non-routine problems and report to designated person</p>
5. Control hazards.	<p>5.1. Identify hazards from the job to be done</p> <p>5.2. Identify other hazards in the work area</p> <p>5.3. Assess the risks arising from those hazards</p> <p>5.4. Implement measures to control those risks in line with procedures</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	
	<ul style="list-style-type: none"> 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>

RANGE STATEMENT	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Equipment	Equipment may include: <ul style="list-style-type: none"> • bath • ancillary equipment • computers • measuring recording equipment • communication equipment • hand tools • safety clothing and equipment
Typical problems	Typical problems may include: <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for operating, monitoring and maintaining float forming equipment within the manufactured mineral products industry.</p> <p>This competency includes the operation of all ancillary equipment.</p> <p>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.</p>
--------------------------------	---

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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

Required skills include:

- 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	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
Guidance information for	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy</p>

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	<p>This unit of competency applies to operators who are responsible for operating container forming equipment within the manufactured mineral products industry.</p> <p>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>.</p> <p>This competency includes the operation of all ancillary equipment. It does NOT include melting, furnace or raw materials, annealing lehr and packing and handling.</p> <p>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.</p>
--------------------------------	---

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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	
	<p>hygiene standards.</p> <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>This unit may be assessed in conjunction with:</p> <ul style="list-style-type: none"> • <i>MSAPMOPS212A Use enterprise computers or data systems.</i> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and</p>

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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for preparing and operating glass printing equipment within the manufactured mineral products industry.</p> <p>This competency includes the operation of all ancillary equipment.</p> <p>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.</p>
--------------------------------	--

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	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites or co-requisites relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Finishing equipment	<p>This unit includes finishing equipment applicable to each of the specific areas of glass products manufacture:</p> <ul style="list-style-type: none"> • flat glass • automotive glass
Equipment	<p>Equipment may include:</p> <ul style="list-style-type: none"> • printing and edgework equipment • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for operating and maintaining primary annealing equipment within the manufactured mineral products industry.</p> <p>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>.</p> <p>This competency includes the operation of all ancillary equipment.</p> <p>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.</p>
--------------------------------	--

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
	<p>2.2. Complete the steps preparing for shutting down annealing equipment in normal and abnormal situations</p> <p>2.3. Start up the annealing equipment as required</p> <p>2.4. Shut down the annealing equipment as required</p>
3. Operate annealing equipment	<p>3.1. Operate annealing equipment to ensure quality specifications are met</p> <p>3.2. Make operation adjustments according to established procedures and ensure product quality and specifications are maintained</p> <p>3.3. Use and observe ancillary equipment and safety procedures in accordance with enterprise requirements</p> <p>3.4. Document and maintain records and production results according to enterprise requirements</p>
4. Monitor, adjust and record annealing operation	<p>4.1. Monitor equipment operation to maintain product quality and specifications</p> <p>4.2. Measure and record operating parameters according to enterprise requirements</p> <p>4.3. Conduct product sampling and quality control checks according to standard procedures to ensure and maintain annealing specifications</p> <p>4.4. Adjust annealing equipment controls to ensure glass parameters are maintained to job specifications</p> <p>4.5. Record results in accordance with work instructions</p>
5. Rectify routine problems	<p>5.1. Identify the range of faults that can occur during the operation</p> <p>5.2. Determine and rectify fault causes in accordance with procedures</p> <p>5.3. Identify and rectify equipment failure causes in accordance with procedures</p> <p>5.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures</p> <p>5.5. Identify non-routine problems and report to designated person</p>
6. Control hazards.	<p>6.1. Identify hazards from the job to be done</p> <p>6.2. Identify other hazards in the work area</p> <p>6.3. Assess the risks arising from those hazards</p> <p>6.4. Implement measures to control those risks in line</p>

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	
	<p>will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites or co-requisite units relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	<p>All operations are performed in accordance with standard procedures and work instructions</p>
Finishing equipment	<p>This unit includes finishing equipment applicable to each of the specific areas of glass products manufacture, including:</p> <ul style="list-style-type: none"> flat glass packaging, bottles and jars
Equipment	<p>Equipment may include:</p> <ul style="list-style-type: none"> lehr and associated equipment gas burners

RANGE STATEMENT	
	<ul style="list-style-type: none"> • instrumentation • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • process problems • equipment problems • quality problems • temperature and strain problems • equipment problems • quality problems • loss of utilities
Occupational health and safety (OHS)	<p>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</p>

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

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	
	<p>analyse potential situations requiring action and then in implementing appropriate corrective action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites or co-requisite units relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and 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	
	<ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for operating on-line stacking and assembly equipment.</p> <p>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>.</p> <p>This competency includes the operation of all ancillary equipment.</p> <p>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.</p>
--------------------------------	---

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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	
	<p>implementing appropriate corrective action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and 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	<p>Glass processing equipment applicable to on-line cutting, laminating, toughening or mirror formed glass for each specific area of glass products manufacture include:</p> <ul style="list-style-type: none"> • flat glass • laminated glass assembly equipment • automotive glass
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • 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 <p>It does NOT include processes involved with:</p> <ul style="list-style-type: none"> • melting furnaces used in glass production (primary source) • furnaces used in reheating (secondary source) • scientific glass equipment making
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for preparing reinforcement for use in a variety of manufactured concrete products.</p> <p>This unit includes:</p> <ul style="list-style-type: none">• 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. <p>This competency is typically performed by operators working either independently or as part of a work team.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
--------------------------------	---

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	
	<p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and</p>

RANGE STATEMENT	
regional contexts) may also be included.	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>This unit includes:</p> <ul style="list-style-type: none">• 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. <p>This competency is typically performed by operators working either independently or as part of a work team.</p>
--------------------------------	---

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	
	<p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	<p>All operations are performed in accordance with standard procedures and work instructions</p>
Surface finishes	<p>Surface finishes may include:</p> <ul style="list-style-type: none"> • fine wood float • rough wood float • hand steel float • broomed • helicopter steel float • raked finish

RANGE STATEMENT	
	<p>Surface finishes may be applied before or after veneering</p> <p>Surface finish after veneering may then also require further finish after curing</p>
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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)	<p>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</p>

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	<p>This unit of competency applies to operators who are responsible for casting complex concrete moulds for use in the production of concrete products.</p> <p>This unit includes:</p> <ul style="list-style-type: none">• 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. <p>This competency is typically performed by operators working either independently or as part of a work team.</p>
--------------------------------	--

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	
	<ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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: <ul style="list-style-type: none"> • pipes/tubing • hooks • cones
Typical problems	Typical problems may include: <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators in a concrete plant who are responsible for finishing manufactured concrete products after they have been cured.</p> <p>This unit includes, but is not restricted to:</p> <ul style="list-style-type: none">• all finishes applied to concrete after curing such as:<ul style="list-style-type: none">• 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. <p>This competency is typically performed by operators working either independently or as part of a work team.</p>
--------------------------------	---

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	
	<ul style="list-style-type: none"> • progress is continuously monitored and final finish is approached smoothly and confidently • finished surface is cleaned and sealed as required. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with 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	<p>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.</p> <p>This competency is typically performed by operators working either independently or as part of a work team.</p>
--------------------------------	--

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

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	<p>an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> 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	<p>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.</p> <p>This competency is typically performed by operators working either independently or as part of a work team.</p>
--------------------------------	---

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	<p>the batch preparation unit</p> <p>3.2.Ensure an adequate supply of material is available to meet production requirements</p> <p>3.3.Free form the concrete inside the work piece to meet the rough dimensions required by the specification</p> <p>3.4.Ensure that components, reinforcing and/or other fitments do not move during rough casting</p> <p>3.5.Employ safe working practices which conform to OHS and enterprise requirements</p>
4. Finish the work piece	<p>4.1.Prepare a finishing mixture for application to the work piece</p> <p>4.2.Apply the finishing coating, trowelling and sleeking the surface to specification</p> <p>4.3.Ensure the work piece cures according to procedures/work practices</p> <p>4.4.Remove any separators, non-permanent inserts, plugs or blinds</p> <p>4.5.Release work piece in accordance with safe working practice and procedures</p> <p>4.6.Return mould segments for reuse or storage in accordance with enterprise storage quality requirements</p>
5. Rectify routine problems	<p>5.1.Identify the range of faults that can occur during the operation</p> <p>5.2.Determine and rectify fault causes procedures/work instructions</p> <p>5.3.Identify and rectify equipment failure causes in accordance with procedures/work instructions</p> <p>5.4.Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions</p> <p>5.5.Identify non-routine problems and report to designated person</p>
6. Inspect and store products	<p>6.1.Inspect work piece for defects</p> <p>6.2.Make allowable repairs in accordance with specifications and procedures/work instructions</p> <p>6.3.Identify and mark work piece with appropriate brand or identification number</p> <p>6.4.Apply appropriate surface coatings or coverings as required by the specification</p> <p>6.5.Move work piece and store in compliance with</p>

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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for producing reinforced steel, cages and assemblies for insertion in concrete products.</p> <p>This unit of competency includes:</p> <ul style="list-style-type: none">• 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. <p>This competency is typically performed by an experienced operator working either independently or as part of a work team.</p>
--------------------------------	--

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
	<p>outside the mould)</p> <p>2.6. Report any non-compliance</p> <p>2.7. Follow all occupational health and safety (OHS) procedures and work instructions</p>
3. Rectify routine problems	<p>3.1. Identify the range of faults that can occur during the operation</p> <p>3.2. Determine and rectify fault causes in accordance with procedures/work instructions</p> <p>3.3. Identify and rectify equipment failure causes in accordance with procedures/work instructions</p> <p>3.4. Ensure appropriate records and log books of equipment operations are maintained to meet procedures/work instructions</p> <p>3.5. Identify non-routine problems and report to designated person</p>
4. Control hazards	<p>4.1. Identify hazards from the job to be done</p> <p>4.2. Identify other hazards in the work area</p> <p>4.3. Assess the risks arising from those hazards</p> <p>4.4. Implement measures to control those risks in line with procedures</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	
	<ul style="list-style-type: none"> • 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	<p>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.</p> <p>This unit of competency includes:</p> <ul style="list-style-type: none">• 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. <p>This competency is typically performed by operators working either independently or as part of a work team.</p>
--------------------------------	--

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	<p>gathering evidence of operating ability over a range of situations.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Typical accessories	<p>Typical accessories may include:</p> <ul style="list-style-type: none"> • hooks • pipes • rubber tubing
Typical veneering	<p>Typical veneering may include:</p> <ul style="list-style-type: none"> • screeding • floating • helicopter floating

RANGE STATEMENT	
	<ul style="list-style-type: none"> 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	<p>This unit of competency applies to operators who are responsible for removing a mould from a completed concrete product and preparing it for a new moulding operation.</p> <p>This unit of competency includes:</p> <ul style="list-style-type: none">• 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. <p>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.</p>
--------------------------------	---

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	
	<ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work</p>

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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></p> <p>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>).</p> <p>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.</p> <p>This competency is typically performed by operators working either independently or as part of a team.</p>
--------------------------------	--

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	<p>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:</p> <ul style="list-style-type: none"> • 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). <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation</p> <p>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.</p>
Method of assessment	<p>This unit may be assessed in conjunction with:</p> <ul style="list-style-type: none"> • PMC561080B Organise self • MSAPMSUP106A Work in a team. <p>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.</p>

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	
	<ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p> <p>Typically an operator would:</p> <ul style="list-style-type: none">• 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. <p>The operator generally works independently with frequent contact with the base plant.</p>
--------------------------------	---

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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

REQUIRED SKILLS AND KNOWLEDGE

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	<p>implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> 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. <p>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.</p>
Context of and specific resources for assessment	<p>Assessment for this unit of competency will be on an operating work site.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p> <p>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.</p>
Method of assessment	<p>It may be appropriate to assess this unit together with:</p> <ul style="list-style-type: none"> TLIC407D Drive heavy rigid vehicle TLIC307C Drive medium rigid vehicle TLIC507D Drive heavy combination vehicle <p>or such other unit as may be appropriate.</p> <p>This unit may be assessed in conjunction with:</p> <ul style="list-style-type: none"> MSAPMSUP280A Manage conflict at work PMC562081B Deliver customer service. <p>Individual enterprises may choose to add prerequisites</p>

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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions.
Special requirements	<p>Special requirements may be noted on the docket or instructed by the batcher or otherwise communicated.</p> <p>Special requirements may include the addition of water.</p>
Relevant person	Relevant person for reporting delays/breakdowns may include batcher, dispatcher or other person as specified in the procedures.
Records	<p>Completion of records must include:</p> <ul style="list-style-type: none"> the addition of water other items identified in the procedures <p>and where possible the customer signature.</p> <p>Records may be completed on the docket or other means as specified in the procedures.</p>
Checklists	<p>Required checklists may include:</p> <ul style="list-style-type: none"> maintenance checklists pre start checklists other checklists

RANGE STATEMENT	
Context	<p>This unit includes:</p> <ul style="list-style-type: none"> 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. <p>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.</p>
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> 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	<p>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.</p> <p>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.</p> <p>This competency is typically performed by operators working either independently or as part of a work team.</p>
--------------------------------	---

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	
	<p>requiring action and then in implementing appropriate corrective action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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). <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>This unit may be assessed in conjunction with:</p> <ul style="list-style-type: none"> • PMC561080A Organise self • MSAPMSUP106A Work in a team. <p>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.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and 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	<p>Aggregate may include:</p> <ul style="list-style-type: none"> the normal range of gravels and sand as well as recycled asphalt pavement (RAP) <p>It may, or may not, include the addition of special aggregates such as slag, carborundum, lime or crushed garnets</p>
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> 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	<p>This unit of competency applies to operators who are responsible for operating forming equipment within the manufactured mineral products industry.</p> <p>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.</p>
--------------------------------	---

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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	
	<ul style="list-style-type: none"> all OHS requirements are followed. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p> <p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	<p>All operations are performed in accordance with standard procedures and work instructions</p>

RANGE STATEMENT	
Operations	<p>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:</p> <ul style="list-style-type: none"> • fibre cement board • plaster board • machine cornices
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • 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)	<p>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</p>

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	<p>This unit of competency applies to operators who are responsible for operating wet and dry end equipment within the manufactured mineral products industry.</p> <p>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:</p> <ul style="list-style-type: none">• fibre cement board• plaster board• machine cornices <p>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.</p>
--------------------------------	---

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

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	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p> <p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p>
--------------------------------	---

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	
	<ul style="list-style-type: none"> • 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p> <p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and</p>

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: <ul style="list-style-type: none"> • mixers • moulds or formers • lifting equipment • cutting equipment • drying and other equipment integral to the manufacture of fibrous plasterboard
Fibre	Fibre may include: <ul style="list-style-type: none"> • glass fibre or other appropriate fibre
Typical problems	Typical problems may include: <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p> <p>This competency is performed by all operators working with tools and equipment and may be undertaken as part of working in a team environment.</p>
--------------------------------	--

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	<p>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:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>It may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with:</p>

EVIDENCE GUIDE	
	<ul style="list-style-type: none"> 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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Information	<p>Information to be used includes:</p> <ul style="list-style-type: none"> organisational requirements oral and written instructions manufacturer's technical information
Corrective action	<p>Corrective action to be taken includes:</p> <ul style="list-style-type: none"> correcting within your own authority reporting to the person in charge complying with company procedures
Work practices	<p>Work practices include:</p> <ul style="list-style-type: none"> 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	
	<ul style="list-style-type: none"> • 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	<p>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.</p> <p>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></p> <p>This unit of competency also includes the mixing and application of refractory mortars as part of the installation.</p> <p>This competency will typically be performed by a team of operators working under direction and to a specification and/or procedures.</p>
--------------------------------	--

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

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	
	<p>gathering evidence of operating ability over a range of situations.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Tools and equipment	<p>Tools and equipment include:</p> <ul style="list-style-type: none"> • mortar mixing equipment • trowels • lifting and placing equipment • equipment allowing access
Installation	<p>Installation includes:</p> <ul style="list-style-type: none"> • laying patterns (e.g. stretcher bond)

RANGE STATEMENT	
	<ul style="list-style-type: none"> • 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	<p>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.</p> <p>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>.</p> <p>This competency also includes the mixing and application of refractory mortars as part of the installation.</p> <p>This competency will typically be performed by a team of operators working under direction and to a specification and/or procedures.</p>
--------------------------------	---

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: <ul style="list-style-type: none"> • moulding tools • refractory mixing equipment • lifting and placing equipment • equipment allowing access
Installation	Installation includes: <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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>.</p> <p>This unit includes the mixing of castable refractory.</p> <p>This competency will typically be performed by a team of operators working under direction and to a specification and/or procedures.</p>
--------------------------------	--

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	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with other relevant units.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Tools and equipment	<p>Tools and equipment include:</p> <ul style="list-style-type: none"> • mixers • pumps • vibrators • lifting equipment • equipment allowing access
Installation	<p>Installation includes:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>Shotcrete work may be the total requirement for the job, or it may need to join to brick/block, moulded or cast refractory.</p> <p>This competency will typically be performed by a team of operators working under direction and to a specification and/or procedures.</p>
--------------------------------	---

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	
	<p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with other relevant units</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Shotcrete	<p>Shotcrete is the generic term used to describe the placement of cementitious products such as</p> <ul style="list-style-type: none"> concrete or refractory monolithics, by high volume and high velocity air
Tools and equipment	<p>Tools and equipment include:</p> <ul style="list-style-type: none"> mixing equipment air compressors

RANGE STATEMENT	
	<ul style="list-style-type: none"> • water addition equipment • gunning equipment/nozzles • equipment allowing access
Installation	<p>Installation includes:</p> <ul style="list-style-type: none"> • correct thickness of course • correct compaction • conforming to required curves and angles • tying to structure • keying to existing refractory
Occupational health and safety (OHS)	<p>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</p>

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	<p>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.</p> <p>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.</p>
--------------------------------	--

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	<p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p> <p>Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • appropriate attachment of the ceramic fibre is ensured • jointing is correct.
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with other relevant units.</p>
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. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and 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	<p>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.</p> <p>The unit includes setting up and tuning equipment for startup, job change and equipment changes in preparation for production.</p> <p>This unit assumes that the person doing the set up has the knowledge and skills to operate the process being set up.</p> <p>This competency is typically performed by an experienced operator, leading hand or supervisor.</p> <p>It does NOT include setting up and tuning processes covered by:</p> <ul style="list-style-type: none">• <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-instalment 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	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this competency unit.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Manufactured mineral products	<p>Manufactured mineral products may include:</p> <ul style="list-style-type: none"> • clay and ceramics • concrete • concrete products • ceramic crucibles • cement • fibre cement • plasterboard • ground minerals • other manufactured mineral products processes
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • changeover parts and equipment • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Plant data	<p>Plant data may include:</p> <ul style="list-style-type: none"> • test results

RANGE STATEMENT	
	<ul style="list-style-type: none"> • 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:	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>This unit of competency applies to operators who are responsible for preparing and processing raw meal into cement and/or lime product.</p> <p>This unit does NOT require the operation of a central control panel.</p> <p>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.</p>
--------------------------------	--

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
	<p>instrument/ control panels for variations, fluctuations or trends</p> <p>2.3. Maximise throughput of system while meeting quality target parameters</p> <p>2.4. Check and adjust ancillary equipment as required</p>
3. Distribute product to storage	<p>3.1. Monitor and perform necessary adjustments to discharge rate and temperature as required</p> <p>3.2. Monitor the distribution transport system for efficiency and spillages and take appropriate action as required</p> <p>3.3. Monitor the distribution of product to the correct storage area and level of product in that area, and redirect as required</p>
4. Respond to problems	<p>4.1. Identify possible routine and non-routine problems in the equipment or process</p> <p>4.2. Determine problems needing action</p> <p>4.3. Determine possible fault causes</p> <p>4.4. Rectify problem using appropriate solution within area of responsibility</p> <p>4.5. Follow through items initiated until final resolution has occurred</p> <p>4.6. Report problems outside area of responsibility to designated person</p>
5. Shut down equipment	<p>5.1. Ensure line is clear of all product and left ready for startup</p> <p>5.2. Shut down equipment in accordance with procedures</p> <p>5.3. Complete appropriate records and logs</p> <p>5.4. Shut down equipment in an emergency situation</p>
6. Prepare equipment for maintenance	<p>6.1. Isolate equipment in accordance with procedures</p> <p>6.2. Remove any broken materials safely</p> <p>6.3. Ensure area is clear and safe for maintenance</p>
7. Control hazards	<p>7.1. Identify hazards in kiln work area</p> <p>7.2. Assess the risks arising from those hazards</p> <p>7.3. Implement measures to control those risks in line with procedures and duty of care</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • temperatures are maintained within limits • quality is monitored to minimise wastage • process measurements are continually made or observed. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
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 <ul style="list-style-type: none"> • 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	<p>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.</p> <p>This unit of competency covers the making of moulds, models and dies for use in a variety of manufacturing operations, such as:</p> <ul style="list-style-type: none">• concrete products• clay products• ceramic products <p>This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic work.</p>
--------------------------------	---

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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Materials	<p>Materials may include:</p> <ul style="list-style-type: none"> • 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	<p>4.1. Monitor operation and compare with procedures for appropriate operation</p> <p>4.2. Identify any deviation from standard performance</p> <p>4.3. Identify the cause of the deviation and take action</p> <p>4.4. Make adjustments to the equipment settings, process conditions or raw materials to bring production into specification</p> <p>4.5. Continue monitoring operation and making adjustments until product/equipment is within specification</p>
5. Respond to problems	<p>5.1. Identify possible routine and non-routine problems in the equipment or process</p> <p>5.2. Determine problems needing action</p> <p>5.3. Determine possible fault causes</p> <p>5.4. Rectify problem using appropriate solution within area of responsibility</p> <p>5.5. Report problems outside area of responsibility to designated person</p>
6. Control hazards	<p>6.1. Identify hazards from the job to be done</p> <p>6.2. Identify other hazards in the work area</p> <p>6.3. Assess the risks arising from those hazards</p> <p>6.4. Implement measures to control those risks in line with procedures</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	
	<p>within timeframe</p> <ul style="list-style-type: none"> • 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. <p>The assessment activities should include responding to a range of problems.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	<p>This unit includes equipment for application of glazes to ceramic or clay products, including:</p> <ul style="list-style-type: none"> • automatic spray lines • robotic spray equipment • automatic dipping lines • PLCs, but not control panels
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • changeover parts and equipment • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Process	<p>Process includes:</p> <ul style="list-style-type: none"> • setting up and tuning equipment for startup, job change and equipment changes in preparation for production
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>Plant data may include:</p> <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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>.</p> <p>Typically an operator would:</p> <ul style="list-style-type: none">• 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. <p>This competency is typically performed by operators</p>
--------------------------------	---

	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

	<p>rather than on recovery from a disaster.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication</p>

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: <ul style="list-style-type: none"> • alignment of all equipment • checks and adjustments according to product specifications and procedures • production schedule requirements
Monitoring	Monitoring includes analysing and interpreting data for: <ul style="list-style-type: none"> • variations • fluctuations • trends with a view to establishing stable, efficient operation producing goods as required
Process data	Process data include that from:

RANGE STATEMENT	
	<ul style="list-style-type: none"> • equipment • instruments • control panels • test results
Appropriate action	<p>Appropriate action includes adjusting:</p> <ul style="list-style-type: none"> • temperature controls • equipments settings • process conditions <p>to ensure process parameters are maintained to job specifications</p>
Records	<p>Records may be in:</p> <ul style="list-style-type: none"> • hard copy • electronic form
Application of equipment:	<p>This unit includes equipment applicable to forming glass in each of the specific areas of glass products manufacture:</p> <ul style="list-style-type: none"> • flat glass • insulation, glass wool insulation, laminated blankets, roll and boards • fibreglass and glass filaments • packaging, bottles and jars
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • forming and associated equipment such as: <ul style="list-style-type: none"> • bushings • finshields • applicators • shoe and winder assemblies • spinners • lapping equipment • process water • lehr • furnace • forehearth • bath • fiberisers • computers • measuring and recording equipment

RANGE STATEMENT	
	<ul style="list-style-type: none"> • communication equipment • hand tools • safety clothing and equipment
Process	<p>The process includes:</p> <ul style="list-style-type: none"> • setting up, monitoring and tuning equipment for optimum performance especially during startup, job change and equipment changes
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • raw materials supply • equipment alignment • analysis of all plant data • control of temperature within specification • product quality • equipment speed • taking corrective action
Plant data	<p>Plant data may include:</p> <ul style="list-style-type: none"> • 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)	<p>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</p>

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	<p>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.</p> <p>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>.</p> <p>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.</p>
--------------------------------	--

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

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

	<p>emphasis should be on the ability to stay out of trouble than on recovery from a disaster.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p>

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: <ul style="list-style-type: none"> melting furnaces used in glass production (primary source) scientific glass
Typical problems	Typical problems may include: <ul style="list-style-type: none"> 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	<p>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.</p> <p>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>.</p> <p>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.</p>
--------------------------------	---

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

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	
	<p>attention or potential problems are recognised and dealt with in a timely manner</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p> <p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and 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	<p>This unit includes equipment applicable to each of the specific areas of glass products manufacture:</p> <ul style="list-style-type: none"> • flat glass • insulation, glass wool insulation, laminated blankets, roll and boards • fibreglass and glass filaments • packaging, bottles and jars
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • secondary process/finishing and associated equipment such as: <ul style="list-style-type: none"> • 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	<p>The process includes:</p> <ul style="list-style-type: none"> • setting up, monitoring and tuning equipment for optimum performance especially during startup, job change and equipment changes

RANGE STATEMENT	
	<p>It does NOT include processes involved with:</p> <ul style="list-style-type: none"> • scientific glass manufacture • primary manufacturing processes
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • raw materials supply • equipment alignment • analysis of all plant data • product quality • equipment problems
Plant data	<p>Plant data may include:</p> <ul style="list-style-type: none"> • 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)	<p>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</p>

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	<p>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.</p> <p>This unit of competency includes:</p> <ul style="list-style-type: none">• 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). <p>This competency is typically performed by an experienced operator, leading hand or supervisor working under the supervision of a principal contractor and architect.</p>
--------------------------------	---

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	
	<p>situations.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p> <p>Prerequisite units may be co-assessed if appropriate.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	<p>All operations are performed in accordance with standard procedures and work instructions</p>
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>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).</p> <p>This unit of competency includes:</p> <ul style="list-style-type: none">• 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
--------------------------------	---

	<ul style="list-style-type: none"> welding. <p>This competency is typically performed by an experienced operator, leading hand or supervisor, and would generally involve engineer consultation.</p>
--	---

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

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	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • products are made consistently in minimum time and with minimum patching • finishing is within specification/example • good OHS practice is used consistently. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	<p>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.</p> <p>This competency is typically performed by an experienced modeler, leading hand or supervisor.</p>
--------------------------------	---

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	
	<ul style="list-style-type: none"> • jigs and fixtures • personal safety equipment • mixing equipment • models • weighing equipment
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • personal injuries • complexities of mould design and shape • lack of appropriate illumination
Occupational health and safety (OHS)	<p>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</p>

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	<p>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.</p> <p>This competency is generally performed by an experienced modeller or a trainee modeller under supervision.</p>
--------------------------------	---

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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Products	<p>Products may include:</p> <ul style="list-style-type: none"> • ornamental castings including scotias, cornices and arches • centre pieces (both reinforced and un-reinforced) • ornamental recessed panels
Equipment and unit operations	<p>This unit of competency includes all such items of equipment and unit operations which form part of the modelling process. These may include:</p> <ul style="list-style-type: none"> • slides • templates • reinforcing materials • separation agents • lifting equipment (for large work)
Fibre	Fibre may be glass fibre or other appropriate fibre
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • incorrect calculations or setting out • inappropriate plaster mixtures • variations in ambient temperature

RANGE STATEMENT	
	<ul style="list-style-type: none"> 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	<p>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.</p> <p>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.</p>
--------------------------------	---

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
	<p>required for the production schedule</p> <p>2.4.Ensure that the equipment is in a safe condition for use</p>
3. Monitor, interpret data and adjust operation	<p>3.1.Monitor instruments and control panels, and interpret test results for fluctuations, variations and trends</p> <p>3.2.Monitor plant and process and deduce conditions of materials in process and products being made</p> <p>3.3.Determine appropriate action to improve process operation</p> <p>3.4.Adjust controls to ensure product parameters are maintained to job specifications</p> <p>3.5.Check that process operation has improved</p> <p>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</p>
4. Sample, test and record product data	<p>4.1.Carry out sampling procedures appropriate to the product and the test in line with enterprise requirements</p> <p>4.2.Complete appropriate test to enterprise and client requirements</p> <p>4.3.Measure/graph and record operating parameters, according to enterprise requirements</p> <p>4.4.Record test results in hard or electronic form as required by standard procedures and work instructions</p>
5. Rectify equipment and quality problems	<p>5.1.Identify the range of equipment and quality faults that can occur during the operation</p> <p>5.2.Determine and rectify equipment and quality fault causes in accordance with established enterprise procedures</p> <p>5.3.Identify and rectify equipment failure causes in accordance with established enterprise procedures</p> <p>5.4.Make sure appropriate records and log books of equipment operations are maintained to meet enterprise requirements</p> <p>5.5.Identify non-routine problems and rectify within area of responsibility</p> <p>5.6.Report problems outside area of responsibility to designated person</p>
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	<p>gathering evidence of operating ability over a range of situations.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p> <p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	<p>All operations are performed in accordance with standard procedures and work instructions</p>
Equipment	<p>This competency unit includes equipment applicable to finishing flat sheet product such as:</p> <ul style="list-style-type: none"> • sanding • sealing • priming

RANGE STATEMENT	
	<ul style="list-style-type: none"> • rebating
Tools and equipment	<p>Tools and equipment may include:</p> <ul style="list-style-type: none"> • finishing and associated equipment • computers • measuring and recording equipment • communication equipment • hand tools • safety clothing and equipment
Process	<p>The process includes:</p> <ul style="list-style-type: none"> • setting up, monitoring and tuning equipment for optimum performance especially during startup, job change and equipment changes
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • raw materials supply • equipment alignment • analysis of all plant data • product quality • equipment problems
Plant data	<p>Plant data may include:</p> <ul style="list-style-type: none"> • 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)	<p>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</p>

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	<p>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.</p> <p>This unit of competency covers the making of moulds, models and dies for use in a variety of manufacturing operations, such as:</p> <ul style="list-style-type: none">• concrete products• clay products• ceramic products <p>This unit was developed for larger production contexts but it may also be relevant to craft practitioners producing ceramic work.</p> <p>This competency is typically performed by an experienced technician, leading hand or supervisor.</p>
--------------------------------	---

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	<p>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:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>This unit has no prerequisite competencies.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
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	<p>Materials may include:</p> <ul style="list-style-type: none"> • additives • body materials • epoxy resins • metal strapping • plaster • plastic • release agents • rubber • slip • timber • water
Equipment	<p>Equipment may include:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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</p> <p>This will typically be done by an individual technician working in liaison with customers, installers and technical experts.</p>
--------------------------------	---

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
	<p>strength</p> <p>2.4. Identify hazards of materials and processes to be used and apply hierarchy of control to control hazards</p> <p>2.5. Determine expansion which will occur for this material</p> <p>2.6. Adjust material/mix to be suitable for temperatures</p>
3. Undertake thermal design	<p>3.1. Determine heat flow through the refractory</p> <p>3.2. Determine interface temperatures for multi-component linings</p> <p>3.3. Use simple software</p> <p>3.4. Determine interface bonding/anchor issues</p>
4. Specify refractory design	<p>4.1. Specify materials to be used</p> <p>4.2. Specify installation method to be used</p> <p>4.3. Confirm specification meets customer needs and installer requirements</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<p>It may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with other relevant units.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Refractory materials	<p>Refractory materials are those materials that have a resistance to temperature and include:</p> <ul style="list-style-type: none"> • alumina silicate materials (clay) • silliminities • bauxite • synthetic aggregates • silica • magnesite • dolomite • chrome ores
Refractory installation techniques	<p>Refractory installation techniques include:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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</p> <p>This unit would typically be undertaken by a technician working either alone or in liaison with another refractory expert.</p>
--------------------------------	---

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	
	<p>action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>It may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with other relevant units.</p> <p>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.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work</p>

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Investigation	Investigation involves: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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	<p>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>.</p> <p>It involves calculating the theoretical performance components, gathering data, calculating performance and making recommendations based on verification results.</p>
------------------------	--

Application of the Unit

Application of the unit	<p>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.</p> <p>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.</p> <p>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.</p> <p>This competency is typically performed by a senior technician who will take the lead in the data gathering phase and then analyse the data.</p>
--------------------------------	--

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	
	<p>action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>It may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with other relevant units.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised</p>

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	<p>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.</p> <p>This competency applies to all work environments and sectors within the industry.</p> <p>This competency is typically performed by technicians developing new products or applying this knowledge to advanced process/product problem solving.</p>
--------------------------------	--

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	<p>Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • knowledge of material properties to the selection of appropriate materials to an application is applied.
Context of and specific resources for assessment	<p>Competence in this unit may be assessed:</p> <ul style="list-style-type: none"> • 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. <p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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

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. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and 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 <ul style="list-style-type: none"> 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	<p>This unit of competency applies to senior technicians/technologists who are designing, or part of a team designing, structures or structural or mechanical components.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
--------------------------------	---

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
	<p>processes, and complete all reports</p> <p>5.8. Ensure project records are complete and all required reports have been completed and submitted</p> <p>5.9. Archive records according to company procedures</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<p>This unit of competency assumes the knowledge component included in the following unit of competency:</p> <ul style="list-style-type: none"> • <i>PMC555031B Choose materials for an application</i> <p>Competence in this unit may be assessed:</p> <ul style="list-style-type: none"> • 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. <p>Evidence must be available that the specified knowledge has been acquired and is able to be applied or the units may be co-assessed:</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Standard procedures	<p>Standard procedures refer to:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>Trialling may refer to:</p> <ul style="list-style-type: none">• 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. <p>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</p>
--------------------------------	--

	<p>technical experts and stakeholders and coordinating the work of people at all levels in order to complete the trial.</p> <p>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.</p>
--	--

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	<p>1.1. Analyse documentation available on trial</p> <p>1.2. Consult with trial proponent and other stakeholders</p> <p>1.3. Define purposes of trial</p>

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	
	<ul style="list-style-type: none"> • Assessment may be applied under project related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Assessment may be in conjunction with assessment of other units of competency where required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Documentation	<p>Documentation available may include:</p> <ul style="list-style-type: none"> • plant/process/equipment drawings/schematics • technical specifications • sales/promotional information • technical papers • notes/minutes from meetings/discussions • emails
Purpose of the trial	<p>Purpose of the trial may include:</p> <ul style="list-style-type: none"> • evaluation of new • examination of existing • specific improvements aimed at: <ul style="list-style-type: none"> • better sustainability outcomes • better technical outcomes • greater reliability • greater efficiency • cheaper costs

RANGE STATEMENT	
Promulgate	<p>Promulgation of information includes:</p> <ul style="list-style-type: none"> • providing the right information to the right person in the right format in a timely fashion
HSE and other risks	<p>HSE and other risks include:</p> <ul style="list-style-type: none"> • health and safety risks • sustainability risks • regulatory risks • business risks
Capability	<p>Capability for data manipulation includes:</p> <ul style="list-style-type: none"> • required hardware • required software • required competence of the workforce
Procedures	<p>Procedures may be written, verbal, computer-based or in some other form. They include:</p> <ul style="list-style-type: none"> • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant <p>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</p>
Resources	<p>Resources required for trial include:</p> <ul style="list-style-type: none"> • materials • plant and equipment • required utilities • waste disposal/emission control and similar • time allocation • personnel • competencies of personnel • space
Appropriate action	<p>Appropriate action may include:</p> <ul style="list-style-type: none"> • immediately ceasing the trial

RANGE STATEMENT	
	<ul style="list-style-type: none"> • modifying the trial and proceeding • continuing the trial with modified monitoring/data collection • no change
Trial results	<p>Trial results may include a recommendation:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p> <p>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.</p>
--------------------------------	--

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	<ul style="list-style-type: none"> • 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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Stakeholders	<p>Stakeholders may include:</p> <ul style="list-style-type: none"> • customer representatives • technical experts • regulators • refractory designer

RANGE STATEMENT	
	<ul style="list-style-type: none"> refractory installer
End use conditions	<p>End use conditions may include:</p> <ul style="list-style-type: none"> 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	<p>Ranking should be based on:</p> <ul style="list-style-type: none"> how well they meet the technical requirements of the end use
HSE risks	<p>HSE risks should include focus on the comparative health, safety and environmental risks of the materials under consideration.</p> <p>Risks would include risks during:</p> <ul style="list-style-type: none"> installation use repair removal and disposal at end of life
Cost of materials	<p>Cost of materials should be total costs and should include:</p> <ul style="list-style-type: none"> raw material costs installation costs life cycle costs
Combination of materials	<p>The term 'combination of materials' is used in this unit to mean any or all of:</p> <ul style="list-style-type: none"> mixing of more than one refractory material use of refractory materials in series use of refractory materials in parallel
Optimum materials	<p>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</p>

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	<p>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.</p> <p>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.</p> <p>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.</p>
--------------------------------	---

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	<p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<ul style="list-style-type: none"> • 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	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

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: <ul style="list-style-type: none"> • customer representatives • technical experts • regulators • refractory designer • refractory installer
End use conditions	End use conditions may include: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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	
	<ul style="list-style-type: none"> • material costs • installation costs • repair costs • life cycle costs
Optimum refractory system	<p>The optimum refractory system would be:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p> <p>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.</p>
--------------------------------	---

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
	<p>2.3. Make a preliminary selection of tests which will provide required data</p> <p>2.4. Identify health, safety and environment (HSE) risks of possible tests</p> <p>2.5. Estimate the cost of possible tests</p> <p>2.6. Confirm test data will yield information required by stakeholders</p> <p>2.7. Specify preferred range of tests and test methods to provide required data</p>
3. Specify sampling regime	<p>3.1. Identify sample requirements of specified tests</p> <p>3.2. Determine sampling frequency required to meet information requirements</p> <p>3.3. Draft sampling regime</p> <p>3.4. Liaise with relevant stakeholders in relation to sampling regime</p> <p>3.5. Negotiate changes to sampling regime and/or information requirements as required.</p> <p>3.6. Finalise testing and sampling regime</p>
4. Interpret test data	<p>4.1. Inspect test data for anomalies or discrepancies and take required action</p> <p>4.2. Determine required information from test data</p> <p>4.3. Analyse information as required</p> <p>4.4. File and report information as required</p> <p>4.5. Take appropriate action based on information</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<ul style="list-style-type: none"> 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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Relevant documents	<p>Relevant documents may include:</p> <ul style="list-style-type: none"> specifications contracts

RANGE STATEMENT	
	<ul style="list-style-type: none"> • designs • design briefs • information about refractory failures • other communications from stakeholders
Stakeholders	<p>Stakeholders may include:</p> <ul style="list-style-type: none"> • customer representatives • technical experts • regulators • refractory designer • refractory installer
End use conditions	<p>End use conditions may include:</p> <ul style="list-style-type: none"> • 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	<p>Tests to include:</p> <ul style="list-style-type: none"> • compression • modulus of rupture • thermal conductivity • density • porosity/permeability • abrasion • thermal expansion • refractoriness
Test methods	<p>Test methods include:</p> <ul style="list-style-type: none"> • Standards Australia (SAA) • International Organisation for Standardisation (ISO) • ASTM International • Joint Support Office (JSO)/Deutsches Institut für Normung (DIN)
Preliminary selection of tests	<p>Preliminary selection should be based on:</p> <ul style="list-style-type: none"> • how well they meet the technical requirements
HSE risks	<p>HSE risks should include focus on the comparative health, safety and environmental risks of the tests</p>

RANGE STATEMENT	
	<p>under consideration.</p> <p>Risks would include risks during:</p> <ul style="list-style-type: none"> • sampling • testing equipment and conditions • sample retention of required test • disposal of discarded sample and test piece
Cost of test	<p>Cost of materials should be total costs and should include:</p> <ul style="list-style-type: none"> • cost of sample • cost of sampling • capital and recurrent cost of test • cost of data interpretation
Preferred range of tests and test methods	<p>The preferred range of tests and test methods would be:</p> <ul style="list-style-type: none"> • those tests which best deliver the technical requirement at the lowest cost and the least HSE risk
Determining information and analysing information	<p>Determining information and analysing information may require:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p> <p>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.</p>
--------------------------------	--

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	<p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<ul style="list-style-type: none"> • 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	
	<ul style="list-style-type: none"> removal and disposal at end of life
Cost of refractory component	<p>Cost of refractory components should be total costs and should include:</p> <ul style="list-style-type: none"> material costs manufacturing cost installation costs repair costs life cycle costs
Optimum refractory component design	<p>The optimum refractory component design would be:</p> <ul style="list-style-type: none"> 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	<p>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.</p> <p>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.</p> <p>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.</p>
--------------------------------	--

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
<ul style="list-style-type: none"> • negotiating • technical reporting
Required knowledge
<p>Required knowledge includes:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • spalling • corrosion • abrasion • impact/compression/tension • thermal shock

Evidence Guide

EVIDENCE GUIDE	
<p>The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
Overview of assessment	<p>Assessment of this unit should include demonstrated competence in a workplace based project or a simulated workplace project.</p> <p>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.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Competence must be demonstrated in the ability to select an appropriate material and write the required specification.</p>
Context of and specific resources for assessment	<p>Assessment may occur on the job or in an appropriately simulated environment. Access is required to real or appropriately simulated situations, including work areas,</p>

EVIDENCE GUIDE	
	<p>materials and equipment, and to information on workplace practices and OHS practices.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<ul style="list-style-type: none"> • 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	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work</p>

RANGE STATEMENT	
situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Stakeholders	Stakeholders may include: <ul style="list-style-type: none"> • customer representatives • technical experts • regulators • refractory designer • refractory installer
Purpose of investigation	The purpose of the investigation may include: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • technical investigation - all relevant technical

RANGE STATEMENT	
	<p>personnel</p> <ul style="list-style-type: none"> 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	<p>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:</p> <ul style="list-style-type: none"> • castable • mouldable and • gunned (shotcrete, gunitite). <p>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>.</p> <p>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.</p>
--------------------------------	--

	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	<p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> • casting • moulding of plastic refractory • gunning (shotcrete, gunite and gunned plastic refractory)
Refractory materials	Refractory materials may include one or more of: <ul style="list-style-type: none"> • cementitious refractories • plastic clay refractories • other refractories • fibre or fibre reinforced refractories such as: <ul style="list-style-type: none"> • ceramic fibre • steel fibre
Mix requirements	Mix requirements includes: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • vibrators • compactors • rams • gunning systems
Anchors	Types of anchors may include:

RANGE STATEMENT	
	<ul style="list-style-type: none"> • metal crook • metal Y • cast iron • ceramic • precast cones • hexmetal
Post placement requirements	<p>Post placement requirements may include:</p> <ul style="list-style-type: none"> • drying • curing • control of moisture and or temperature • striking of formwork • removal of scaffolding or other access/egress provisions
HSE hazards	<p>HSE hazards may include:</p> <ul style="list-style-type: none"> • 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	<p>Appropriate hazard control should be determined by:</p> <ul style="list-style-type: none"> • applying the hierarchy of control
Stakeholders	<p>Stakeholders may include:</p> <ul style="list-style-type: none"> • customer representatives • technical experts • regulators • refractory designer • materials and equipment suppliers • contractors
Requirements	<p>Requirements include:</p> <ul style="list-style-type: none"> • materials • equipment • contractors

RANGE STATEMENT	
Time critical items	<p>Time critical items are those items which if not completed on time will cause the project to run overtime and may be determined from:</p> <ul style="list-style-type: none"> critical path analysis long lead time items other techniques
Installation specification	<p>Installation specification should include:</p> <ul style="list-style-type: none"> technical specification hazard controls and residual hazards installation schedule measures monitoring critical items
End of project documentation	<p>End of project documentation may include:</p> <ul style="list-style-type: none"> operating and/or maintenance procedures technical specification routine monitoring requirements project review report: <ul style="list-style-type: none"> 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	<p>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:</p> <ul style="list-style-type: none">• block• brick• precast. <p>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>.</p> <p>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.</p>
--------------------------------	---

	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	<p>Assessment of this unit should include demonstrated competence in a workplace based project or a simulated workplace project.</p> <p>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.</p>
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	<p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<ul style="list-style-type: none"> • 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	
	<p>to other circumstances.</p> <ul style="list-style-type: none"> 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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Refractory materials	<p>Refractory materials may include one or more of:</p> <ul style="list-style-type: none"> cementitious refractories clay refractories other refractories
Bond forms	<p>Bond forms include:</p> <ul style="list-style-type: none"> stretcher bond header bond English bond English garden wall bond reverse bond broken bond
Junctions and piers	<p>Junctions include:</p> <ul style="list-style-type: none"> tie brick special brick squint brick <p>Piers may be:</p> <ul style="list-style-type: none"> attached detached not needed <p>Note: feather edge refractory bricks are not</p>

RANGE STATEMENT	
	normally included
Mortar	<p>Mortar includes:</p> <ul style="list-style-type: none"> • hydraulic setting dry mixes • air setting dry mixes • heat setting dry mixes <p>and may be:</p> <ul style="list-style-type: none"> • clay • fireclay • chamotte • mortar
Installation equipment	<p>Installation equipment may include one or more of:</p> <ul style="list-style-type: none"> • equipment for lifting and placing precast blocks • temporary support for roofs and arches • spreader jacks
Anchors	<p>Types of anchors may include:</p> <ul style="list-style-type: none"> • anchor bolts • anchor mesh • retention clips
Post laying requirements	<p>Post laying requirements may include:</p> <ul style="list-style-type: none"> • drying • control of moisture and or temperature • removal of scaffolding or other access/egress provisions
HSE hazards	<p>HSE hazards may include:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • applying the hierarchy of control
Stakeholders	Stakeholders may include: <ul style="list-style-type: none"> • customer representatives • technical experts • regulators • refractory designer • materials and equipment suppliers • contractors
Requirements	Requirements include: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • critical path analysis • long lead time items • other techniques
Installation specification	Installation specification should include: <ul style="list-style-type: none"> • technical specification • hazard controls and residual hazards • installation schedule • measures monitoring critical items
End of project documentation	End of project documentation may include: <ul style="list-style-type: none"> • operating and/or maintenance procedures • technical specification • routine monitoring requirements • project review report: <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p> <p>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.</p>
--------------------------------	--

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	<p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<ul style="list-style-type: none"> 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	
	<ul style="list-style-type: none"> • spreader jacks
Anchors and keys	<p>Types of anchors may include:</p> <ul style="list-style-type: none"> • anchor bolts • through anchors • retention clips <p>Keys include cut mechanical keys</p> <p>Adhesion may include:</p> <ul style="list-style-type: none"> • chemical and other means of ensuring a bond between the repair and the refractory substrate
Post repair requirements	<p>Post repair requirements may include:</p> <ul style="list-style-type: none"> • drying • curing • control of moisture and/or temperature • striking of formwork • removal of scaffolding or other access/egress provisions
HSE hazards	<p>HSE hazards may include:</p> <ul style="list-style-type: none"> • 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	<p>Appropriate hazard control should be determined by:</p> <ul style="list-style-type: none"> • applying the hierarchy of control
Stakeholders	<p>Stakeholders may include:</p> <ul style="list-style-type: none"> • customer representatives • technical experts • regulators • refractory designer • materials and equipment suppliers • contractors

RANGE STATEMENT	
Requirements	Requirements include: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • critical path analysis • long lead time items • other techniques
Repair specification	Repair specification should include: <ul style="list-style-type: none"> • technical specification • hazard controls and residual hazards • installation schedule • measures monitoring critical items
End of project documentation	End of project documentation may include: <ul style="list-style-type: none"> • operating and/or maintenance procedures • technical specification • routine monitoring requirements • project review report: <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p> <p>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.</p>
--------------------------------	--

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	
	<p>workplace project.</p> <p>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.</p>
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	<p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
Method of assessment	<ul style="list-style-type: none"> • 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

	<ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p> <p>The storage will probably be on or adjacent to the plant or equipment which is about to use the materials.</p>
--------------------------------	--

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	<p>It would be desirable to assess this unit concurrently with MSAC112003A Undertake manual handling unless competency has already been achieved in this unit.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	<p>All operations are performed in accordance with standard procedures and work instructions</p>
Equipment and storage facilities	<p>Equipment and storage facilities may include:</p> <ul style="list-style-type: none"> • 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	<p>Materials may include:</p> <ul style="list-style-type: none"> • materials supplied from an external source • materials/chemical mix produced internally for secondary process

RANGE STATEMENT	
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • material specifications • contamination of stored stock • quality of received materials • equipment failure
OHS	<p>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</p>

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	<p>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.</p> <p>This unit of competency depends upon the application of:</p> <ul style="list-style-type: none">• 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	
	<ul style="list-style-type: none"> assistance is sought from relevant personnel when difficulties arise.
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Information sources and documentation	<p>This unit may vary according to the enterprise's use of the following information sources and documentation:</p> <ul style="list-style-type: none"> procedures and work instructions

RANGE STATEMENT	
	<ul style="list-style-type: none"> • materials safety data sheets (MSDS) • job cards • maintenance logs • plant drawings
Typical problems include:	Typical problems may include: <ul style="list-style-type: none"> • 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	<p>This unit of competency is typically performed by an experienced operator working either independently or as part of a work team.</p> <p>It will be necessary to have the licence required by government regulation where the type of load shifting equipment is regulated.</p> <p>This unit has the prerequisite competency of any licence required by government regulation.</p> <p>This unit includes:</p> <ul style="list-style-type: none">• 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. <p>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.</p>
--------------------------------	--

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
	<p>site/non-site personnel</p> <p>2.3. Erect signs and barricades, appropriate to the task, to conform with enterprise safety requirements</p> <p>2.4. Select for the specific task appropriate personal protective equipment (PPE) in accordance with standard operating procedures</p> <p>2.5. Inspect work area to determine appropriate path for the movement of vehicular traffic</p> <p>2.6. Ensure work permits are issued and received by authorised personnel as/when required in accordance with standard operating procedures</p> <p>2.7. Confirm job requirements and expectations with relevant personnel</p> <p>2.8. Clarify non-standard requirements</p> <p>2.9. Accurately identify materials to be moved</p> <p>2.10. Identify and clarify material movements required</p>
3. Shift loads	<p>3.1. Accurately assess weight of load by specified methods to ensure compliance with equipment load plate specifications</p> <p>3.2. Use the appropriate process/equipment to shift loads</p> <p>3.3. Observe all regulatory (state governing body) requirements regarding shifting loads</p> <p>3.4. Smoothly and consistently move controls and vehicle/equipment within safe operating practices/limits</p> <p>3.5. Use standard communication signals to coordinate safe movement of load</p> <p>3.6. Stack loads to enterprise specific requirements, ensuring the stability of the stack without creating a hazard to personnel and equipment</p> <p>3.7. Use appropriate equipment attachments to perform tasks according to standard enterprise procedures</p> <p>3.8. Effectively perform emergency evasive action should the need arise</p>
4. Close down plant/equipment	<p>4.1. Close down plant/equipment in accordance with standard operating procedures</p> <p>4.2. Park/store and secure plant/equipment to conform with enterprise specific requirements</p> <p>4.3. Perform post-operational checks in strict accordance with manufacturer's requirements and standard</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>operating procedures</p> <p>4.4.Clean down plant/equipment and dispose of waste following established procedures</p> <p>4.5.Complete all record keeping/logs/paperwork as required</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	<p>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.</p> <p>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.</p>
--------------------------------	---

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
	<p>operation</p> <p>3.2. Determine and rectify fault causes in accordance with established enterprise procedures</p> <p>3.3. Identify and rectify equipment failure causes in accordance with established enterprise procedures</p> <p>3.4. Make sure appropriate records and log books of equipment operations are maintained to meet enterprise requirements</p> <p>3.5. Identify non-routine problems and report according to procedure</p>
4. Carry out maintenance procedures	<p>4.1. Recognise a maintenance need according to procedure</p> <p>4.2. Isolate materials handling equipment and prepare for maintenance/vessel entry as required</p> <p>4.3. Complete minor maintenance according to procedures</p> <p>4.4. Receive plant back from maintenance and check for safe operation</p> <p>4.5. Prepare plant for the introduction of materials and for operation</p>
5. Control hazards	<p>5.1. Identify hazards in the material handling work area</p> <p>5.2. Assess the risks arising from those hazards</p> <p>5.3. Implement measures to control those risks in line with procedures</p> <p>5.4. Shut down in an emergency as required</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	
	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>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.</p> <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and 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	
	<p>Particulate solid properties include:</p> <ul style="list-style-type: none"> 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	<p>Typical problems may include:</p> <ul style="list-style-type: none"> 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	<p>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).</p> <p>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.</p>
--------------------------------	--

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	<p>1.1.Prepare and assemble, in accordance with specified requirements, materials used for the replacement of refractory</p> <p>1.2.Prepare and assemble appropriate plant and equipment in accordance with specific needs and manufacturer's operating instructions</p> <p>1.3.Notify appropriate personnel and ensure that required permits have been obtained</p>
2. Replace refractory	<p>2.1.Ensure that the removal of refractory and brickwork is performed in accordance with standard procedures/work instructions</p> <p>2.2.Ensure that brickwork/refractory is replaced following standard procedures and work instructions</p> <p>2.3.Ensure that waste from repairs to kiln is removed and disposed of correctly</p>

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	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • replacement follows standard procedures • correct materials are used • permit and other health and safety procedures are followed. <p>Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.</p>
Context of and specific resources for assessment	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Equipment	<p>Equipment may include:</p> <ul style="list-style-type: none"> • protective clothing, hearing protection, safety glasses and adequate ventilation • hand and power tools • mobile plant • refractory support mechanisms
Variations	<p>This unit may vary according to:</p> <ul style="list-style-type: none"> • 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:	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p>
--------------------------------	---

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	<p>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:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>This unit may be assessed in conjunction with:</p> <ul style="list-style-type: none"> • MSAPMSUP100B Apply workplace procedures • MSAPMSUP200A Achieve work outcomes. <p>Individual enterprises may choose to add prerequisites</p>

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	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Customers	<p>Customers may be:</p> <ul style="list-style-type: none"> internal or external
Communications	<p>Communications may include:</p> <ul style="list-style-type: none"> telephone two way radio computer equipment face-to-face interaction
Plant documentation	<p>Plant documentation may include:</p> <ul style="list-style-type: none"> 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	<p>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.</p> <p>This competency is typically performed by operators who work within a team structure, with limited discretionary powers.</p>
--------------------------------	---

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	
	<p>particular look to see that:</p> <ul style="list-style-type: none"> • 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	<p>Assessment in this competency unit may vary depending upon:</p> <ul style="list-style-type: none"> • type of communication used within each enterprise • established work practices • size and structure of the teams • team goals - individual, section and enterprise. <p>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.</p> <p>Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.</p> <p>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.</p>
Method of assessment	<p>This unit may be assessed in conjunction with:</p> <ul style="list-style-type: none"> • MSAPMSUP280A Manage conflict at work. <p>Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.</p>

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Procedures	All operations are performed in accordance with standard procedures and work instructions
Information sources and documentation	<p>This competency unit may vary according to the enterprise's use of the following information sources and documentation:</p> <ul style="list-style-type: none"> • procedures/work instructions • materials safety data sheets (MSDS) • job cards • maintenance logs • plant drawings
Typical problems	<p>Typical problems may include:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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	
	<ul style="list-style-type: none"> • 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	<p>1.1 Items to be included in work plan and specification document are identified and confirmed</p> <p>1.2 Work plan for installation and commissioning of <i>equipment and systems</i> is drawn up, including management and reporting procedures</p> <p>1.3 Specification document is prepared according to workplace and/or manufacturer procedures</p>
2 Coordinate and	<p>2.1 Contract arrangements for the installation and commissioning of</p>

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 <i>workplace practices</i>
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	<ul style="list-style-type: none"> • 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	<p>This unit does not necessarily need to be assessed in conjunction with</p> <p>other units and can be assessed independently</p>

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. 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: | <ul style="list-style-type: none"> • microprocessor or computer control • production and facility equipment used within the enterprise |
| Workplace practices may include: | <ul style="list-style-type: none"> • 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: | <ul style="list-style-type: none"> • 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	<p>Technical drawings may utilise perspective, exploded views or hidden view techniques. Drawings are provided to Australian Standard 1100 and/or Australian Standard 1102 and their equivalents from the full range of engineering disciplines.</p> <p>Standard symbols to Australian Standard 1100 and/or Australian Standard 1102 or equivalent are recognised in field of employment. Technical drawings may include symbol glossaries.</p> <p>Where any drawing, sketch, chart, diagram is only used as the technique for communication, then this unit does not apply: see Unit MEM12023A (perform engineering measurements) or Unit MEM16006A (Organise and communicate information).</p> <p>Band: A</p> <p>Unit Weight: 4</p>
--------------------------------	---

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	<p>This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with interpreting technical drawings or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning should not require language, literacy and numeracy skills beyond those required in this unit. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Guidance information for assessment	

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Interpret technical drawing

AS1100.101 is an extensive work and the candidate is not required to have complete familiarity with all its contents, the application of AS1100 would usually be in line with standard operating procedures; interpretation may require guidance particularly in respect to any geometric tolerancing

Unit Sector(s)

Unit sector

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	<p>The unit applies to the fields of mechanical, electrical/electronic, fabrication, and fluid power. Specifications may be obtained from design information, customer requirements, sketches and preliminary layouts. Manual drafting and drawing equipment is used, or where a Computer Aided Design (CAD) system is used other units should also be considered. This unit applies to any of the full range of engineering disciplines.</p> <p>Where a more extensive Computer Aided Drafting System is used for design, then Unit MEM09009C (Create 2D drawings using computer aided design system), should also be considered.</p> <p>Band: A</p> <p>Unit Weight: 8</p>
--------------------------------	---

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	<p>1.1. Requirements and purpose of drawing are determined from customer and/or work specification and associated documents.</p> <p>1.2. All data necessary to produce the drawing is identified and collected.</p> <p>1.3. Drawing requirements are confirmed with relevant personnel and timeframes for completion are established.</p>
2. Prepare or make changes to engineering drawing	<p>2.1. Drafting equipment is selected appropriate to the drawing method chosen.</p> <p>2.2. Drafting principles are applied to produce a drawing that is consistent with standard operating procedures</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>within the enterprise.</p> <p>2.3. All work is undertaken safely and to prescribed procedure.</p> <p>2.4. Completed drawing is approved in accordance with standard operating procedures.</p>
3. Prepare engineering parts list	3.1. Components parts are identified and organised by component type and/or in accordance with organisation/customer requirements.
4. Issue drawing	<p>4.1. Drawings and or parts lists records are completed in accordance with standard operating procedures.</p> <p>4.2. Approved drawings and or parts lists are copied and issued to relevant personnel in accordance with standard operating procedures.</p> <p>4.3. Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Look for evidence that confirms skills in:

- obtaining all relevant job requirements, data/information and specifications necessary to produce the drawing in accordance with workplace procedures
- using drafting equipment appropriate to the drawing method chosen
- producing/changing the drawing to conform with the relevant standard
- undertaking all work safely and in accordance with workplace procedures
- checking the completed drawing in accordance with standard operating procedures
- producing the component parts list with part name, description of part, material specification or part number, quantities and all other details specified by the customer and/or organisational procedures
- recording completed drawings and or parts lists in accordance with standard operating procedures
- where appropriate, copying and issuing approved drawings and or parts lists in accordance with standard operating procedures

REQUIRED SKILLS AND KNOWLEDGE

- handling and storing the approved drawings and or parts lists in accordance with standard operating procedures
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking and clarifying task related information
- undertaking numerical operations, geometry and calculations/formulae within the scope of this unit

Required knowledge

Look for evidence that confirms knowledge of:

- requirements and purpose of the drawing to be produced
- requirements and purpose of the engineering parts list
- sources of relevant data/ information
- timeframe for completion of the drawing(s)
- person(s) who can confirm drawing requirements
- method of drawing preparation
- the reasons for selecting the chosen drawing method
- procedures for producing an initial drawing
- procedures for changing an existing drawing
- drafting principles to be applied to the production/changing of a drawing
- standards to which the drawing is to be produced
- procedures for checking drawings
- the persons responsible for checking and approving drawings
- consequences of inappropriate/incomplete components parts lists
- procedures and reasons for recording completed drawings and or parts lists
- procedures for copying approved drawings and or parts lists
- procedures for issuing approved drawings and or parts lists
- the personnel to whom copies of approved drawings and or parts lists can be issued
- procedures for filing approved drawings and or parts lists
- procedures for safe handling and storage of drawings and or parts lists
- consequences of inappropriate handling and storage of approved drawings and or parts lists
- safe work practices and procedures

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment 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	<p>This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with preparing basic engineering drawing or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
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
------------------	------------------------------

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	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	management of OHS. 3.4 Promptly inform the work group of the outcomes of consultation over OHS issues.
4. Implement and monitor organisation procedures for identifying hazards, and assessing and controlling risk.	4.1 Implement and monitor adherence to work procedures to identify hazards and assess and control risk. 4.2 Monitor existing risk control measures and report results regularly. 4.3 Access internal and external sources of relevant OHS information. 4.4 Evaluate and identify inadequacies in existing risk control measures in accordance with the hierarchy of control, and report to designated personnel. 4.5 Identify inadequacies in resource allocation for implementation of risk control measures and report to designated personnel. 4.6 Identify actual/potential inadequacies in procedures and report to designated personnel. 4.7 Identify actual/potential inadequacies in individual or team competency and report to designated personnel.
5. Maintain and use OHS records.	5.1 Accurately and legibly complete OHS records for work area, in accordance with workplace requirements for OHS records and legal requirements for the maintenance of records of occupational injury and disease. 5.2 Use aggregated information from the area OHS records to identify hazards and monitor risk control procedures within work area according to procedures and within scope of responsibilities and competencies.

Required Skills and Knowledge

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

Knowledge and understanding of the workplace OHS system and State OHS legislative requirements, codes of practice and relevant industry standards sufficient to implement and monitor OHS activities for a work group or area within the scope of their responsibilities and competencies.

In these industries which are characterised by high potential hazard, employees need to exercise their duty of care responsibilities not only within the general OHS Acts and regulations, but also within those State and national standards applying to hazardous substances, dangerous goods and major hazards.

Competence includes the ability to apply and describe the:

- identification of hazards in the workplace and standard controls
- assessment of risk and implementation of risk control measures
- rights and responsibilities of employees under OHS legislation
- obligations of employers under the OHS legislation
- legislative requirements for information and consultation
- arrangements for consultation within the workplace
- management systems and procedures for OHS
- the hierarchy of control
- hazard policies and procedures
- safety procedures
- emergency, fire and accident procedures.

Competence also requires the ability to:

- locate, understand and follow workplace OHS procedures
- identify and communicate with all key personnel in the organisation
- identify and access relevant sources of information
- interpret OHS data such as tables of numbers and graphs
- select, recommend and use personal protective clothing and equipment.

Language, literacy and numeracy requirements

This unit requires the ability to communicate with members of the work team/area and also management. It also requires the ability to interpret and apply OHS procedures and explain them to work team members.

Writing is required to the level of being able to keep records as required and also keep notes from meetings.

Numeracy is required to interpret incident statistics and hazard data.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations that will include disruptions to normal, smooth operation.

Where the assessee does not currently possess evidence of competency in *MSAOHS200A Work safely*, it may be co-assessed with this unit.

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

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- communicate effectively with the work group(s)
- proactively promote consultation and participation in the OHS processes
- participate in decisions which impact on OHS for their workgroup.

Consistent performance should be demonstrated. In particular look for knowledge and understanding of:

- specific hazard policies and the use of hazard procedures (eg identify, assess, control)
- the consultation processes, either general or specific to OHS
- OHS information
- OHS record keeping
- counselling, disciplinary and issue resolution processes.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should cover a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the workplace, incidents on similar plants around the world, hazard analysis activities and similar sources.

Assessment method and context

Assessment for this unit of competency will be on a processing plant or in a manufacturing environment.

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

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

It is expected that this competency may be applicable in combination with other industry, occupation or workplace-specific competencies. In all cases it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Specific resources for assessment

Assessment will require access to an operating plant or manufacturing environment over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit describes OHS requirements applicable for all workers who are responsible for the organisation of OHS arrangements for a work group or area, including coaching.

It is expected that workers will be provided with clear directions, information, instruction, training and appropriate supervision regarding the relevant State/Territory OHS legislation, codes of practice, relevant industry standards, workplace procedures and work instructions.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or in environments subjected to heat, noise, dusts or vapours
- fire and explosion.

Personnel

Appropriate personnel for OHS referrals may include:

- employer
- supervisor
- employees elected as OHS representatives

- other personnel with OHS responsibilities.

Participative arrangements

Participative arrangements for OHS management may involve:

- making safety suggestions
- information sessions on existing or new issues
- meetings between employer and employees or representatives
- access to relevant workplace information
- use of clear and understandable language.

OHS Issues

OHS issues which may need to be raised by workers with designated personnel may include:

- recognition of hazards
- problems encountered in controlling risks associated with hazards
- clarification of understanding of OHS policies and procedures.

OHS Records

OHS records include:

- hazard and incident reports
- logs/logs sheets
- inspection/start up/shut down checklists
- injury reports
- maintenance records.

OHS Information Sources

Relevant sources of OHS information include:

- OHS legislation and codes of practice
- industry standards for materials, process, equipment etc
- SA/ISO standards
- OHS authorities
- unions and industry associations
- internet, journals, magazines
- manufacturer/supplier manuals/specifications
- policies and procedures
- JSA, risk assessments, HAZOPs
- hazard, incident and injury records
- training resources
- employee information brochures, newsletters etc
- OHS reports such as inspections, technical reports.
-

Unit Sector(s)

Not applicable.

MSAPMOHS400A Contribute to OHS management system

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

On completion of this unit, the worker will be able to contribute to the workplace occupational health and safety (OHS) management system and ensure that the workplace is, so far as is practicable, safe and without risks to the health of workers.

Application of the Unit

Application of this unit

This competency applies to personnel who are required to implement, monitor and improve the OHS management system. It typically applies to an OHS expert, or a supervisor or manager who has OHS particular responsibilities.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has the prerequisite of *MSAOHS300A Facilitate the implementation of OHS for a work group*.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Establish and review procedures for identifying hazards, and assessing and controlling risk.	1.1 Access current, relevant information on legislative and industry requirements for hazard identification and risk assessment and control. 1.2 Identify gaps in procedures. 1.3 Develop workplace procedures to meet requirements. 1.4 Involve relevant stakeholders in procedures development. 1.5 Review the procedures on a regular basis by consulting stakeholder groups for feedback. 1.6 Inform relevant stakeholders and other work groups of any changes and implement changes in the procedures.
2. Establish and review incident procedures	2.1 Identify legal and organisation requirements. 2.2 Identify gaps in procedures. 2.3 Develop workplace procedures for dealing with incidents. 2.4 Review the procedures by consulting stakeholder groups for feedback. 2.5 Inform relevant stakeholders and other work groups of any changes and implement changes in the procedures.
3. Implement and review training program from an OHS perspective.	3.1 Identify the legal, organisational and practical requirements for OHS training. 3.2 Evaluate the workplace training program for OHS gaps.

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	3.3 Review the program on a regular basis by consulting stakeholders and work groups for feedback. 3.4 Take appropriate action to incorporate relevant feedback into the revised program. 3.5 Inform relevant work groups of any changes and implement changes in the OHS training program.
4. Implement and review OHS recording system.	4.1 Identify the legal and organisational requirements for OHS records. 4.2 Evaluate the workplace OHS recording system for gaps. 4.3 Review the system on a regular basis by consulting stakeholders and work groups for feedback. 4.4 Incorporate relevant feedback into the revised system in consultation with stakeholders. 4.5 Inform relevant work groups of any changes and implement changes in the management of OHS record.

Required Skills and Knowledge

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

Knowledge and understanding of the workplace OHS system and State OHS legislative requirements, codes of practice and relevant industry standards sufficient to contribute to the workplace OHS management system for a work group or area within the scope of their responsibilities and competencies.

In these industries which are characterised by high potential hazard, team leaders and supervisors must be aware that employees need to exercise their duty of care responsibilities. This will be not only within the general OHS Acts and regulations, but also within those State and national standards applying to hazardous substances, dangerous goods and major hazards.

Competence includes the ability to apply and describe the:

- identification of hazards common to the industry and standard controls
- rights and responsibilities of employees under OHS legislation
- obligations of employers under the OHS legislation
- legislative requirements for information and consultation

- legislative requirements for record keeping and reporting
- appropriate consultation arrangements for the industry
- numeracy, literacy and other communication skills of work group(s)
- duty of care of employers and employees
- hierarchy of control.

Competence also requires the ability to:

- access and use the current OHSMS
- access and interpret training records
- identify and communicate with all key personnel in the organisation
- identify and access relevant sources of information.

Knowledge of related management systems, eg purchasing and IT, is also required.

Language, literacy and numeracy requirements

This unit requires the ability to interpret and apply complex documents with specific technical jargon.

Writing is required to the level of drafting policy and procedures.

Numeracy is required to the level of interpreting statistics and hazard data and setting up appropriate safety measurements.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations that will include disruptions to normal, smooth operation.

Where the assessee does not currently possess evidence of competency in *MSAOHS300A Facilitate the implementation of OHS for a work group*, it may be co-assessed with this unit.

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

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- identify/describe the workplace OHS system and State OHS legislative requirements as well as the importance of critical procedures
- recognise and analyse potential situations that require action
- implement appropriate corrective action.

There should be an underpinning understanding of the duty of care responsibilities of employer and employees.

Consistent performance should be demonstrated. For example, demonstrated knowledge and understanding of:

- all relevant workplace procedures
- the requirements that the workplace procedures should meet
- the consultation processes, either general or specific to OHS
- training and assessment of training needs
- hazard identification, risk assessment and risk control methods
- the need for specific hazard management policies and procedures
- types and sources of OHS information
- OHS record keeping systems
- the system for and process of maintenance of plant and equipment
- OHS issue resolution processes.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the workplace, incidents on similar plants around the world, hazard analysis activities and similar sources.

Assessment method and context

Assessment for this unit of competency will be on a processing plant or in a manufacturing environment.

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

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

It is expected that this competency may be applicable in combination with other industry, occupation or workplace-specific competencies. In all cases it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Specific resources for assessment

Assessment will require access to an operating plant or manufacturing environment over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies and 'what ifs' will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit covers live, real time and ongoing routine hazard identification and risk assessment.

This unit describes OHS requirements applicable for those with responsibilities for contributing to the workplace OHS management system within a work group or area. This may be as a team leader or as a supervisor. Roles and responsibilities will vary from organisation to organisation.

Review of activities may include review of written reports, performance appraisal or auditing procedures.

Competence is demonstrated in the context of an organisation where the OHS system with related policies, procedures and programs is already established. The role will relate to the maintenance and upkeep of the system.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours
- fire and explosion.

OHS Information

Sources of relevant OHS information include:

- OHS legislation and codes of practice
- industry standards for materials, process, equipment etc
- SA/ISO standards
- OHS authorities

- unions and industry associations
- Internet, journals, magazines
- manufacturer/supplier manuals/specifications
- policies and procedures
- JSA, risk assessments, HAZOPs
- hazard, incident and injury records
- training resources
- employee information brochures, newsletters etc
- OHS reports such as inspections, technical reports.
-

Unit Sector(s)

Not applicable.

MSAPMOHS401A Assess risk

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

On completion of this unit, the worker will be able to identify hazards and operability problems and then analyse them by hazard analysis techniques to assess risk.

Application of the Unit

Application of this unit

A team with a broad knowledge of the system and its operation will carry out the analysis. It is expected that the risk assessment processes are already defined for the enterprise and that the risk acceptance criteria have already been established. The team will be steered by engineering experts or risk assessment specialists in the industry. This competency applies to workers who, in a typical scenario, take an active role in a HAZOP or similar methodology. They are not expected to lead the HAZOP. This unit is not restricted to HAZOPs and may be applied to other methodologies requiring similar competency. The risk assessment should be consistent with AS 4360 - Risk Management.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Identify hazards and potential operability problems.	1.1 Contribute to the compiling of a system description of all the machinery, equipment, operations, products and materials relevant to the everyday working procedures of the facility. 1.2 Contribute to the compiling of a checklist containing process parameters (primary key words) and guide words (secondary key words) relevant to the system. 1.3 Identify hazards, existing control measures and potential operability problems or breakdowns in control measures using the compiled system descriptions and the checklist.
2. Assess impact of risk and determine alternative strategies.	2.1 Screen for causes of deviations and establish consequences. 2.2 Determine alternative strategies for action in relation to each deviation within the range of competency and responsibility. 2.3 Review, clarify and/or analyse risk information to determine its relevance and reliability depending upon the task assigned, level of competency and area of responsibility.
3. Assess risk information against established risk criteria in risk management plan.	3.1 Check risk acceptance criteria for any changes over past period. 3.2 Compare risk information against risk acceptance criteria and procedures to assess acceptability of risk.

ELEMENT ELEMENT	PERFORMANCE CRITERIA
	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	3.3 Conduct liaison with other Internal departments to assess impact on business if applicable. 3.4 Document findings according to company policies and procedures.
4. Develop a risk register.	4.1 Develop a risk assessment chart for each system studied containing deviation, cause, consequence, control measures and action. 4.2 Develop action plan for implementation of control measures, including any changes to procedures. 4.3 Establish or review the procedures by consulting relevant/different work groups. 4.4 Inform relevant work groups of any changes and implement, within area of responsibility, changes in the procedures. 4.5 Monitor effectiveness of the control measures including revised procedures.
5. Establish and maintain procedures for identifying hazards, and assessing and controlling risk.	5.1 Identify and develop procedures for routine hazard identification, assessment and control of risks. 5.2 Address identification of all hazards at the planning, design and evaluation stages of any changes in the workplace to ensure that new hazards are not created by the proposed changes. 5.3 Develop and maintain procedures for selection and implementation of risk control measures in accordance with the hierarchy of control. 5.4 Identify inadequacies in existing risk control measures in accordance with the hierarchy of control and, within area of responsibility, promptly provide resources enabling implementation of new measures.

Required Skills and Knowledge

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

This unit requires the ability to apply a consistent risk assessment methodology which is appropriate to the workplace being assessed. One example of this is the HAZOP methodology, but other methodologies may be used.

Some understanding of quantitative risk assessment, such as HAZAN, is also required.

The requirements of the relevant OHS act and regulations with regard to risk assessment should be known and followed.

Knowledge includes:

- identification of hazards and how hazard controls may break down
- an understanding of risks and how they may be reduced
- the modelling and evaluation of a wide range of failure modes
- analysis which is auditable, repeatable, verifiable and usable by other staff
- analysis systems appropriate to the system operating in the given domain and appropriate for the particular life cycle phase at which it is to be applied
- determining valid results from data of the quality and quantity actually available
- use of standard pro-formas to support the technique
- a rational technical base which may include reference to national or international standards, defence standards or published reference books.

Language, literacy and numeracy requirements

This unit requires the ability to interpret process plant descriptions and drawings.

Writing is required to the level of making the required reports for the process.

Numeracy is required to interpret hazard and probability data and determine risk profiles.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Assessment will occur by analysing an appropriate industrial site and will be undertaken in a work-like environment.

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

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- know and understand the workplace systems and the importance of critical procedures
- apply a working knowledge of all relevant workplace procedures.

Consistent performance should be demonstrated. For example, look to see that the techniques used:

- enable identification of hazards and how hazard controls may break down
- enhance the understanding of risks and how it may be reduced
- permit the modelling and evaluation of a wide range of failure modes
- enable the analysis to be carried out in a manner that is auditable, repeatable and verifiable
- are usable by other staff
- are appropriate to the system operating in the given domain
- give valid results from data of the quality and quantity actually available
- are appropriate for the particular lifecycle phase at which it is to be applied
- provide standard pro-formas to support the technique
- have a rational technical basis which may include reference to national or international standards, defence standards or published reference books.

These aspects may be best assessed using a range of scenarios/case studies and 'what ifs' as the stimulus with a walk through forming part of the response. These assessment activities should cover a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the plant/equipment, incidents on similar plants around the world, past hazard analysis activities and similar sources.

Assessment method and context

Competence in this unit may be assessed:

- on an appropriate, industrial plant/site
- in a situation allowing the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent they form part of the assessment method.

Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit will be completed as a specialist unit (eg by plant technicians) requiring technical knowledge.

The aim of this competency unit is to apply a methodical examination of the system and its elements to identify hazards and the states or conditions where there may be loss of control of the hazard and the resultant consequences. The results of the hazard analysis should be expressed clearly and concisely, and include where possible tables and diagrams. Team members would contribute their understanding of the process and particularly the operational aspects, and then carry out whatever tasks are assigned to them by the analysis team.

While this competency aims to enable a person to identify hazards and assess risk through a systematic approach, more than 80% of recommendations can be operability problems and are not, of themselves, hazards. Although hazard identification should be the main focus, operability problems should be identified to the extent that they have the potential to lead to a breakdown in hazard controls resulting in a health, safety or environmental violation or have a negative impact on profitability.

The degree of depth of a checklist should be dependent on the knowledge of the system at the time the study is carried out. This technique can therefore be applied at any stage of the project/process lifecycle.

Screening for deviations includes accessing internal and external data that may provide information about previous incidents or warnings of incidents. Sources of such information may include:

- internal hazard and incidents reports, maintenance records, audit reports
- reports from similar plants, factories, industry bodies, regulators, journals etc of actual incidents or reports that have relevance to the situation being analysed.

Examples of risk assessment tools may range from relatively simple to more complex HAZOP analyses and other methodologies requiring similar competency.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours
- fire and explosion.

Problems

Typical process and product problems may include:

- incidents with a potential for injury
- fires, explosions
- chemical spills
- bomb scares.

Process Parameters

Specific process parameters (primary key words) relevant to the system may include:

- flow
- temperature
- pressure
- relief
- instrumentation
- sampling
- addition
- safety
- reaction
- reduce (grind, crush)
- absorb
- isolate
- vent
- start-up
- composition
- phase
- level
- corrosion
- erosion
- services

- utilities
- maintenance/maintain
- inserting
- purging
- contamination
- separate (settle, filter, centrifuge)
- mix
- drain
- shutdown.
-

Unit Sector(s)

Not applicable.

MSAPMOHS503A Maintain the workplace OHS management system

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the ongoing maintenance of the OHS management system (OHSMS) within the area of managerial responsibility, in order to ensure that the workplace is, so far as is practicable, consistently safe and without risks to the health and safety of employees. It assumes that the OHSMS has been developed by persons with the relevant specialist knowledge and skills.

Application of the Unit

Application of this unit

This competency applies to personnel with a specialised responsibility for maintaining the workplace OHSMS. This will typically be a manager, team leader or a technician with particular OHS responsibilities. The work will be carried out with the support of other team members.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.
1. Manage OHS information in the workplace	1.1 Take action to ensure that requirements for OHS record keeping and reporting are implemented according to workplace procedures and legislative requirements. 1.2 Access sources of OHS information and evaluate for application to the workplace. 1.3 Collect and collate data and information to provide information to managers and stakeholders on OHS requirements, trends and risk controls.
2. Support implementation of OHSMS	2.1 Determine OHS priorities in consultation with appropriate managers and stakeholders. 2.2 Identify OHS training needs for implementation and maintenance of the OHSMS. 2.3 Develop action plans taking account of priorities and training needs. 2.4 Monitor achievement of action plans and update plans accordingly.
3. Support OHS participative arrangements	3.1 Ensure OHS information and documentation is understandable and accessible to all. 3.2 Promptly address OHS issues that may arise within area of authority or refer to appropriate person. 3.3 Provide information about the outcomes of OHS consultation in a manner that is accessible to all.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.
4. Collect data to evaluate currency of OHSMS.	4.1 Identify, in consultation with stakeholders and, as required expert advisors, internal data and information that provides relevant and reliable information on the performance of the OHSMS. 4.2 Conduct workplace inspections on a regular basis. 4.3 Identify workplace OHS implications of any changes to legislation. 4.4 Identify any OHS implications to proposed changes to the workplace. 4.5 Take action to arrange an OHSMS audit.
5. Analyse data and information to identify areas for improvement	5.1 Assess compliance of OHSMS with OHS legislation. 5.2 Analyse information collected to identify areas for improvement. 5.3 Consult with stakeholders, key personnel and, as required, OHS advisors. 5.4 Document and communicate outcomes of analysis to key personnel and stakeholders in an easily understood format. 5.5 Recognise limits of own expertise and seek appropriate advice.
6. Initiate and maintain improvements.	6.1 Determine priorities for OHS in consultation with stakeholder. 6.2 In consultation with stakeholders, develop an OHS plan with responsibilities and time frames. 6.3 Identify and source resources required for implementation of plan. 6.4 Monitor achievement against plan. 6.5 In consultation with stakeholders, monitor effectiveness of modifications to OHSMS on an ongoing basis.

Required Skills and Knowledge

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

Knowledge and understanding of the workplace OHSMS and State OHS legislative requirements, codes of practice and relevant industry standards sufficient to maintain, evaluate and improve the workplace OHS management system within the scope of their responsibilities and competencies.

Management must be aware that, while employees have OHS responsibilities, line managers are ultimately responsible, under both OHS legislation and common law duty of care, for the safety of the workplace, including ensuring that employees comply with documented work procedures. This legislation includes general OHS legislation as well as that for hazardous substances, dangerous goods and major hazard sites.

Competence in this unit includes the ability to apply a working knowledge of the workplace, relevant OHS legislation and OHSMS to:

- maintain an OHSMS already defined and established
- identify types of data and information that will provide information on the effectiveness of the OHSMS in minimising risk
- analyse the data to identify areas for improvement in elements of the OHSMS, including communication and consultation, reporting and hazard identification, risk assessment and risk control,
- develop strategies for improvement in the OHSMS
- apply the hierarchy of control to recommend actions to minimise risk
- OHS record keeping and reporting as required under:
 - hazardous substances and dangerous goods legislation
 - OHS legislative requirements to report serious incidents and injuries and keep records of risk assessments
- creation and management of other record such as:
 - hazard and incident reports, investigation reports
 - completed workplace inspection checklists and reports
 - external or internal reports
 - minutes of meetings.

Language, literacy and numeracy requirements

This unit requires the ability to communicate in all modes and at all levels conveying what is often technical content/ideas.

Writing is required to the level of writing the required reports and documents.

Numeracy is required to interpret and manipulate the necessary data.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Assessment will occur on an industrial site and will be undertaken in a work-like environment.

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

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- interact with the workforce to maintain the process that comprise the OHSMS
- access and analyse information to identify areas for improvement
- develop appropriate improvement strategies
- apply a quality improvement process to implement and monitor change

Consistent performance should be demonstrated. For example, look to see that the required level includes a working knowledge of the workplace OHSMS. Look to see knowledge and understanding of:

- OHS responsibilities of all levels in the workplace
- the consultation processes, either general or specific to OHS
- hazard identification and risk assessment
- implementation of risk control measures by applying the hierarchy of control
- new and relevant OHS information
- OHS record keeping
- OHS issue resolution legislative requirements for consultation prior to the implementation of change
- sources and types of information that provide realistic information on the performance of the OHSMS
- techniques for analysing OHS data, including simple statistical analysis and graphing of trends
- types of internal and external change that may impact on OHS.

These aspects may be best assessed in a realistic workplace. Where this is difficult to access then steps should be taken to arrange access to realistic data and a visit to a workplace.

Scenarios and case studies may provide a suitable adjunct. These assessment activities should include a range of problems that may be encountered when maintaining reviewing and implementing improvement to the OHSMS.

Assessment method and context

Competence in this unit may be assessed:

- on an appropriate, industrial plant/site
- in a situation allowing the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit describes OHS requirements applicable for those with managerial responsibilities for maintaining and improving an established OHSMS within the organisation. This may be as a worker or as an owner of a business. This competency assumes that the OHSMS has been established by others, either internal or external and that expert advice is available either internally or externally.

The competency is to be exhibited within the area of managerial responsibility, which may be an entire organisation or department of an organisation. Roles and responsibilities will vary from organisation to organisation.

While relevant positions for maintaining and improving the OHSMS will include managers, OHS officers/managers it should be quite clear that the legal responsibility for OHS rests with the line managers.

Analysis of data may include statistical analysis, qualitative analysis or informal review.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Hazards

Typical hazards include:

- handling chemicals and hazardous materials
- chemical and or hazardous materials spillage
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours
- fire and explosion.

OHS Information Sources

Sources of OHS information may be external and include:

- OHS legislation, codes of practice and Australian and International standards
- OHS regulators and Australian Safety and Compensation Council (ASCC)
- industry bodies
- Internet sites, journals and newsletters
- OHS policies and procedures
- manufacturer manuals
- risk assessments, JSAs, workplace inspections
- MSDSs and registers
- hazard and incident reports.
-

Unit Sector(s)

Not applicable.

MSAPMOHS510A Manage risk

Modification History

Release 2 – updated to be consistent with ISO 31000:2009 Risk Management – Principles and Guidelines. Previous unit referred to Australian Standard (AS/NZS 4360:1999). Reformatted - Equivalent.

Unit Descriptor

This unit covers the development, implementation and evaluation of an organisation-wide risk management plan. It incorporates an assessment of all potential risks facing the organisation and the approach, the management components and resources to be applied to the management of risk.

Application of the Unit

This unit applies to managers or work health and safety (WHS) specialists who are developing or maintaining a risk management plan for their site or organisation. This unit is based on ISO 31000:2009 Risk Management – Principles and Guidelines, and as such may be applied quite broadly. However, it is probably best applied to health, safety and environment risks and the business and other risks consequent on them.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MSAPMOHS401A Assess risk

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

1	Develop risk management plan	1.1	Analyse and interpret strategic position and policy on risk management
		1.2	Identify risk management context and potential areas of risk
		1.3	Analyse organisational capability to manage risk and achieve objectives
		1.4	Generate a comprehensive list of risks that could affect the achievement of the organisation's objectives
		1.5	Establish or review risk management policies
		1.6	Evaluate the requirement for training/education for all groups and individuals
		1.7	Identify access to external specialist assistance
		1.8	Establish appropriate risk assessment techniques
		1.9	Consult stakeholders in the development of the plan
2	Implement risk management plan	2.1	Define, in consultation with stakeholders, the criteria used to evaluate the significance of risk
		2.2	Evaluate and prioritise risks for treatment
		2.3	Determine and select the most appropriate options for treating risks
		2.4	Implement and monitor risk treatment plan
		2.5	Document strategies for risk treatment options

3	Evaluate risk management plan	3.1	Establish procedures to regularly review risk management activities
		3.2	Ensure stakeholders have input to the review
		3.3	Examine activities that do not achieve their objective/ performance outcomes to determine cause
		3.4	Identify targets for improvement and update plan
		3.5	Establish evaluation of risk management as a key component of all projects/activities

Required Skills and Knowledge

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

Required skills

Required skills include:

- the ability to communicate high-level material using all modes of communication to all levels
- writing to the level of writing reports, policies and procedures
- numeracy to interpret and manipulate technical data

Required knowledge

The person must demonstrate understanding of specialised knowledge with depth in some areas. Required knowledge is to be limited to that which is sufficient to perform particular risk management functions. Competence includes the ability to apply and explain:

- AS/NZS ISO 31000:2009 Risk Management - Principles and Guidelines
- relevant legislation from all levels of government that effects business operation, especially in regard to WHS and environmental issues, equal employment opportunity (EEO), industrial relations and anti-discrimination
- the legal implications of deeming identified risks as acceptable
- strategic, tactical and operational plans of the organisation
- legal requirements for operating the business relevant to the area of responsibility
- relevant awards and industrial agreements
- workplace standards for WHS and environmental management
- internal or external audit methods
- focus group processes
- risk analysis processes

- investigation reports
- review of data, such as risk and incident reports, maintenance records and production records

Evidence Guide

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

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

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

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- develop, implement and evaluate the development of plans to eliminate, isolate or protect people (and/or equipment) in the event of a potential negative event occurring.

The emphasis should be on the ability to avoid/eliminate critical incidents rather than on recovery from a disaster.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and extreme situations that may have been generated from the past incident history of the workplace, incidents on similar plants around the world, hazard analysis activities (e.g. HAZOP) and similar sources.

Context of and specific resources for assessment

Assessment will occur in an industrial site/plant and will be undertaken in a work-like environment.

Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent they form part of the assessment method.

Questioning may take place either in the workplace, or in an adjacent, quiet facility, such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Method of assessment

Competence in this unit may be assessed:

- on an appropriate, industrial plant/site
- in a situation allowing the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the required knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Guidance information for assessment

Assessment processes and techniques must be appropriate to the language, competency and safety requirements of the organisation and consistent with workplace systems or procedures.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Context

Risk management is defined as coordinated activities to direct and control an organisation with regard to risk. The risk management plan should specify the approach, the management components and resources to be applied to the management of risk.

External specialist assistance

External specialist assistance may include but is not

limited to any group or individual in the community who has the expertise to assist the organisation to deal with any event/incident which may occur.

Risk

Risk is the effect of uncertainty on objectives. Risk may include but is not limited to:

- injury or disease
- environmental factors
- product failure
- financial/economic loss/failure
- damage to property/plant/equipment
- industrial disputes
- professional incompetence
- natural disasters
- security failure (including criminal or terrorist activities)
- equipment/system failures
- political events

Appropriate options for treating risks

Appropriate options for treating risks may include but are not limited to:

- compatibility with organisation policy
- feasibility of implementing
- validity of proposed treatment

Legislation

Legislation, codes and national standards relevant to the workplace may include:

- award and organisation agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to WHS, environmental issues, equal employment opportunity (EEO), industrial relations and anti-discrimination
- relevant industry codes of practice

Procedures

All operations are performed in accordance with procedures. Procedures include:

- all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an

apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Not applicable.

MSAPMOPS100A Use equipment

Modification History

Release 2 – Minor clarification changes to application and range, and minor editorial corrections.

Unit Descriptor

This unit covers the use of any item of equipment which is operated with limited application of knowledge.

Application of the Unit

This unit applies to all persons who have the responsibility for using equipment where they are not required to have any significant understanding of the equipment or the process.

In a typical situation the operator may be using, for example, a packaged chilled water refrigeration unit to supply chilled water to the plant. The operator uses simple controls and responds to fault alarms built into the equipment. Even though the equipment may be very sophisticated (e.g. using high-speed compressors and computerised monitoring and control equipment) the operator interface is relatively simple. The operator is expected to simply regard this equipment as a black box – they may know what it does, but little detail on how it does it.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

Where greater levels of understanding and interaction are required, then the appropriate 200 series technical unit should be used.

This unit has been written to apply to fluids as well as solids and may be applied wherever 'black box' equipment is used.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

This unit has **no** prerequisites.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

- | | |
|--|--|
| 1. Follow workplace procedures | 1.1 Find out what is required for the job
1.2 Identify and follow appropriate procedures
1.3 Complete all reporting as required
1.4 Recognise and report anything unusual |
| 2. Monitor and use the equipment/process | 2.1 Turn the equipment on and off as required by procedure
2.2 Monitor equipment throughout the job using measurements, readings and senses as appropriate
2.3 Recognise deviations from standard/desired conditions
2.4 Take appropriate corrective action |

Required Skills and Knowledge

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

Minimal knowledge of the equipment and procedures but sufficient to recognise abnormal operating conditions and alert the appropriate individuals.

Knowledge of organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes the ability for the practical completion of the job to:

- describe appropriate safety procedures concerning the operation of the equipment, procedures relating to the reporting of hazardous conditions, and appropriate shutdown procedures
- recognise a situation requiring action and take the action specified in the procedures, and report the situation as specified in the procedures.

Language, literacy and numeracy requirements

This unit has minimal literacy and numeracy requirements other than those required to start and stop the equipment and recognise common problems (e.g. reading gauges).

Evidence Guide

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

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

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

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- use the equipment for the specified purpose
- operate the equipment within the prescribed operating limits
- identify when the equipment is not operating as prescribed
- correctly monitor the equipment's operation
- report equipment malfunctions or problems according to procedures.

Consistent performance should be demonstrated. For example, look to see that:

- standard procedures are followed
- deviations from desired conditions are recognised
- action specified in the standard procedures is carried out
- work is carried out safely.

Assessment method and context

Assessment will occur on an appropriate item of equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- on a processing plant allowing for operation under all normal and a range of abnormal conditions
- in a situation allowing the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

Standards and codes

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency applies to operators new to the job or operators at any level using equipment where significant understanding of the equipment or process is not required. It applies to any item of equipment which may be used in any sector. It may include:

- compressors (packaged plant)
- refrigeration (packaged plant)
- fans
- blowers
- portable generators
- air conditioning units

	<ul style="list-style-type: none">• other equipment with similar operating requirements
Packaged plant	<p>Packaged plant includes:</p> <ul style="list-style-type: none">• 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	<p>All operations are performed in accordance with procedures.</p> <p>Procedures mean all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.</p>
Hazards	<p>Typical hazards include:</p> <ul style="list-style-type: none">• rotating components• drive chains or belts• hot or cold equipment parts• dust, vibration, noise or fumes• oil spills• fuel leaks
Corrective action	<p>Taking appropriate corrective action includes:</p> <ul style="list-style-type: none">• reporting to the appropriate people or such other specific actions which have been previously defined for specific occurrences
Variables	<p>Key variables to be monitored include:</p> <ul style="list-style-type: none">• 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

Release 2 – Minor clarifications to application and range, and minor editorial corrections.

Unit Descriptor

This unit covers the skills and knowledge needed to operate a plant item/unit of equipment and the resolving of routine problems in accordance with procedures. This competency is for units of equipment/plant items which are not otherwise covered in this Training Package and may be organisation specific.

Application of the Unit

This unit applies to a person who has the responsibility for undertaking the routine operation of an individual unit of equipment or a plant item. The key factors are operating to organisation requirements, meeting quality standards and other workplace requirements. The type of people to whom this unit may apply include (but are not limited to):

- plant operators.

This unit applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator as appropriate.

This unit applies:

- typically to ‘outside’ or ‘field’ operators, but may also apply to
- ‘panel’ or ‘control room’ operators.

This unit requires a detailed knowledge about the unit being operated and some knowledge about related units and processes.

This unit has been written to apply to both fluid and solids processing units. It does not include the operation of any packaged unit which only requires operation as a ‘black box’ (regardless of its engineering complexity) which is covered by MSAPMOPS100A Use equipment.

If several units are combined to form a unit which must be operated as an integrated unit then please see PMAOPS300B Operate a production unit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

This unit has **no** prerequisites.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

- | | |
|--|---|
| 1 Check work requirements | 1.1 Identify work requirements from work plan or request
1.2 Check product, materials and equipment meet requirements for job(s)
1.3 Recognise requirements which may not be in accordance with usual practice
1.4 Ask questions of appropriate person to confirm unusual practice
1.5 Ensure housekeeping is to requirements
1.6 Identify hazards associated with the job and take appropriate action
1.7 Perform other pre-operational checks in accordance with procedures |
| 2 Start up item of equipment as required | 2.1 Conduct pre-start checks
2.2 Start up item of equipment |
| 3 Operate equipment | 3.1 Check equipment is operating within required limits |

- to procedures
- 3.2 Check product meets specifications and quality standards
 - 3.3 Ensure product is consistently ready for next duty/ operation as appropriate
 - 3.4 Maintain supply of material(s) as required
 - 3.5 Complete logs and records as required
 - 3.6 Collect and segregate scrap, trim and other materials as required
 - 3.7 Keep equipment and work area clean
 - 3.8 Pause equipment and perform emergency stop, as required
- 4 Respond to routine problems to procedures
- 4.1 Recognise known faults that occur during the operation
 - 4.2 Identify and take action on causes of routine faults
 - 4.3 Log problems as required
 - 4.4 Identify non-routine process and quality problems and take appropriate action

Required Skills and Knowledge

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

Application of knowledge of the materials, equipment and process sufficient to recognise out of specification products, process problems and materials faults.

Knowledge of the organisation's procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Knowledge of and skills in the operation of the item of equipment and main components sufficient to consistently meet required specifications and standards, including:

- operation of equipment and components
- workflow sequences and materials demand
- reasons for checking process control panels and reporting readings which do not conform to the work instructions
- approved hazard control and safety procedures and the use of PPE in relation to handling materials and using equipment
- equipment operation and clean-up; potential effects of variations in raw materials and equipment operation in relation to quality of product
- waste management and importance of reusing non-conforming products wherever

possible

- correct selection and use of equipment, materials, processes and procedures
- monitor equipment operation and product quality
- identify factors which may affect product quality or production output and appropriate remedies
- distinguish between possible causes of routine faults, such as:
 - incorrect quantity of materials
 - contaminated materials/additives
 - equipment faults/damage
 - wrong raw materials/additives
 - machine failure.

Competence also includes the ability to:

- plan own work, including predicting consequences and identifying improvements
- identify when the operator is able to rectify faults, when assistance is required and who is the appropriate source for assistance
- identify and describe own role and role of others involved directly in the process.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, e.g. to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

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

Overview of assessment A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Assessment will occur on an industrial example of the equipment and will be undertaken in a work-like environment.

Critical aspects for It is essential that competence is demonstrated in the knowledge

assessment and evidence required to demonstrate competency in this unit

and skills defined in this unit. These may include the ability to:

- operating the plant unit
- following approved procedures
- take appropriate action to resolve faults or report faults to appropriate personnel
- explain and implement relevant emergency procedures.

Consistent performance should be demonstrated. For example, look to see that:

- production standards are met consistently
- upstream and downstream communication is timely and effective operating procedures and work instructions are read and interpreted correctly
- problems are identified and appropriate action is taken (i.e. the problem is fixed or reported)
- all safety procedures are followed.

Assessment method and context

Competence in this unit may be assessed:

- in an appropriate, industrial item of equipment requiring demonstration of operation start and stop procedures
- in a situation allowing the generation of evidence of the ability to respond to problems
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or

assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

Standards and codes	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency applies to operators working either independently or as part of a work team.
Procedures	<p>All operations are performed in accordance with procedures.</p> <p>Procedures mean all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.</p>
Tools and equipment	<p>This competency includes use of equipment and tools, such as:</p> <ul style="list-style-type: none">• 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	<p>Typical hazards include:</p> <ul style="list-style-type: none">• spills• dusts/vapours• slips trips and falls• temperature• hazardous substances• moving equipment• manual handling hazards
Problems	<p>'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:</p> <ul style="list-style-type: none">• equipment malfunction• variations in process conditions• variations in materials or contamination of materials• equipment, tool, die or mould damage• routine product faults

- machine malfunction
- mould/tooling problems
- variations in materials and/or contamination of materials

Variables

Key variables to be monitored include:

- atmospheric conditions
- temperature (hot/cold) variations in equipment or product
- die/product tolerances
- system/operating pressure
- programming variables
- operator variability
- timing or product cycles

Product

Product includes anything produced by a process step and so includes intermediate products such as the product from one process step which then becomes the feed for another

Unit Sector(s)

Not applicable.

MSAPMOPS212A Use organisation computers or data systems

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the use of organisation computers or data systems in order to work effectively. The operator is familiar with the system, can locate and use the appropriate data and is able to accurately record data into the system as required. This competency covers the use of computer equipment and company software programs, including selecting the correct programs for use and identifying minor faults in equipment or software.

This competency is typically performed by operators working either independently or as part of a work team.

Application of the Unit

Application of this unit

This competency applies to operators who are required to store and retrieve data, and produce documents, spreadsheets relevant to operational or administrative functions within the organisation. It includes:

- inputting data to the systems as required
- locating and accessing data as required for production support/problem solving
- using data to support business objectives
- producing construction documents, reports and spreadsheets
- running system checks and virus scans manually if automated systems fail
- producing required documentation within the security limits imposed by the company.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Identify applications of computer or data system for work role.	1.1 Identify data and information available from the system and its application to work role. 1.2 Identify data from work role which needs to be entered in the system.
2. Use the computer/data system.	2.1 Adjust work station equipment to meet ergonomic requirements and use appropriate posture. 2.2 Log-on according to procedures. 2.3 Navigate system as required. 2.4 Input data or make changes as required. 2.5 Check entered or edited data is correct. 2.6 Access required data/information. 2.7 Output data as required. 2.8 Use 'Help' as needed.
3. Save file and exit system.	3.1 Save and store data in appropriate directory or folder. 3.2 Close file and exit applications programs without loss of data.

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
	3.3 Back-up data if required in accordance with procedures.
4. Respond to routine problems with the system	4.1 Recognise known faults that occur during the operation. 4.2 Identify and take action on causes of routine faults. 4.3 Log problems as required. 4.4 Identify non-routine process and quality problems and take appropriate action.

Required Skills and Knowledge

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

Knowledge of organisation procedures and relevant regulatory requirements along with the ability to implement them within appropriate time constraints and work standards.

Competence includes an understanding of the organisation data system to the level needed to use the system and recognise and resolve problems. In particular it includes the ability to:

- demonstrate the operation of and access to data from the system
- describe the scope and range of data required from the system, in order to support the solution of problems
- describe the nature of the scope and range of available data
- describe the causes and remedies of common problems such as those selected in the Range Statement
- describe principles of operation of the equipment and software, hazard policies and procedures, job procedures and work instructions
- explain the application of software in relation to work role.

Competence also includes the ability to isolate the causes of problems to a component of the organisation data system and to distinguish between causes of problems such as:

- incorrect or misleading data
- system software faults
- system equipment faults.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets and material labels as provided to operators.

Writing is required to the level of completing workplace forms

Numeracy is also required to the extent of requiring competence in essential mathematical functions including + - x and ÷.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

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

It is essential that competence is demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The reasoning process behind the problem analysis and determining the required actions should be assessed.

Consistent performance should be demonstrated. For example, look to see that:

- in-plant computer programs are correctly utilised
- software problems are recognised and solved effectively and efficiently
- documents are completed to the standard required
- the operation and access to data from the system can be demonstrated
- data can be input and output from the system as required
- obvious problems in related to operation of the system are recognised and an appropriate contribution made to their solution.

Assessment method and context

Assessment will occur using industrial equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- on a processing plant allowing for operation under all normal and a range of abnormal conditions
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit of competency includes organisation computer and data systems. This may include systems which cover (select relevant items):

- Word and Excel documents
- safety, safety data and injury reporting
- orders, purchasing, stock levels and scheduling
- stock control, stores, warehousing and logistics
- materials hazards, labelling, materials identification, materials safety data sheets (MSDSs)
- batch data, schedules, production planning and operations planning
- product quality, statistical control, production trends and quality control
- maintenance, maintenance planning, procedures and spare parts.

The organisation systems will usually be computerised, but may include data sheets, paper or hard copy records, manuals and instructions.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- computers - stand alone and/or networked
- mobile terminals and hand held devices
- printers
- mouse, keyboard
- facsimile equipment
- onboard terminals
- scanners
- bar coders.

Software applications may include:

- CC mail and email
- Internet or intranet
- word processing, database and spreadsheet programs
- company/process specific software
- word processing, database and spreadsheet programs.

Documents may include:

- work orders
- work instructions/standard operating procedures
- email or CC mail
- faxes
- memos
- tables
- standard letters
- standard reports.

Hazards

Typical hazards include:

- repetition strain injuries
- glare from monitor screens
- damages cables or connections
- strains or injuries moving computer equipment.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- software problems, such as unable to access file, find correct page or send CC mail, input data.

- loose or disconnected cables
- 'frozen' screens
- faulty monitors
- key board problems.

Variables

Key variables to be monitored include:

- types of hardware systems
- access and log on procedures
- types of software packages
- Internet/intranet systems
- types of data to be stored and retrieved.
-

Unit Sector(s)

Not applicable.

MSAPMOPS400A Optimise process/plant area

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency covers the ability to optimise the process performance of a complete plant area. It includes ensuring that production systems comply with Health, Safety and Environment (HSE) requirements, that process, plant and equipment utilisation is planned and carried out, and that problems are solved to fully meet operational needs and ensure that production of finished goods meets customer requirements.

Application of the Unit

Application of this unit

This competency requires the application of detailed operational and process knowledge, including the principles of operation of equipment, and the chemistry and/or physics and/or biology/biochemistry of changes to materials occurring during processing. It embodies a significant breadth and depth of technical knowledge and process understanding.

Assessment of this competency should ensure that the applicant can apply this knowledge to a process, and should typically rely on the applicant undertaking, or leading, a significant process improvement project.

This competency is typically performed by a senior operator, team leader or frontline manager.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit **has** prerequisites of

- MSAPMSUP390A Use structured problem solving tools
-

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Analyse and evaluate current plant, equipment and processes.	1.1 Compare actual process, plant and equipment performance with requirements and/or historical data/records and/or design performance. 1.2 Identify abnormal or sub-optimal process, plant and equipment performance. 1.3 Identify hazards associated with the plant and equipment. 1.4 Collect and evaluate product, materials and/or process records to determine possible causes for sub-optimal performance. 1.5 Use appropriate techniques to rank possible causes from most to least probable cause.
2. Develop plan for corrective and/or optimisation action.	2.1 Analyse cause(s) to determine appropriate corrective action. 2.2 Predict the impact of a change in one unit/area on other related plant units/areas. 2.3 Predict the impact of a change on health, safety and environmental performance 2.4 Develop measurable objectives and evaluate alternatives.

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
	2.5 Identify requirements to implement change. 2.6 Consult with stakeholders regarding planned changes and impacts. 2.7 Develop optimisation plan taking account of hazards identified and HSE implications and communicate to appropriate personnel. 2.8 Evaluate optimisation action to determine measures of effectiveness.
3. Coordinate corrective and/ or optimisation action plan	3.1 Coordinate all appropriate unit areas and operations in order to rectify problem causes in process, plant and equipment performance. 3.2 Initiate and/or implement all required corrective/ optimisation actions. 3.3 Communicate corrective/optimisation outcomes to all relevant personnel. 3.4 Implement procedures/systems to eliminate possible future causes. 3.5 Record and maintain log of all relevant information.
4. Develop continuous improvement strategies.	4.1 Review sources of information to identify possible factors causing sub-optimal performance. 4.2 Identify options for removing or controlling the risk of sub-optimal performance. 4.3 Assess the adequacy of existing control and quality methods and systems. 4.4 Identify opportunities to continuously improve performance. 4.5 Develop recommendations for continual improvement of process, plant and equipment effectiveness. 4.6 Consult with appropriate personnel and implement continuous improvement strategies. 4.7 Document implementation of continuous improvement strategies.

Required Skills and Knowledge

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

Knowledge and understanding of the:

- equipment,
- processes
- systems

sufficient to

- identify hazards associated with the process
- recognise opportunities to improve and/or enhance the quality of performance of the plant.

This knowledge needs to include:

- the relevant technical theory of the plant area
- an in depth understanding across the entire plant area
- the organisation standard procedures and work instructions
- relevant regulatory requirements, including those related to OHS risk control as appropriate to process/plant area optimisation.

Competence includes the ability to:

- apply analytical skills which enable corrective or optimal conditions to prevail
- identify and control hazards by applying the hierarchy of control as part of the optimisation process
- interpret information and make appropriate process control decisions.

Competence includes the ability to distinguish between:

- optimum and marginal performance of the plant
- effective and marginal performance corrections and actions.

as is relevant to the practical operation of all major equipment/process/systems within the area.

Optimising process systems requires application of detailed operational and process knowledge to address issues such as:

- starting material quality
- yield maximisation
- throughput maximisation
- energy efficiency
- use of utilities
- labour utilisation
- overall cost
- efficient use of equipment
- reducing downtime
- minimisation of waste and rework
- improved workplace layout and workflow.

Language, literacy and numeracy requirements

This unit requires the ability to communicate at all levels about what may be complex technical matters. It also requires the ability to evaluate complex information and sort often conflicting information into *useful* and *distracting* and to rank/prioritise information.

Writing is required to the level of reading and interpreting technical information, developing and modifying plans and procedures and interpreting relevant regulatory requirements.

Numeracy is required to the level of analysing product/process performance data, interpreting process condition information and deriving useful information from technical brochures, papers and similar. Calculation will be required to assist this and to determine priorities for optimisation plans (ie benefit/cost or other quantitative criteria)

Evidence Guide

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

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

Competence must be demonstrated in the ability to analyse and evaluate current production performance, and develop and implement plans to optimise process systems.

While the technician is expected to take a lead technical role, and to demonstrate competence as defined above, optimisation is rarely undertaken by an individual alone and liaison with all relevant stakeholders is an expected part of this competency.

Where the assessee does not currently possess evidence of competency in *MSASUP390A Use structured problem solving tools*, it may be coassessed with this unit.

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

It is essential that the equipment/process/system be understood in depth and that the importance of critical material properties/settings/readings is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

Consistent performance should be demonstrated. For example, look to see that:

- non-routine problems are recognised and defined
- hazards are identified and controlled by applying the hierarchy of control

- possible causes of complex problems are identified based on experience and the use of analytical techniques in solving the problem, including identifying variations and cause, separating single problems from multiple problems and the recognition of recurring problems
- fundamental cause of process or equipment faults is determined
- corrective/preventative actions are developed to avoid recurrence of the problem and optimise the condition of the process, plant and equipment
- product quality and uniformity are maintained.

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

Competence also includes the ability to implement improvements within appropriate time constraints and in a manner relevant to the operation of the equipment, processes and systems.

Context of assessment

Competence in this unit may be assessed by:

- observation over time in a processing plant allowing for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.
- using a suitable simulation and/or a range of case studies/scenarios
- undertaking a specific project based in the plant
- a combination of these techniques.

Method of assessment

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit describes the work conducted by senior operators, team leaders or front line managers who optimise process systems as part of their work function. It includes all items of equipment and unit operations which form part of the production process of a complete area.

Typical problems will require the application of detailed operational and process knowledge over the entire production/manufacturing area, including the principles of operation of the equipment and the chemistry, physics, biology and/or biochemistry of the changes to materials occurring within that area.

All operations are performed in accordance with organisation procedures, licensing requirements, legislative requirements and industrial awards and agreements.

Procedures

All operations are performed in accordance with procedures. Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards. These may include or have been prepared from/to comply with:

- industry codes of practice
- materials safety data sheets
- equipment manuals
- equipment start up, operation and shut down procedures
- calibration and maintenance schedules
- quality manuals and procedures
- organisation recording and reporting procedures
- production and laboratory schedules
- material, production and product specifications.

Data/records

Historical data/records may include:

- hazard logs
- incident reports
- maintenance records
- product non-conformance reports
- production records.

Implementing change

Requirements to implement change may include:

- changes to procedures

- training of operators
- equipment modifications
- ensuring all HSE requirements are addressed.

Relevant/appropriate personnel

Relevant/appropriate personnel may include:

- managers
- OHS representatives and OHS committee.

Relevant information

Relevant information logged to include:

- modifications to plant or equipment
- modifications to procedures or practices.

Sources of information

Sources of information may include:

- hazard logs
- incident reports
- maintenance records
- work practices
- procedures
- industry journals
- equipment supplier information
- industry best practice information.

Health, Safety and Environment (HSE)

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

Unit Sector(s)

Not applicable.

MSAPMOPS401A Trial new process or product

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency typically applies to a technician in a plant who is taking a lead technical role in the trialling of a new product or the trialling of a new or significantly altered process. This competency does not apply to minor modifications to existing products or processes.

Similarly it does not apply to a technician or operator taking part in such trials, and/or who is following directions set by the technician, chemist, engineer, supervisor or manager.

The technician is expected to be a technical expert in that part of the plant/process where the trial is being conducted.

Application of the Unit

Application of this unit

The technician would be expected to operate and control all equipment required for the trial. Generally the technician would be part of a team during the trial, and would usually be working in conjunction with a process/product development expert such as a chemist or engineer. The technician is often the most technically competent member of an operational team. As such they may not have the 'hands on' role of operating items of equipment, but they are expected to have the competence to direct the operation of equipment as appropriate throughout the trial. At all times they would be liaising and cooperating with other members of the team.

Trialling refers to the scale-up and other development steps required to take a new product or process from its design/laboratory trials to full commercial operation on a plant. Trialling may be done on a pilot plant where available and/or on a full scale plant.

The technician would:

- identify and rectify operational problems within their scope
- analyse the trial, both while it is occurring and after completion, and suggest improvements
- be alert for indications of developing problems and take required action to ensure the trial remains safe to people, the environment and the plant.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Contribute to the selection of equipment/process conditions.	1.1 Liaise with appropriate technical expert(s). 1.2 Interpret properties of materials and desired product characteristics. 1.3 Interpret technical specifications/drawings of plant requirements. 1.4 Recommend equipment/ancillary equipment appropriate for the materials, products and conditions. 1.5 Recommend process conditions appropriate for the

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
	equipment, materials and product characteristics. 1.6 Recommend feed rates/order/condition appropriate to the process conditions, equipment, materials and product characteristics. 1.7 Ensure hazard identification and analysis procedures are completed, including consultation with stakeholders, and findings included in plan. 1.8 Ensure recommendations meet the identified need.
2. Prepare for trials.	2.1 Determine the availability of resources required such as materials, equipment, people and skills. 2.2 Estimate time required for trial. 2.3 Liaise with relevant stakeholders. 2.4 Schedule trial at a convenient time. 2.5 Develop documentation for the trial. 2.6 Identify potential hazards and required hazard control procedures by applying the hierarchy of control. 2.7 Determine clearance requirements and special safety and storage requirements. 2.8 Verify decisions with appropriate experts/stakeholders. 2.9 Ensure people with adequate skills are available for the trial.
3. Conduct test runs/trials	3.1 Ensure hazard controls are implemented prior to commencement. 3.2 Run trials. 3.3 Maintain communication with all relevant people. 3.4 Closely monitor critical parameters. 3.5 Recognise actual and potential problems. 3.6 Make adjustments to process conditions as required during trial. 3.7 Sample and test product as required. 3.8 Record and report performance data. 3.9 Ensure all materials, products and waste are handled correctly. 3.10 Leave plant in a condition suitable for routine production to recommence.

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
4. Evaluate results and identify modifications.	4.1 Interpret data from trial. 4.2 Identify factors which might be related to low rates or low charge amounts. 4.3 Recommend modifications and improvements required. 4.4 Develop and check standard operating procedure. 4.5 Complete documentation and report to appropriate personnel. 4.6 Ensure all relevant staff have required skill levels for the introduction of the new process.

Required Skills and Knowledge

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

Competence includes an understanding of the plant systems and all integral equipment involved in the trial to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the plant and describe the function of each
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- state the major design features of plant equipment, plant conditions and variables and the impact of these on the properties of materials passing through them
- describe the causes and remedies of common problems such as those selected in the Range Statement
- apply the hierarchy of control to minimise the risk of hazards identified
- describe methods of changing rate and the advantages and disadvantages of each
- describe methods of controlling other process variables and the advantages and disadvantages of each.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the plant system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- process material variations
- instrument failure/wrong reading
- electrical failure

- mechanical failure
- operational problem.

Language, literacy and numeracy requirements

This unit requires the ability to communicate and liaise with people at a range of levels about technical matters.

Reading is required to the level of interpreting technical specifications, manuals and procedures; and writing technical documentation such as specifications and procedures required for the trial.

Numeracy is required to the level of interpreting technical specifications and test results, analysing process data and determining required variations in process variables.

Evidence Guide

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

Overview of assessment

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Critical aspects

It is essential that competence is demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance should be demonstrated. For example, look to see that:

- hazards are identified and controlled
- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate and timely action is taken to ensure the safety and success of the trial
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context and method of assessment

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

Competence in this unit may be assessed:

- using a pilot plant or a production plant as appropriate
- using a range of scenarios/case studies and 'what ifs' as the stimulus with a walk-through forming part of the response
- using a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources
- using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge; and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit includes all items of equipment and unit operations which form part of the trial.

Liaison

Liaison with technical experts may (depending on trial requirements and company protocols) include one or more of:

- manufacturers
- chemists
- engineering personnel
- designers
- OHS advisors
- maintenance personnel
- potential customers.

Hazard analysis

Hazard analysis procedures may include:

- JSA/JHA (Job Safety Analysis/Job Hazard Analysis)
- hazard and operability (HAZOP) studies
- hazard analysis (HAZAN) studies
- other company specified procedures.

It is not expected that the candidate will be able to conduct technical hazard analysis procedures (such as HAZOP or HAZAN) but they should be able to interpret and use the outcomes of such analyses where relevant.

Hazards

Hazards may be determined from:

- materials safety data sheets (MSDSs)
- other relevant documentation such as hazard logs, incident reports
- company hazard identification procedures
- hazard analysis results
- standard operating procedures.

Waste handling

Waste handling may include:

- collection for re-use
- recycling
- disposal in accordance with health and environmental regulations.

Problems

Typical problems for the trial might include:

- mixing is poor
- materials do not behave as expected
- process/reaction does not proceed /proceeds too slowly
- process/reaction proceeds too quickly/runs away
- yield is low
- quality is out of specification
- process is unstable

- instrumentation is not sufficiently sensitive/too sensitive
- variable catalyst activity
- surging flow/pressure.

Health, Safety and Environment (HSE)

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Procedures

All operations are performed in accordance with procedures.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Unit Sector(s)

Not applicable.

MSAPMOPS404A Co-ordinate maintenance

Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This unit applies to employees who coordinate maintenance of a manufacturing facility. It applies to all sectors of the industry.

This competency is typically performed by experienced technicians, supervisors, maintenance coordinators or team leaders, working either independently or as part of a team.

Application of the Unit

Application of this unit

This competency applies to supervisors and technicians who are required to apply knowledge of equipment operating principles, service requirements and workplace production operations to the coordination of maintenance activities. The key factors are the coordination of maintenance activities to meet the objectives of restoring the plant/equipment condition, consistent with production requirements.

The technician will:

- identify and plan maintenance work consistent with production requirements
- interpret data and information on equipment
- develop and monitor workplans for the maintenance activities
- organise materials, consumables and personnel to meet the maintenance objectives
- check tools, equipment, materials and output for conformity to job requirements
- complete logs and reports.
-

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the evidence guide.
1. Plan maintenance.	1.1 Develop work plans for scheduled routine maintenance activities. 1.2 Develop maintenance plans for unscheduled maintenance activities. 1.3 Source maintenance providers (internal/external). 1.4 Develop costings for maintenance work. 1.5 Implement measures to control identified hazards in line with procedures and duty of care. 1.6 Document and record required production interruptions, processes and procedures. 1.7 Obtain clearances for the maintenance work.
2. Organise maintenance.	2.1 Schedule maintenance activities, with reference to production requirements and availability of resources. 2.2 Review available maintenance expertise and arrange appropriate training and assessment where necessary.

ELEMENT	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.
	2.3 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	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.
requirements.	<p>recommended maintenance schedule.</p> <p>3.2 Check fault and maintenance history to determine adequacy of current regime and special requirements.</p> <p>3.3 Determine criticality of machine to production/business.</p> <p>3.4 Develop maintenance schedule/requirements for machine.</p> <p>3.5 Liaise with all relevant stakeholders to ensure schedule is appropriate.</p> <p>3.6 Report outcome to appropriate personnel.</p>
4. Identify pneumatic/hydraulic control system problems.	<p>4.1 Categorise the types of machine malfunctions due to fluid power faults.</p> <p>4.2 Describe the effects on product quality of fluid power problems.</p> <p>4.3 Isolate possible faulty components from a circuit diagram and knowledge of the function of each component.</p>
5. Implement appropriate corrective action.	<p>5.1 Examine other possible faults.</p> <p>5.2 Shortlist possible fault causes.</p> <p>5.3 Conduct investigations of machine, products or data to determine most likely fault cause(s).</p> <p>5.4 Take appropriate action to ensure fault is rectified.</p> <p>5.5 Follow up on action to ensure completion in an appropriate time frame.</p> <p>5.6 Recheck after corrective action to ensure fault has been rectified.</p>

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.

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	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.
	<p>undertaken on the production/process equipment.</p> <p>2.3 Undertake site inspections to ensure that the work to be undertaken is in sequence and completed in a safe and coordinated manner.</p> <p>2.4 Identify hazards, and confirm with those undertaking the permitted work that control measures, as defined in the permit are established.</p>
3. Identify and action non-compliance.	<p>3.1 Identify conditions of active permits.</p> <p>3.2 Report and record incidents of non-compliance according to procedures.</p> <p>3.3 Take corrective action upon incidences of non-compliance with permit conditions through the withdrawal or suspension of the issued permit.</p>
4. Confirm compliance with permit.	<p>4.1 Complete checklists in accordance with standard <u>procedures</u>.</p> <p>4.2 Document and communicate findings to appropriate personnel.</p>

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	<p>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:</p> <ul style="list-style-type: none">• 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:
<p>This competency includes the following skills:</p> <ul style="list-style-type: none"> • observation • decision making • communication • leadership
Required knowledge:
<p>Competence in this unit includes the following knowledge:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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</p>

EVIDENCE GUIDE

	also include the use of case studies/scenarios and role plays.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p> <p>Competence must be demonstrated in the ability to specify the requirements and then select the best solution to meet the necessary and desirable requirements.</p>
Context of and specific resources for assessment	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.
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.
------------------------------------	--

RANGE STATEMENT	
Context	<p>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:</p> <ul style="list-style-type: none"> • excavation • hot work • confined space • other relevant permits. <p>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.</p> <p>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.</p> <p>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.</p>
Incident response	<p>The required incident response may include:</p> <ul style="list-style-type: none"> • first response to fire • some initial rescues • first aid/CPR • other responses <p>These responses are not included in this units of competency but are the subject of their own unit of competency.</p>
Health, safety and environment (HSE)	<p>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.</p>

Unit Sector(s)

Unit Sector	
--------------------	--

Competency field

Competency Field

Co-requisite units

Co-requisite Units	MSAPMPER200C	Work in accordance with an issued permit
--------------------	--------------	--

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	<p>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:</p> <ul style="list-style-type: none">• 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	<i>MSAPMPER300C</i>	<i>Issue work permits</i>
----------------------------	---------------------	---------------------------

Employability Skills Information

Employability Skills	This unit contains employability skills.
-----------------------------	--

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Assess 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	<p>This competency covers the issue of any and all work permits. Permits are called clearances by some organisations. The types of permit include:</p> <ul style="list-style-type: none"> • cold work • excavation • vehicle entry • minor repairs • working at heights • hot work • confined space • electrical • increased hazard • other relevant permits. <p>Requirements identified on the permit may include testing of atmospheric conditions, ventilation and control measures such as isolation, barriers, tag</p>

RANGE STATEMENT	
	<p>out/lockout signs, communications, incident response.</p> <p>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.</p> <p>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.</p>
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	<p>Auditing of permits includes all of:</p> <ul style="list-style-type: none"> • 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	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
despatch.	assembling and completing orders. 3.2 Select and check goods for despatch. against product/material knowledge, labels and other identification systems. 3.3 Sort, assemble and consolidate products as necessary. 3.4 Secure order and place in storage areas, in accordance with schedule. 3.5 Check order against despatch schedule and order form.
4. Complete materials movement records.	4.1 Complete materials movement records (in or out). 4.2 Update records as required. 4.3 Complete other paperwork and records as required.

Required Skills and Knowledge

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

Knowledge and understanding of the materials handling processes and requirements sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge is required of the product/material, its properties and uses sufficient for correct receipt, storage and despatching. Knowledge of the relevant OHS and environmental requirements is required along with an ability to implement them in a manner which is relevant to the materials handled.

Competence includes the ability to apply and/or describe:

- product/material knowledge
- inventory and ordering systems
- transport requirements and restrictions for products/materials
- correct OHS procedures
- storage/handling principles and procedures
- material hazard properties and their implications for safe handling and storage
- significance of material to customers; transport requirements and restrictions for materials
- plan own work, including predicting consequences and identifying improvements

- identify and describe own role and role of others involved directly in the processing of orders and despatching of products
- use PPE, safely handle products and materials, read relevant safety information and apply safety precautions appropriate to the task
- distinguish between causes of problems such as product requirements and job priority as relevant to the practical completion of the job.

Language, literacy and numeracy requirements

This unit requires the ability to read and interpret typical product specifications, job sheets, procedures, material labels and safety information as provided to operators.

Writing is required to the level of completing workplace forms.

Basic numeracy is required, e.g. to determine that two 25 kg bags are needed to make up a requirement for 50 kg.

Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, required skills and knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment

A holistic approach should be taken to the assessment.

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

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

It is essential that competence is demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

Consistent performance should be demonstrated. For example, look to see that:

- packaging standards are met consistently
- procedures and work instructions are read and interpreted correctly
- potential problems are recognised and action is taken (ie, the problem is fixed or reported)
- action is taken to ensure problems are dealt with in a timely manner
- problems caused by product/material issues are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.
- effective communication between team members, supervisors and other staff is maintained.

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

Assessment method and context

Assessment will occur using industrial equipment and will be undertaken in a work-like environment.

Competence in this unit may be assessed:

- by observation over time on a processing plant
- by using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

Range Statement

RANGE STATEMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This competency covers the handling of a limited range of products/materials and their moving into and out of a plant/storage. It is NOT intended for people who, as a major function, operate a warehouse. The appropriate Transport and Distribution competencies should be used here.

This competency may require the operation of forklift trucks or other regulated load shifting devices which are NOT included in this competency, and so would be a co-requisite competency.

The terms order request, documentation, labels, transportation requirements 'paperwork' and 'records' mean any and all relevant information and data whether it is manual, paper based, electronic or verbal, either in person or by phone/radio.

This competency does not imply that moving materials into and from storage/plant are conducted equally, or even using similar techniques. Customers may be internal or external and the loading/unloading of products/materials may mean getting them onto/off a truck or simply from/to the next department.

Procedures

All operations are performed in accordance with procedures.

Procedures include all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Tools and equipment

This competency includes use of equipment and tools such as:

- mobile plant/fork lifts
- manual handling equipment
- hand tools
- shrink wrappers
- tape machine labellers
- loose bulk packing equipment.
- computers, bar code readers
- bag filling equipment
- pallets
- wrapping machines
- personal protective equipment (PPE)
- distribution equipment, including A-frames, stillages, containers, elevated platforms and communication equipment.

Hazards

Typical hazards include:

- inappropriate movements and postures
- physical and atmospheric hazards of materials
- height or depth of storage receptacles
- stationary and moving machinery, parts or components
- noise, light, energy sources
- humidity, air temperature, radiant heat
- manual handling hazards.

Problems

'Respond to routine problems' means 'apply known solutions to a limited range of predictable problems'. Typical process and product problems may include:

- special storage requirements including moisture and contamination control
- handling of incomplete loads (either in or out)

- handling of materials which do not meet specifications
- conflicting priorities
- incomplete or incorrect paperwork.
- product requirements
- job priority
- product/material variations.

Variables

Key variables to be monitored include:

- types of products or materials to be received/despached
- handling heights
- types of equipment
- types of workplace documentation
- atmospheric conditions.
-

Unit Sector(s)

Not applicable.

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.
	<p>reference materials, including materials safety data sheets and equipment instructions.</p> <p>2.5 Take appropriate measures to minimise risks from the identified hazards.</p> <p>2.6 Establish the location and function of equipment emergency stops and ensure guards are in place.</p> <p>2.7 Identify and note requirements for checking:</p> <ul style="list-style-type: none"> - materials inputs and outputs - ancillary supplies and equipment - product quality requirements for the relevant process stage(s). <p>2.8 Obtain or arrange access to any required supplementary equipment for product quality testing or routine lubrication and adjustment.</p>
3. Maintain operations.	<p>3.1 Check process operations, noting product quality, production outputs and waste, in accordance with workplace practices.</p> <p>3.2 Collect product outputs, check for conformity, make adjustments to the equipment (where appropriate) and store product.</p> <p>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).</p> <p>3.4 Check readouts against standard statistical process information and enter production data into the control system.</p> <p>3.5 Clean up equipment and work area and manage waste in accordance with workplace procedures.</p>
4. Identify product quality requirements.	<p>4.1 Monitor process and note conditions which may affect product quality standards.</p> <p>4.2 Report process variations within workplace procedures.</p> <p>4.3 Note and implement authorised changes in standard operating procedures and specifications.</p>

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

Release 2 - Error in title of prerequisite unit corrected - Equivalent. No change to the prerequisite.

Unit Descriptor

Unit descriptor

This competency covers the ability to identify, monitor and participate in strategies to improve production efficiencies to meet set targets. It applies to all employees who are required to provide input into process improvement initiatives. The competency is typically performed by an experienced operator, team leader or supervisor.

Application of the Unit

Application of this unit

This unit covers the improvement of production such as occurs in the workplace but does not cover maximisation of process/equipment efficiencies undertaken as part of the operator's normal role, which is covered in the relevant operation/production competency unit.

The plant operator would:

- identify variances from production targets
- monitor performance against targets
- participate in and implement areas for improving process efficiencies.

Generally the plant operator would be part of a team in developing strategies to improve process efficiencies and may be expected to perform all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

MSAPMSUP200A Achieve work outcomes

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance Criteria describe the required performance needed to demonstrate achievement of the Element. Assessment of performance is to be consistent with the Evidence Guide.
1. Identify production performance.	1.1 Identify production targets for work area and work roles taking account of OHS. 1.2 Identify techniques used to measure production performance against targets/standards. 1.3 Record production performance in accordance with enterprise procedures.
2. Recognise issues that effect production process efficiencies.	2.1 Identify issues affecting output and quality. 2.2 Identify potential/actual sources of wastage. 2.3 Identify hazards and required controls associated with the process. 2.4 Identify strategies to minimise production inefficiencies without sacrificing OHS.
3. Monitor and measure performance against targets.	3.1 Monitor performance of process/equipment/raw material usage against targets. 3.2 Identify variations from targets and divergence from trends. 3.3 Use appropriate techniques to monitor actual performance against target. 3.4 Identify factors inhibiting performance.

ELEMENT 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. 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	<p>Performance Criteria describe the required performance needed to demonstrate achievement of the Element.</p> <p>Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the Range Statement.</p> <p>Assessment of performance is to be consistent with the Evidence Guide.</p>

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	<p>Performance Criteria describe the required performance needed to demonstrate achievement of the Element.</p> <p>Where bold italicised text is used, further information is detailed in the required skills and knowledge and/or the Range Statement.</p> <p>Assessment of performance is to be consistent with the Evidence Guide.</p>
1. Identify resources to meet production requirements.	<p>1.1 Determine demand for product.</p> <p>1.2 Access and verify information on orders, stocks and delivery.</p> <p>1.3 Determine material requirements.</p> <p>1.4 Determine human resource requirements.</p> <p>1.5 Determine health, safety or environment issues in meeting requirements.</p>
2. Develop schedules	<p>2.1 Determine production priorities.</p> <p>2.2 Identify production opportunities ('windows').</p> <p>2.3 Develop production schedules in accordance with procedures taking account of safety requirements.</p> <p>2.4 Communicate and distribute production schedules to appropriate personnel.</p>
3. Monitor production schedules.	<p>3.1 Monitor production output against schedule.</p> <p>3.2 Identify variations between production and schedule.</p> <p>3.3 Record operational variation and discuss with appropriate personnel.</p> <p>3.4 Identify possible cause of variation.</p>

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: <ul style="list-style-type: none">• 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	<p>This unit of competency is applicable to senior technical officers and laboratory supervisors working in all industry sectors.</p> <p>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'.</p>
--------------------------------	---

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	<p>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.</p> <p>Manufacturing</p> <p>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.</p> <p>Environmental</p> <p>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.</p> <p>Food processing</p> <p>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</p>

EVIDENCE GUIDE

	<p>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.</p>
--	--

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and 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	<p>Records may include:</p> <ul style="list-style-type: none"> • 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	<p>Communication may include:</p> <ul style="list-style-type: none"> • computer generated communication • customers, stakeholders, external authorities and project team • reports, briefs, minutes, letters, oral briefings, advice and conversations and telephone calls
Resources	<p>Resources may include:</p> <ul style="list-style-type: none"> • personnel • budget • equipment, materials and facilities • computer project planning programs
Occupational health and safety (OHS) and environmental management requirements	<p>OHS and environmental management requirements:</p> <ul style="list-style-type: none"> • 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	<p>This unit of competency is applicable to production operators, field assistants and laboratory assistants in all industry sectors.</p> <p>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'.</p>
--------------------------------	--

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
	<p>2.6. Record all labelling information in accordance with enterprise/legal traceability requirements</p> <p>2.7. Record sample appearance, environmental conditions and any other factors that may impact on sample integrity</p> <p>2.8. Replace security devices, such as locks and covers as required</p>
3. Finalise sampling	<p>3.1. Follow enterprise procedures for the cleaning/decontamination of equipment and vehicle as necessary</p> <p>3.2. Check all equipment, materials and samples against inventory and stow for safe transport</p> <p>3.3. Liaise with relevant personnel to restore normal production and/or services as necessary</p> <p>3.4. Maintain integrity of samples during transportation</p> <p>3.5. Deliver samples to the required collection point and complete all documentation to ensure traceability</p> <p>3.6. On return, check and document serviceability of equipment before storage</p>
4. Maintain a safe work environment	<p>4.1. Use established work practices and personal protective equipment to ensure personal safety and that of others</p> <p>4.2. Minimise environmental impacts of sampling and generation of waste</p> <p>4.3. Dispose of all waste in accordance with enterprise procedures</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- 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	<p>workplace or simulated workplace environment.</p> <p>This unit of competency may be assessed with:</p> <ul style="list-style-type: none"> • <i>MSL972001A Conduct routine site measurements.</i> <p>Resources may include:</p> <ul style="list-style-type: none"> • variety of sample types • sampling procedures • a selection of sampling containers, equipment and documentation.
Method of assessment	<p>The following assessment methods are suggested:</p> <ul style="list-style-type: none"> • 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. <p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required.</p> <p>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.</p>
This competency in practice	<p>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.</p> <p>Construction materials testing</p> <p>A laboratory assistant takes daily tar samples from the</p>

EVIDENCE GUIDE

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

EVIDENCE GUIDE

	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	
	<ul style="list-style-type: none"> • 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	<p>Site hazards may include:</p> <ul style="list-style-type: none"> • 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	<p>Safety procedures may include:</p> <ul style="list-style-type: none"> • 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	
	<p>equipment</p> <ul style="list-style-type: none"> • machinery guards • signage, barriers, service isolation tags, traffic control and flashing lights • lockout and tag-out procedures
Types of samples	<p>Types of samples may include:</p> <ul style="list-style-type: none"> • 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	<p>Materials sampled may include:</p> <ul style="list-style-type: none"> • 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	<p>Sampling tools and equipment may include:</p> <ul style="list-style-type: none"> • 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	<p>Maintenance of integrity of samples could include:</p> <ul style="list-style-type: none"> • 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	<p>Services may include:</p> <ul style="list-style-type: none"> • water supply, gas and electricity • telecommunications • irrigation, stormwater and drainage systems • production plant
Minimising environmental impacts	<p>Minimising environmental impacts may involve:</p> <ul style="list-style-type: none"> • 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	<p>OHS and environmental management requirements:</p> <ul style="list-style-type: none"> • 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

	<ul style="list-style-type: none"> 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	<p>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.</p> <p>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'.</p>
--------------------------------	---

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
	<p>4.2. Conduct tests in accordance with enterprise procedures</p> <p>4.3. Record data in accordance with enterprise procedures</p> <p>4.4. Perform calculations on data as required</p> <p>4.5. Identify and report out of specification or atypical results promptly to appropriate personnel</p> <p>4.6. Shut down equipment in accordance with operating procedures</p>
5. Maintain a safe work environment	<p>5.1. Use established safe work practices and personal protective equipment to ensure personal safety and that of other laboratory personnel</p> <p>5.2. Minimise the generation of wastes and environmental impacts</p> <p>5.3. Ensure safe disposal of laboratory and hazardous wastes</p> <p>5.4. Clean, care for and store equipment and reagents as required</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- interpreting enterprise procedure or standard methods accurately
- using safety information, such as material safety data sheets (MSDS) and performing procedures safely
- checking test equipment before use
- completing all tests within required timeline without sacrificing safety, accuracy or quality
- calculating, recording and presenting results accurately and legibly
- maintaining security, integrity and traceability of all samples, data/results and documentation
- cleaning and maintaining equipment

Required knowledge

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge includes:

- concepts of metrology
- the international system of units (SI)
- purpose of test
- principles of the standard method
- pre-use equipment checks
- relevant standards/specifications and their interpretation
- sources of uncertainty in measurement and methods for control
- enterprise and/or legal traceability requirements
- interpretation and recording of test result, including simple calculations
- procedures for recognition/reporting of unexpected or unusual results
- relevant health, safety and environment requirements

Evidence Guide

EVIDENCE GUIDE

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

Overview of assessment

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

Assessors should ensure that candidates can:

- accurately interpret enterprise procedures or standard methods
- complete all tests within the required timeline without sacrificing safety, accuracy or quality
- demonstrate close attention to the accuracy and precision of measurements and the data obtained
- maintain the security, integrity and traceability of all samples, data/results and documentation.

Context of and specific resources for assessment

This unit of competency is to be assessed in the workplace or simulated workplace environment.

This unit of competency may be assessed with:

- *MSL922001A Record and present data.*

Resources may include:

- standard laboratory equipped with appropriate

EVIDENCE GUIDE	
	<p>equipment standards and materials</p> <ul style="list-style-type: none"> • enterprise procedures and standard methods, and equipment manuals • MSDS.
Method of assessment	<p>The following assessment methods are suggested:</p> <ul style="list-style-type: none"> • 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. <p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required.</p> <p>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.</p>
This competency in practice	<p>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.</p> <p>Manufacturing</p> <p>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</p>

EVIDENCE GUIDE

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

EVIDENCE GUIDE

	<p>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.</p>
--	---

Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and 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	
	<ul style="list-style-type: none"> • 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	<p>Concepts of metrology may include:</p> <ul style="list-style-type: none"> • 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	<p>Preparation of samples may include:</p> <ul style="list-style-type: none"> • 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	<p>Typical tests carried out by laboratory/field assistants may include:</p> <ul style="list-style-type: none"> • visual/optical tests of appearance, colour, texture, identity, turbidity, refractive index (alcohol content and Baume/Brix) • physical tests: <ul style="list-style-type: none"> • density, specific gravity and compacted

RANGE STATEMENT	
	<ul style="list-style-type: none"> density • moisture content and water activity • particle size, particle shape and size distribution • chemical tests: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • pH, oxygen reduction potential (ORP), dissolved oxygen (DO) and (EC) • E coli using test kits • surface hygiene/presence of microbes • packaging tests: <ul style="list-style-type: none"> • tearing resistance, bursting strength and impact resistance • permeability and/or leakage • mechanical tests: <ul style="list-style-type: none"> • Emerson class • concrete slump
Measurements	<p>Measurements may include:</p> <ul style="list-style-type: none"> • 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	<p>Common measuring equipment may include:</p> <ul style="list-style-type: none"> • dimension apparatus • DO and EC • analogue and digital meters and charts/recorders

RANGE STATEMENT	
	<ul style="list-style-type: none"> • 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	<p>Hazards may include:</p> <ul style="list-style-type: none"> • 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	<p>Enterprise controls to address hazards may include:</p> <ul style="list-style-type: none"> • 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	
	<ul style="list-style-type: none"> • 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	<p>Minimising environmental impacts may involve:</p> <ul style="list-style-type: none"> • 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	<p>OHS and environmental management requirements:</p> <ul style="list-style-type: none"> • 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

Release 2 - wording clarified in Required Skills and Evidence Guide. Equivalent outcomes.

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

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

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the	Performance criteria describe the performance needed to
-----------------------	---

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

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Interpret and schedule test requirements	<p>1.1. Review test request to identify samples to be tested, test method and equipment/instruments involved</p> <p>1.2. Identify hazards and enterprise control measures associated with the sample, preparation/test methods and/or equipment</p> <p>1.3. Plan work sequences to optimise throughput of multiple samples, if appropriate</p>
2. Receive and prepare samples	<p>2.1. Log samples using standard operating procedures (SOPs)</p> <p>2.2. Record sample description, compare with specification and note and report discrepancies</p> <p>2.3. Prepare samples and standards in accordance with physical testing requirements</p> <p>2.4. Ensure traceability of samples from receipt to reporting of results</p>
3. Check equipment before use	<p>3.1. Set up equipment/instruments in accordance with test method requirements</p> <p>3.2. Perform pre-use and safety checks in accordance with relevant enterprise and operating procedures</p> <p>3.3. Identify faulty or unsafe components and equipment and report to appropriate personnel</p> <p>3.4. Check equipment calibration using specified procedures, if applicable</p> <p>3.5. Quarantine out of calibration equipment/instruments</p>
4. Test samples to determine physical properties	<p>4.1. Operate equipment/instruments in accordance with test method requirements</p> <p>4.2. Perform tests/procedures on all samples and standards, if appropriate, in accordance with specified methods</p> <p>4.3. Shut down equipment/instruments in accordance with operating procedures</p>

ELEMENT	PERFORMANCE CRITERIA
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 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

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

Required skills

Required skills include:

- using equipment/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
- troubleshooting basic equipment/method
- preparing calibration graphs, if required, 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
- basic equipment/method troubleshooting procedures
- enterprise and/or legal traceability requirements
- relevant health, safety and environment requirements

Evidence Guide

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

<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Assessors should ensure that candidates can:</p> <ul style="list-style-type: none"> • interpret test methods/procedures accurately • prepare and test samples in accordance with specified methods • ensure equipment/instrumentation is within calibration before use • 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
--	--

	<p>relevant conclusions</p> <ul style="list-style-type: none"> • 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	<p>This unit of competency is to be assessed in the workplace or simulated workplace environment.</p> <p>This unit of competency may be assessed with:</p> <ul style="list-style-type: none"> • <i>MSL924001A Process and interpret data.</i> <p>Resources may include:</p> <ul style="list-style-type: none"> • standard laboratory equipped with appropriate test equipment/instruments, standards and materials • enterprise procedures and standard methods.
Method of assessment	<p>The following assessment methods are suggested:</p> <ul style="list-style-type: none"> • 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. <p>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.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</p>

	<p>Access must be provided to appropriate learning and/or assessment support when required.</p> <p>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.</p>
This competency in practice	<p>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.</p> <p>Manufacturing</p> <p>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 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.</p> <p>Food processing</p> <p>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.</p>

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work

environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

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	<p>Standards, codes, procedures and/or enterprise requirements may include:</p> <ul style="list-style-type: none"> • Australian and international standards, such as: <ul style="list-style-type: none"> • AS ISO 1000-1998 The international system of units (SI) and its application • AS ISO 17025-2005 General requirements for the competence of testing and calibration laboratories • AS/NZS 2243 Set:2006 Safety in laboratories set • AS/NZS ISO 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	<p>Physical principles and concepts underpinning the test/procedure may include:</p> <ul style="list-style-type: none"> • 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

	<ul style="list-style-type: none"> 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 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	<p>Preparation of samples may include processes, such as:</p> <ul style="list-style-type: none"> drying, washing, grinding, sieving, melting and moisture conditioning cutting, trimming or machining of test specimens, etching
Physical tests and procedures	<p>Physical tests and procedures may include:</p> <ul style="list-style-type: none"> precise measurement of position, orientation and dimensions: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> moisture/density relationship compaction loose and compacted density thermal tests: <ul style="list-style-type: none"> 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)

	<p>content)</p> <ul style="list-style-type: none"> • drying times • thermal stability of products • optical tests: <ul style="list-style-type: none"> • flatness and surface finish • refractive index • optical rotation • transmission/absorption of filters • colour matching of products • acoustic tests: <ul style="list-style-type: none"> • absorption, reflection and transmission • intensity, attenuation and loudness (dB) • amplitude and frequency • electrical tests: <ul style="list-style-type: none"> • conductance, resistance and insulation • temperature dependence of dielectrics • magnetic tests: <ul style="list-style-type: none"> • permeability • retentivity, hysteresis loss and coercivity • intrinsic induction
Test and sample preparation equipment/materials	<p>Test and sample preparation equipment/materials may include:</p> <ul style="list-style-type: none"> • 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	<p>Tests may include methods for:</p> <ul style="list-style-type: none"> • control of starting materials, in-process materials and finished products • investigation of sources of construction materials • basic troubleshooting of enterprise processes

Hazards	<p>Hazards may include:</p> <ul style="list-style-type: none"> • 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	<p>Hazard control measures may include:</p> <ul style="list-style-type: none"> • 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	<p>Records may include:</p> <ul style="list-style-type: none"> • test and calibration results • equipment use, maintenance and servicing history • faulty or unsafe equipment

Occupational health and safety (OHS) and environmental management requirements	<p>OHS and environmental management requirements:</p> <ul style="list-style-type: none"> 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)

Competency field	
Unit sector	Testing

Competency field

Competency field	
-------------------------	--

Co-requisite units

Co-requisite units		

PMAOPS101C Read dials and indicators

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers making (or taking) readings/measurements in a variety of sites and locations, using common types of plant instrumentation. It also covers recording measurement results in a prescribed format, according to procedures and with the appropriate level of detail included in all reports.
------------------------	--

Application of the Unit

Application of the unit	In a typical scenario an operator patrols the plant taking a range of readings to complete logs and check on the operation of the plant. The operator needs to interpret the display on the instrument and record the appropriate reading. As part of this process, they check that the instrument is within calibration (where appropriate) and make a judgement as to whether the reading is 'reasonable' or whether some action needs to be taken.
--------------------------------	---

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	
---------------------------	--

Employability Skills Information

Employability skills	This unit contains employability skills.
-----------------------------	--

Elements and Performance Criteria Pre-Content

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

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Contribute to controlling hazards in work area.	1.1. Identify hazards in work area 1.2. Take appropriate action to control risks according to procedures.
2. Identify appropriate measuring device readings.	2.1. Explain the need for calibration and where appropriate, confirm the calibration of the measuring device 2.2. Select appropriate units on the measuring device 2.3. Select appropriate scale(s) on the measuring device.
3. Perform measurements.	3.1. Identify the range of results that could be obtained 3.2. Identify and take account of relevant external factors 3.3. Perform measurements using appropriate techniques 3.4. Identify measurements outside the range of expected results 3.5. Take action on measurements outside expected range according to procedures.
4. Record results	4.1. Record readings accurately in the appropriate format 4.2. Record the results to the appropriate level of detail.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
<ul style="list-style-type: none"> 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	
	<p>and the appropriate priority for response for such readings.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
Context of and specific resources for assessment	<p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with units related to HSE.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.</p>

Range Statement

RANGE STATEMENT
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in</p>

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	<p>This unit applies to reading process instrumentation in any plant or related situation.</p> <p>Readings may need to be made at heights, in wet or restricted conditions, or close to hot or moving equipment.</p>
Dials and indicators	<p>Typical dials and indicators include (select relevant items):</p> <ul style="list-style-type: none"> • analogue dials, such as: <ul style="list-style-type: none"> • pressure gauge • rev counter • temperature dial • digital readouts, such as: <ul style="list-style-type: none"> • pH meter • temperature probe • ammeter • flow meter • weigh scales.
Calibration checks	<p>Calibration checks could include:</p> <ul style="list-style-type: none"> • 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	<p>Appropriate action includes:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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:</p> <ul style="list-style-type: none">• <i>PMAOPS202A Operate fluid mixing equipment</i>• <i>PMCOPS203A Operate grinding equipment</i> <p>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.</p>
--------------------------------	---

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	<p>This competency is typically performed by operators, weighers, mixers or stores personnel, and includes the following tasks (select relevant items):</p> <ul style="list-style-type: none"> • 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	<p>Typical examples of preparation required might include (select relevant items):</p> <ul style="list-style-type: none"> • 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	<p>Equipment may include:</p> <ul style="list-style-type: none"> • buckets • stirring paddle • propeller or drum mixers • delumpers • hammers or axes • measuring equipment including scales, flow meters and graduated vessels • personal protective equipment
Documentation	<p>Documentation may include:</p> <ul style="list-style-type: none"> • 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	<p>Materials may include:</p> <ul style="list-style-type: none"> • raw materials • packaging materials • consumables.
Problems	<ul style="list-style-type: none"> • Typical problems are restricted to responding in a routine, predetermined manner as specified in the procedures. • All operations are performed to procedures.
Procedures	<p>Procedures may be written, verbal, computer-based or in some other form. They include:</p> <ul style="list-style-type: none"> • all work instructions

RANGE STATEMENT	
	<ul style="list-style-type: none"> • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. <p>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.</p>
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	<p>Material hazards and handling procedures may be identified from label</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>This includes an understanding of the process and all OHS requirements including emergency situations.</p> <p>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:</p> <ul style="list-style-type: none">• 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. <p>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.</p>
--------------------------------	---

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
	<p>3.2. Identify the status of individual pieces of equipment from the control panel and use information to identify potential faults</p> <p>3.3. Interpret alarms and prioritise steps to ensure control of system is maintained</p> <p>3.4. Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics</p> <p>3.5. Make required set point/output changes to meet plant and process requirements</p> <p>3.6. Take other appropriate action as required</p> <p>3.7. Record process variations/irregularities in accordance with procedures.</p>
4. Facilitate planned and unplanned process start-ups and shutdowns	<p>4.1. Respond to all alarms and take appropriate action</p> <p>4.2. Maintain coordination with all outside services and operations in order to assist in the correct identification and reporting of faults</p> <p>4.3. Conduct planned start-up and shutdown processes to procedures</p> <p>4.4. Conduct unplanned start-up and shutdown processes to procedures</p> <p>4.5. Communicate with all operational areas and personnel affected by unplanned events to ensure safety is maintained during the process</p> <p>4.6. Implement all required and stated emergency responses and ensure the outcomes of these responses are communicated to all affected areas</p> <p>4.7. Log all required information for further action to provide a historical record of all events.</p>

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

EVIDENCE GUIDE

	<p>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.</p> <p>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.</p> <p>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</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>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</p>

EVIDENCE GUIDE	
	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	<p>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.</p> <p>In a major hazard facility, it may be appropriate to assess this unit concurrently with:</p> <ul style="list-style-type: none"> • <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	
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. 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.</p>	
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	<p>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):</p> <ul style="list-style-type: none"> • plant items requiring only simple control

RANGE STATEMENT	
	<ul style="list-style-type: none"> • 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. <p>Typical problems for your plant may include:</p> <ul style="list-style-type: none"> • 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	<p>Appropriate action includes:</p> <ul style="list-style-type: none"> • 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)	<p>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.</p>

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	<p>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.</p> <p>The operations technician would:</p> <ul style="list-style-type: none">• 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 <p>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.</p>
--------------------------------	--

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
	<p>system by applying systems knowledge</p> <p>3.2. Identify the status of individual pieces of equipment from the control panel and use information to identify potential faults</p> <p>3.3. Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics</p> <p>3.4. Record process variations/irregularities to procedures.</p>
4. Control process variations and monitor operations.	<p>4.1. Use historical data to assist the identification of problems</p> <p>4.2. Process available information to identify potential faults</p> <p>4.3. Undertake required set point/output changes to meet plant and process requirements</p> <p>4.4. Optimise plant operating conditions in accordance with guidelines</p> <p>4.5. Adjust production in response to test results and control panel information</p> <p>4.6. Monitor key process and environmental variables and take appropriate action</p> <p>4.7. Adjust controller settings in accordance with procedures</p> <p>4.8. Use fine tuning software as appropriate</p> <p>4.9. Coordinate with up stream and downstream units as appropriate</p> <p>4.10. Record adjustments and variations to specifications/schedules</p> <p>4.11. Communicate to appropriate personnel as required.</p>
5. Facilitate planned and unplanned process start-ups and shut-downs.	<p>5.1. Select and apply procedures to planned startup and shutdown processes</p> <p>5.2. Select and apply procedures to unplanned shutdown processes</p> <p>5.3. Implement all required emergency responses</p> <p>5.4. Communicate necessary information to all personnel affected by events</p> <p>5.5. Log all required information.</p>
6. Respond to alarms or out of specification conditions.	<p>6.1. Identify system(s) affected by the alarm or condition</p> <p>6.2. Interpret alarms and prioritise actions to be taken</p> <p>6.3. Take appropriate action to respond to the alarm or</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>incident</p> <p>6.4. Deal with any out of specification material in accordance with procedures</p> <p>6.5. Communicate the problem/solution to appropriate personnel</p> <p>6.6. Record the information as required</p> <p>6.7. Provide details of the alarm and action taken to the next shift at change over</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
<p>Required skills</p> <p>Competence includes the ability to distinguish between causes of problems/alarms/fault indications such as:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
<p>Required knowledge</p> <p>The knowledge referred to in the Evidence Guide for this unit includes:</p> <ul style="list-style-type: none"> • 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

	<p>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.</p> <p>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.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
Context of and specific resources for assessment	<p>Assessment will require access to a process control system over an extended period of time, or a suitable</p>

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	
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold 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.</p>	
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	<p>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):</p> <ul style="list-style-type: none"> • process control systems, eg Distributed Control Systems • personal computers • printers • fire and gas detection/protection systems • emergency shutdown systems • communications systems. <p>Typical problems for your plant may include:</p> <ul style="list-style-type: none"> • loss of power/utilities • analysing failure modes

RANGE STATEMENT	
	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • emergency, including emergency shut down • partial or complete controller failure.
Other problems	Other problems includes: <ul style="list-style-type: none"> • problem solving control functions
Appropriate action	Appropriate action includes: <ul style="list-style-type: none"> • 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	<p>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:</p> <ul style="list-style-type: none">• damage to/wear of tower trays• internal leaks of heat exchangers• collapse of/channelling in tower/column/vessel packing <p>The technician would:</p> <ul style="list-style-type: none">• clarify the problem• analyse problem cause(s)• recommend a solution to the problem. <p>Generally the technician would work alone for this unit, although the ability to communicate with all internal and external stakeholders is vital.</p>
--------------------------------	--

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	<p>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.</p> <p>The operations technician would:</p> <ul style="list-style-type: none">• 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 <p>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.</p>
--------------------------------	--

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
	<p>potential faults</p> <p>2.3.Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics</p> <p>2.4.Determine the overall operating effectiveness of the plant area related to the required targets for the area</p> <p>2.5.Record process variations/irregularities to procedures.</p>
3. Control process variations and monitor operations.	<p>3.1.Use historical data to assist the identification of problems</p> <p>3.2.Process available information to identify potential faults</p> <p>3.3.Undertake required set point/output changes to meet plant area and process requirements</p> <p>3.4.Adjust production in response to test results and control panel information</p> <p>3.5.Monitor key process and environmental variables and take appropriate action</p> <p>3.6.Adjust controller settings in accordance with procedures</p> <p>3.7.Use advanced control features as appropriate</p> <p>3.8.Optimise entire plant area in accordance with guidelines</p> <p>3.9.Undertake calibration operations as appropriate</p> <p>3.10. Coordinate with stakeholders external to the plant area as appropriate</p> <p>3.11. Record adjustments and variations to specifications/schedules</p> <p>3.12. Communicate to appropriate personnel as required.</p>
4. Facilitate planned and unplanned process start-ups and shut-downs.	<p>4.1.Select and apply procedures to planned startup and shutdown processes</p> <p>4.2.Select and apply procedures to unplanned shutdown processes</p> <p>4.3.Implement all required emergency responses</p> <p>4.4.Communicate necessary information to all personnel affected by events</p> <p>4.5.Log all required information.</p>
5. Respond to alarms or out of specification conditions.	<p>5.1.Identify system(s) affected by the alarm or condition</p> <p>5.2.Interpret alarms and prioritise actions to be taken</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>5.3. Respond to the alarm or incident by following procedures</p> <p>5.4. Deal with any out of specification material in accordance with procedures</p> <p>5.5. Communicate the problem/solution to appropriate personnel</p> <p>5.6. Record the information as required</p> <p>5.7. Provide details of the alarm and action taken to the next shift at change over</p> <p>5.8. Follow the incident up see that appropriate action has been taken.</p>
6. Control hazards.	<p>6.1. Identify hazards in the production/processing work area</p> <p>6.2. Assess the risks arising from those hazards</p> <p>6.3. Implement measures to control risks in line with procedures and duty of care</p>
7. Resolve other problems within scope of responsibility.	<p>7.1. Identify possible problems in equipment, control systems or process</p> <p>7.2. Determine problems needing action</p> <p>7.3. Determine possible fault causes</p> <p>7.4. Rectify problem using appropriate solution within area of responsibility</p> <p>7.5. Follow initiated items through until final resolution has occurred</p> <p>7.6. Report problems outside area of responsibility to designated person.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence includes the ability to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction

REQUIRED SKILLS AND KNOWLEDGE

- mechanical failure/malfunction
- equipment design deficiencies
- product parameters (temperature, flows, pressure and levels)
- process control system malfunction
- power/utility failures
- software problems
- multitasking.

An ability to communicate with other work groups and personnel during the operation and monitoring of this panel is considered to be an essential element of this unit of competency.

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- advanced control features
- interactions between control loops
- interactions between plant units within the entire plant
- the architecture and location of the process/production equipment
- specific plant process operations
- interactions between plant items/processes
- product specifications and tolerances
- systems operating parameters
- system integrity limits
- process control philosophies and strategies
- emergency shutdown procedures
- process specific physics, chemistry and mathematics
- relevant chemistry of the process to the level of writing chemical equations and identifying and manipulating factors controlling rate of reaction and yield (or equivalent physics for a physical process/biochemistry for a biochemical process) - chemistry to include both intended products and interfering reactions (eg salts, hydrates)
- basic science of upstream and downstream processes
- interactions between plant area and other value stream members
- impact of external factors, eg variations in weather, feed etc
- complex process drawings, eg P&ID, PFD, cause and effect
- basis of control for the plant/s
- instrumentation and control systems including feed forward, feed back and open control
- instrumentation and control system components (eg relevant primary sensing devices, final control elements, transducers/transmitters)
- control loops (including PID control, set points, controlled variable, indicated variable)
- interaction between multiple control loops (including cascade control)
- impacts of changing controller settings and the limits within which changes can be made
- effective communication techniques

REQUIRED SKILLS AND KNOWLEDGE

- organisation procedures
- UPS and its applications and use.

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

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

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and will include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practiced in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the process control system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what-if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responses. The emphasis should be on the ability to stay out of

EVIDENCE GUIDE	
	<p>trouble rather than on recovery from a disaster.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
Context of and specific resources for assessment	<p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, communication and leadership units.</p>
Guidance information for assessment	<p>Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee and the work being performed.</p>

Range Statement

RANGE STATEMENT

The 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	<p>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):</p> <ul style="list-style-type: none"> • 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. <p>Typical problems for your plant may include:</p> <ul style="list-style-type: none"> • 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	<p>Alarms or other abnormal conditions includes:</p> <ul style="list-style-type: none"> • emergency, including emergency shut down • partial or complete controller failure.
Other problems	<p>Other problems includes:</p> <ul style="list-style-type: none"> • problem solving control functions
Appropriate action	<p>Appropriate action includes:</p> <ul style="list-style-type: none"> • determining problems needing action

RANGE STATEMENT	
	<ul style="list-style-type: none"> • 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	<p>Procedures may be written, verbal, computer-based or in some other form. They include:</p> <ul style="list-style-type: none"> • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. <p>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.</p>
Health, safety and environment (HSE)	<p>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.</p>

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	<p>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.</p> <p>Typical systems optimisations may include:</p> <ul style="list-style-type: none">• 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 <p>The senior technician would:</p> <ul style="list-style-type: none">• 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. <p>Generally the technician would work alone for this unit, although the ability to communicate with all internal and external stakeholders is vital.</p>
--------------------------------	---

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
	<p>3.2. Discuss possible solutions to cause with relevant people</p> <p>3.3. Arrange for required tests or controls to be undertaken in appropriate time frame</p> <p>3.4. Collect further data from tests or trials</p> <p>3.5. Review plant or process data and compare with original data.</p> <p>3.6. Prepare further tests or trials as required, or until possible solutions are developed.</p>
4. Develop improvement solution	<p>4.1. Agree required improvement solution with appropriate people</p> <p>4.2. Arrange for required improvement solution to be undertaken in appropriate time frame</p> <p>4.3. Follow items initiated through until final resolution has occurred</p> <p>4.4. Check effectiveness of solution and take appropriate action</p> <p>4.5. Complete reports to procedure.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
<p>This unit requires skills of:</p> <ul style="list-style-type: none"> • data collection and analysis • problem solving for multi-variable processes • negotiation • communication • basic mathematics
Required knowledge
<p>Competence includes a deep understanding of:</p> <ul style="list-style-type: none"> • 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	
	<p>analysed and the most likely cause determined</p> <ul style="list-style-type: none"> • appropriate action is taken. <p>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.</p>
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	
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. 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.</p>	
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	<p>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.</p> <p>The senior technician may provide expertise in the following areas:</p> <ul style="list-style-type: none">• 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. <p>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.</p>
--------------------------------	--

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
	<p>information</p> <p>3.3. Review operator training and procedures with project design team as required</p> <p>3.4. Document procedures, training and reviews as required.</p>

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	<p>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.</p> <p>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.</p> <p>This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> 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. <p>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.</p>
Context of and specific resources for assessment	<p>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.</p>

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	<p>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.</p> <p>The technician would:</p> <ul style="list-style-type: none">• 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. <p>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.</p>
--------------------------------	--

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
	<p>required</p> <p>3.5. Keep all other stakeholders informed of progress</p> <p>3.6. When plant is restored to stable conditions, continue to monitor the situation.</p>
4. Document abnormal situation and response.	<p>4.1. Complete all logs and workplace documentation relating to the abnormal situation, ensuring all details, actions and responses are accurately recorded</p> <p>4.2. Record any further ongoing production problems and report to appropriate persons or authority.</p>

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	<p>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.</p> <p>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.</p> <p>This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
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	<p>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.</p> <p>This competency is typically performed by senior technicians.</p> <p>It includes:</p> <ul style="list-style-type: none">• 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.	<p>calculation</p> <p>5.2.Determine possible sources of data required from the plant</p> <p>5.3.Match and adjust sources of data to desired boundary for energy balance</p> <p>5.4.Determine overall heating load</p> <p>5.5.Determine overall cooling load</p> <p>5.6.Determine the adequacy (or otherwise) of the process/plant heating/cooling system to cope with this load.</p>

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	
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. 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.</p>	
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	<p>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.</p> <p>Heat transfer modes include:</p> <ul style="list-style-type: none"> • conduction • convection (forced and natural) • radiation • combined conduction/convection. <p>Sources of heating/cooling include:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>This competency is typically performed by senior technicians.</p> <p>It includes:</p> <ul style="list-style-type: none">• 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. <p>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.</p>
--------------------------------	--

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
	<p>4.3. Match and adjust sources of data to desired boundary for mass balance</p> <p>4.4. Determine overall mass balance</p> <p>4.5. Determine mass balance for each significant component/ reactant and product</p> <p>4.6. Determine the adequacy (or otherwise) of the process/plant heating/cooling system to meet production requirements.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
<p>Competence includes the ability to:</p> <ul style="list-style-type: none"> 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. <p>Competence also includes the ability, for the practical completion of the job, to apply and/or explain:</p> <ul style="list-style-type: none"> 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	<p>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.</p> <p>Assessment will typically be by a mass balance project(s).</p> <p>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.</p>
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Competence must be demonstrated in the ability to complete a mass balance in a structured way, taking real data from an operating plant.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
Context of and specific resources for assessment	<p>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.</p>
Method of assessment	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and</p>

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	
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. 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.</p>	
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	<p>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.</p> <p>Mass transfer modes include:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>Utilities is used to mean:</p> <ul style="list-style-type: none">• 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. <p>The plant technician would:</p> <ul style="list-style-type: none">• 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. <p>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.</p> <p>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>.</p>
--------------------------------	---

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
	<p>by each plant item</p> <p>2.3. Physically check each item of equipment for signs of inefficient utility use, eg faulty steam traps, leaks</p> <p>2.4. Compile report/database showing actual usage of utilities and observed problems.</p>
3. Determine efficiency of use.	<p>3.1. Determine theoretical consumption of utilities for equipment items from engineering specifications, by calculation or other methods</p> <p>3.2. Compare actual consumption of utilities with theoretical consumption</p> <p>3.3. Determine inefficient users of utilities</p> <p>3.4. Compile report/database showing efficiency of use of utilities.</p>
4. Take required action to improve utility efficiency.	<p>4.1. Rank inefficient users in priority order for remediation based on costs and business requirements</p> <p>4.2. Investigate and determine cause(s) of inefficiency in the higher ranked users</p> <p>4.3. Develop plans to remove the causes of inefficiency</p> <p>4.4. Identify any safety, health and environmental (HSE) implications of planned actions and address prior to any implementation of changes</p> <p>4.5. Consult with relevant stakeholders regarding HSE implications and the implementation of these plans</p> <p>4.6. Initiate appropriate action for items within scope of authority</p> <p>4.7. Follow through on items to facilitate a timely completion</p> <p>4.8. Report/make recommendations on required improvements which are beyond scope of authority to action.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This describes the essential skills and knowledge and their level, required for this unit.
Required skills
<p>Ability to:</p> <ul style="list-style-type: none"> 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	
	<p>to assess from the plans for implementation.</p> <p>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.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>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.</p> <p>Consistent performance should be demonstrated. In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p>
<p>Method of assessment</p>	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p>

EVIDENCE GUIDE	
	<p>It may be appropriate to co-assess this unit with</p> <ul style="list-style-type: none"> • <i>PMAOPS511B Determine energy transfer loads</i> • <i>PMAOPS512B Determine mass transfer loads.</i> <p>However, these are not prerequisites or co-requisites as there are other ways of obtaining the data.</p>
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	
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. 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.</p>	
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	<p>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.</p> <p>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.</p> <p>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.</p> <p>The reasons for the shutdown could include:</p> <ul style="list-style-type: none">• regulatory vessel inspection (PVI)• major maintenance• upgrades or refits• catalyst and/or column repacking• other activities which are scheduled for the shutdown. <p>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.</p>
--------------------------------	---

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.	<p>required tasks</p> <p>2.2.Determine time, people, material, other resources required and 'owner' for each task</p> <p>2.3.Determine prerequisite tasks for each task</p> <p>2.4.Identify conflicts between tasks arising from resources or other causes</p> <p>2.5.Negotiate conflicts between tasks</p> <p>2.6.Compile database of all tasks and their requirements.</p>
3. Develop schedule.	<p>3.1.Develop draft shutdown schedule (including planning activities)</p> <p>3.2.Determine critical path for shutdown tasks</p> <p>3.3.Analyse tasks on critical path to determine methods of reducing critical path</p> <p>3.4.Develop revised schedule</p> <p>3.5.Consult with all relevant stakeholders and analyse revised schedule for conflicts and possible savings</p> <p>3.6.Negotiate conflicts</p> <p>3.7.Develop final schedule and critical path.</p>
4. Communicate with all relevant stakeholders.	<p>4.1.Contribute to shutdown planning meetings with stakeholders.</p> <p>4.2.Meet with stakeholders individually</p> <p>4.3.Prepare reports and documents as required</p> <p>4.4.Ensure all permissions required for tasks have been obtained</p> <p>4.5.Liaise with suppliers and contractors to obtain parts, materials and services.</p>
5. Monitor shutdown.	<p>5.1.Establish systems to allow monitoring of shutdown to schedule</p> <p>5.2.Monitor progress to schedule</p> <p>5.3.Identify causes of not meeting schedule</p> <p>5.4.Negotiate a solution to cause</p> <p>5.5.Adjust schedule to meet changed circumstances but still meet overall timeline (if at all possible).</p>

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	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to co-assess this unit with</p> <ul style="list-style-type: none"> • <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	
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. 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.</p>	
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	<p>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.</p> <p>Databases may be:</p> <ul style="list-style-type: none"> • electronic databases (such as Access, DB, Oracle) • other electronic forms (such as spread sheets) • card files • other paper based systems <p>Scheduling may include:</p> <ul style="list-style-type: none"> • electronic project planning tools (such as MS Project) • other specialised planning software

RANGE STATEMENT	
	<ul style="list-style-type: none"> • paper techniques
Procedures	<p>Procedures may be written, verbal, computer-based or in some other form. They include:</p> <ul style="list-style-type: none"> • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant. <p>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.</p>
Health, safety and environment (HSE)	<p>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.</p>

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	<p>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.</p> <p>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>)</p> <p>Key aspects of the competency include:</p> <ul style="list-style-type: none">• 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
--------------------------------	--

	<ul style="list-style-type: none"> 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
	<p>assign appropriate owner</p> <p>2.3. Determine prerequisite tasks prior to shutting down process</p> <p>2.4. Ensure hazards are identified and controls are in place</p> <p>2.5. Ensure all safety and testing equipment is calibrated and on site prior to shutdown commencing</p> <p>2.6. Compile a schedule to track shutdown and equipment preparation sequence</p>
3. Co-ordinate plant/ equipment shutdown sequence	<p>3.1. Prepare/review shutdown documentation</p> <p>3.2. Coordinate plant shutdown as per procedures</p> <p>3.3. Track plant shutdown progress.</p> <p>3.4. Coordinate execution of critical function test during shut down phase</p> <p>3.5. Coordinate equipment preparation</p> <p>3.6. Validate equipment is safe to handover to appropriate work party.</p>
4. Handover plant/ equipment to relevant work party	<p>4.1. Handover plant and equipment to relevant work group per site protocol</p> <p>4.2. Perform safety audits during shutdown work</p> <p>4.3. Record/report HSE non conformance</p> <p>4.4. Communicate as and when required</p> <p>4.5. Monitor shutdown work against critical path</p> <p>4.6. Monitor resource usage and take appropriate action</p> <p>4.7. Identify barriers to achieving shutdown critical path and negotiate solution.</p>
5. Communicate with all relevant stakeholders	<p>5.1. Communicate shutdown plan/schedule to operations team</p> <p>5.2. Attend and contribute to regular shutdown progress meetings</p> <p>5.3. Record and report daily shutdown activities.</p> <p>5.4. Ensure all authorisations required for tasks have been obtained</p> <p>5.5. Identify, communicate and manage HSE issues arising during execution of shut down activities</p> <p>5.6. Contribute to post shutdown review.</p>
6. Return plant to service	<p>6.1. Confirm that all scheduled work on equipment is complete before hand back is accepted</p> <p>6.2. Ensure equipment hand back documentation</p>

ELEMENT	PERFORMANCE CRITERIA
	<p>complete per site protocol</p> <p>6.3. Coordinate pre-start equipment integrity checks</p> <p>6.4. Coordinate and validate plant de-isolation and preparation for service</p> <p>6.5. Ensure appropriate plant start up authority is obtained</p> <p>6.6. Coordinate start up critical function tests as required</p> <p>6.7. Coordinate and record plant start up progress</p>

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	
	<ul style="list-style-type: none"> • 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	<p>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</p> <p>It may be appropriate to assess this unit concurrently with other relevant units</p>
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	
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold 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.</p>	
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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> maintenance planning process/production records other sources
Resources required for task	Resources required for task include: <ul style="list-style-type: none"> time people material other
Resource requirements	Resource requirements may include but not limited to: <ul style="list-style-type: none"> 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	
	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • procedures • packages • isolation lists • blinds list • punch lists
Equipment preparation	Equipment preparation includes: <ul style="list-style-type: none"> • isolation • blinding/spading • purging • ventilation • washing
Communication	Communication includes: <ul style="list-style-type: none"> • 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	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
--------------------------------	--

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
	<p>2.3. Compile a shortlist of modification types/equipment classes which will best meet the modification brief</p> <p>2.4. Discuss shortlist alternatives with relevant stakeholders and obtain 'sign off' for the chosen approach.</p>
3. Select technically best equipment/unit/modification.	<p>3.1. Complete technical specification for required modification incorporating feedback received</p> <p>3.2. Compare specification with that of 'off the shelf' equipment where appropriate</p> <p>3.3. Arrange for equipment suppliers to tender to the specification where necessary, following company procedures</p> <p>3.4. Rank competing items by their compliance with the technical specification.</p>
4. Compare hazard profile of possible modifications.	<p>4.1. Organise a hazard analysis (eg HAZOP) for the modification according to company procedures</p> <p>4.2. Ensure that all stakeholders are represented on the hazard analysis team</p> <p>4.3. Brief the hazard analysis team on the modification and the alternatives under evaluation</p> <p>4.4. Eliminate alternatives which do not meet hazard requirements</p> <p>4.5. Rank remaining competing items by safety performance.</p>
5. Make final choice of solution.	<p>5.1. Evaluate competing items by their economic performance (eg, life, maintenance, running costs) and rank by total lifetime cost</p> <p>5.2. Seek further information where necessary to allow a rational selection to be made</p> <p>5.3. Choose the modification which meets all required minimum standards and will provide the best solution</p> <p>5.4. Verify choice in discussion with production and engineering managers and other key stakeholders</p> <p>5.5. Arrange for order to be placed, following company procedures.</p>
6. Check and commission modification.	<p>6.1. Undertake pre-commissioning activities</p> <p>6.2. Complete safety acceptance documentation</p> <p>6.3. Identify, record and report problems or non-conformances</p>

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
<p>Competence includes the ability to read and interpret:</p> <ul style="list-style-type: none"> plant schematics (eg P&IDs, PFDs, instrument and process diagrams) construction or layout drawings <p>equipment designs, specifications and manufacturer data</p> <p>Discuss and negotiate with other appropriate personnel to agree necessary and desirable:</p> <ul style="list-style-type: none"> technical requirements operations requirements timelines cost and other requirements
Required knowledge
<p>Demonstration of competence in this unit must include knowledge of the following:</p> <ul style="list-style-type: none"> 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	
	<ul style="list-style-type: none"> 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. <p>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.</p>
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	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with:</p> <ul style="list-style-type: none"> <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
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the</p>

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	<p>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:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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. <p>Required minimum standards include:</p> <ul style="list-style-type: none"> • 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	<p>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>).</p> <p>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.</p>
------------------------	--

Application of the Unit

Application of the unit	<p>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>).</p> <p>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.</p>
--------------------------------	--

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.	<p>4.1. Organise a hazard analysis (eg HAZOP) for the solutions according to company procedures</p> <p>4.2. Ensure that all stakeholders are represented on the hazard analysis team</p> <p>4.3. Brief the hazard analysis team on the problem and solution alternatives under evaluation</p> <p>4.4. Eliminate alternatives which do not meet hazard requirements</p> <p>4.5. Rank remaining competing items by safety performance.</p>
5. Make final choice of solution.	<p>5.1. Seek further information where necessary to allow a rational selection to be made</p> <p>5.2. Choose the solution which meets all required minimum standards and will provide the best solution</p> <p>5.3. Verify choice in discussion with production and engineering managers and other key stakeholders</p> <p>5.4. Obtain necessary approvals/authorisations</p>
6. Check solution.	<p>6.1. Initiate and monitor the implementation of the solution.</p> <p>6.2. Ensure all checks and acceptances are done to procedures</p> <p>6.3. Conduct trials/test runs as required</p> <p>6.4. Collect and analyse data.</p>
7. Complete modification.	<p>7.1. Evaluate performance of solution</p> <p>7.2. Make adjustments as required</p> <p>7.3. Ensure plant procedures and training material updated</p> <p>7.4. Ensure plant drawings and engineering specifications are updated</p> <p>7.5. Complete all other required paperwork.</p>

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	
	<p>also include the use of case studies/scenarios and role plays.</p> <p>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.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Competence must be demonstrated in the ability to specify the requirements and then select the best solution to meet the necessary and desirable requirements.</p> <p>In particular look to see that:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
<p>Context of and specific resources for assessment</p>	<p>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.</p>
<p>Method of assessment</p>	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.</p> <p>It may be appropriate to assess this unit concurrently with units which deal with:</p>

EVIDENCE GUIDE	
	<ul style="list-style-type: none"> • 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	
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. 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.</p>	
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	<p>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.</p> <p>Required minimum standards include:</p> <ul style="list-style-type: none"> • 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	<p>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.</p> <p>This competency also applies to capital projects, as well as improvements brought about by changes in work practices and procedures</p>
------------------------	---

Application of the Unit

Application of the unit	<p>In this competency, an operator would develop practices or procedures for:</p> <ul style="list-style-type: none">• conserving resources• minimising pollution• minimising waste. <p>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.</p> <p>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.</p>
--------------------------------	--

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
	<p>greater benefit from their reduction</p> <p>2.5. Develop methods to reduce the production of this pollutant</p> <p>2.6. Complete required documentation to implement change.</p>
3. Develop waste minimisation practices and/or procedures.	<p>3.1. Identify the nature of wastes produced by the plant/process</p> <p>3.2. Determine the source(s) of these wastes within the plant/process</p> <p>3.3. Describe the impact of these wastes on the environment and society</p> <p>3.4. Determine which waste(s) will yield a greater benefit from their reduction</p> <p>3.5. Develop methods to reduce the production of this waste</p> <p>3.6. Complete required documentation to implement change.</p>

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

EVIDENCE GUIDE	
	<p>implement changes</p> <ul style="list-style-type: none"> the greatest yield is achieved by appropriate selection of type of resource usage, type of pollutant or waste product. <p>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.</p>
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	<p>In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:</p> <ul style="list-style-type: none"> Competency units relevant to the type of process equipment. <p>In a major hazard facility, it may be appropriate to assess this unit concurrently with OHS units.</p>
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
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. Add any essential operating conditions that may</p>

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	<p>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:</p> <ul style="list-style-type: none"> • 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. <p>Typical objectives will include:</p> <ul style="list-style-type: none"> • 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. <p>All operations are performed in accordance with standard procedures and policies.</p>
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	<p>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.</p> <p>In a major hazard facility, it may be appropriate to assess this unit concurrently with relevant OHS units.</p>
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	
<p>The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the Performance Criteria, is detailed below. 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.</p>	
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	<p>This competency covers process manufacturing plants which may involve workplace hazards such as:</p> <ul style="list-style-type: none"> chemicals and hazardous materials gases and liquids under pressure materials handling. <p>This competency includes:</p> <ul style="list-style-type: none"> legislation, codes and national standards relevant to the workplace which may include: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> liquid waste solid waste gas/fume/vapour/smoke emissions, including fugitive emissions hazardous materials excessive energy and water use excessive noise <p>and the workplace practices that can be used to minimise or prevent these effects.</p>
Information	<p>Information may include:</p> <ul style="list-style-type: none"> 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	<p>Work group may include:</p> <ul style="list-style-type: none"> formal or unstructured groups

RANGE STATEMENT	
	<ul style="list-style-type: none"> • two or more people.
Proactive environmental management	<p>Proactive environmental management may include:</p> <ul style="list-style-type: none"> • 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	<p>Some approaches to proactive environmental management may include:</p> <ul style="list-style-type: none"> • 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	<p>Environmental management policies must be appropriate to the scope and scale of the enterprise and may include:</p> <ul style="list-style-type: none"> • 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	<p>Typical functions may include:</p> <ul style="list-style-type: none"> • examining plant records • examining operating procedures and practices • liaising with a range of internal people
Health, safety and environment (HSE)	<p>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.</p>

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

Release	TP Version	Comments
3	PSP12V1	Unit descriptor edited.
2	PSP04V4.2.	Layout adjusted. No changes to content.
1	PSP04V4.1	Primary release.

Unit Descriptor

This unit covers 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.

This unit, and unit *PSPPM405A Administer simple projects*, are mutually exclusive. One or the other, but not both, may contribute to a qualification.

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

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements are the essential outcomes of the unit of competency. Together, performance criteria specify the requirements for competent performance. Text in ***bold italics*** is explained in the Range Statement following.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1. 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 recommended/made in accordance with the project plan, and documented in accordance with ***policy and procedures***.

3. Monitor project

- 3.1 All aspects of the project are continually monitored and

ELEMENT**PERFORMANCE CRITERIA**

	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

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
- 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

The Evidence Guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the Unit descriptor, Performance Criteria, the Range Statement and the Assessment Guidelines for the Public Sector Training Package.

Units to be assessed together

- *Pre-requisite* units that must be achieved prior to this unit: *Nil*
- *Co-requisite* units that must be assessed with this unit: *Nil*
- *Co-assessed units* that may be assessed with this unit to increase the efficiency and realism of the assessment process include, but are not limited to:
 - 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
- 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

The Range Statement provides information about the context in which the unit of competency is carried out. The variables cater for differences between States and Territories and the Commonwealth, and between organisations and workplaces. They allow for different work requirements, work practices and knowledge. The Range Statement also provides a focus for assessment. It relates to the unit as a whole. Text in ***bold italics*** in the Performance Criteria is explained here.

Project plan 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)
- 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
- 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
- resources management
- people management
- logistics management
- risk management

Change proposals may include:

- contract management
- change management
- scope
- administration
- engineering, technical, technology changes
- time
- cost
- resources

Policy and procedures may include:

- 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

Specifications may include:

- functional
- technical
- performance
- material

Unit Sector(s)

Not applicable.

Competency field

Project Management.

PSPPM502B Manage complex projects

Modification History

Release	TP Version	Comments
3	PSP12V1	Unit descriptor edited.
2	PSP04V4.2.	Layout adjusted. No changes to content.
1	PSP04V4.1	Primary release.

Unit Descriptor

This unit covers 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.

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

Application of the Unit

Not applicable.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements are the essential outcomes of the unit of competency. Together, performance criteria specify the requirements for competent performance. Text in ***bold italics*** is explained in the Range Statement following.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Manage start-up activities	<p>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.</p> <p>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.</p> <p>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.</p> <p>1.4 <i>Project management tools</i> are selected and applied effectively to achieve project outcomes.</p>
2. Manage project implementation	<p>2.1 <i>Integration</i> and <i>management</i> of complex project activities are handled in accordance with the project plan.</p> <p>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>.</p> <p>2.3 <i>Stakeholder</i> input and expectations are managed throughout the project in accordance with the communication plan.</p> <p>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.</p> <p>2.5 Project <i>change proposals</i> are negotiated, agreed and documented in accordance with policy and procedures.</p>
3. Manage project integration	<p>3.1 All aspects of the project and related projects are integrated and links are established to ensure objectives are met in accordance with the project plan.</p>

ELEMENT**PERFORMANCE CRITERIA**

- | | |
|---|---|
| | 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 <i>specifications</i> , 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

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 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

The Evidence Guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the Unit descriptor, Performance Criteria, the Range Statement and the Assessment Guidelines for the Public Sector Training Package.

Units to be assessed together

- *Pre-requisite* units that must be achieved prior to this unit: *Nil*
- *Co-requisite* units that must be assessed with this unit: *Nil*
- *Co-assessed units* that may be assessed with this unit to increase the efficiency and realism of the assessment

process include, but are not limited to:

- 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 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

The Range Statement provides information about the context in which the unit of competency is carried out. The variables cater for differences between States and Territories and the Commonwealth, and between organisations and workplaces. They allow for different work requirements, work practices and knowledge. The Range Statement also provides a focus for assessment. It relates to the unit as a whole. Text in ***bold italics*** in the Performance Criteria is explained here.

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)

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

Integration of project activities may include:

- Critical Path Method
- cost schedule control system
- logistics support analysis
- life cycle cost analysis
- spreadsheets
- recording systems - electronic and manual
- scope
- time
- cost
- quality
- human resources
- communications
- risk
- procurement

Management may include:

- 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

Development may include:

- regular meetings
- feedback
- encouragement
- mentoring and coaching
- additional physical and human resources (within allocated budget) if and as required

Policy and procedures may include:

- 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

Project Management.

RIIRIS201B Conduct local risk control

Modification History

Not applicable.

Unit Descriptor

This unit covers the conduct of local risk control in resources and infrastructure industries. It includes identifying hazards; assessing risk and identifying unacceptable risk; identifying, assessing and implementing risk treatments; and completing records and reports.

Application of the Unit

This unit is appropriate for those working in entry level operational roles, at worksites within:

- Civil construction
- Coal mining
- Drilling
- Extractive industries
- Metalliferous mining

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

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

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Identify hazards	1.1. Access, interpret and apply <i>compliance documentation</i> relevant to conducting local risk control 1.2. Inspect work area conditions to identify potential <i>hazards</i> in the workplace 1.3. Apply existing procedures to deal with recognised hazards 1.4. Recognise the type and scope of unresolved hazards and their likely impact
2. Assess <i>risk</i> and identify unacceptable risk	2.1. Assess and determine <i>consequence</i> if the event should occur 2.2. Consider and determine <i>likelihood</i> of the event 2.3. Identify criteria for the acceptability/unacceptability of the <i>risk</i> or source from the appropriate party 2.4. Assess risk against criteria to identify if it warrants ' <i>unacceptable risk</i> ' status and either action or refer to the appropriate party
3. Identify, assess and implement risk treatments	3.1. Identify and consider all possible <i>risk treatment options</i> 3.2. Identify options by preliminary analysis and consideration of possible options 3.3. Analyse options, including the identification of resource requirements 3.4. Select most appropriate action for dealing with the situation 3.5. Plan and prepare the course of action in detail and acquire/obtain required resources 3.6. Implement the risk treatment 3.7. Review risk management processes
4. Complete records and reports	4.1. Communicate information on the course of action and implementation 4.2. Complete <i>records and reports</i> for hazards and actions from personal risk assessment as specified by legislation and site

	requirements
--	--------------

Required Skills and Knowledge

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

Required skills

Specific skills are required to achieve the performance criteria in this unit, particularly for the application in the various circumstances in which this unit may be applied. This includes the ability to carry out the following as required to conduct local risk control:

- apply legislative, organisation and site requirements and procedures
- speak clearly and directly, listen carefully to instructions and information, respond to and clarify directions
- collect, analyse and organise information
- access, interpret and apply site information
- work with other team members
- apply teamwork to a range of situations
- apply problems solving skills
- apply decision making skills
- show initiative in adapting to changing work conditions or contexts
- apply time management
- take responsibility for self organisation of work priorities
- apply mathematical skills to perform a basic risk ranking of hazards
- interpret and apply material safety data sheets (MSDS)

Required knowledge

Specific knowledge is required to achieve the performance criteria of this unit, particularly its application in a variety of circumstances in which the unit may be used. This includes knowledge of the following as required to conduct local risk control:

- risk management processes and methods, including: identifying hazards, assessing risks, determining acceptability of risks, identifying controls
- AS/NZS 4360-2004 Risk Management
- specific worksite risk management procedures
- specific worksite safety systems information
- specific worksite communication, reporting and recording procedures

Evidence Guide

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

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>The evidence required to demonstrate competency in this unit must be relevant to worksite operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit and include evidence of the following:</p> <ul style="list-style-type: none"> • knowledge of the requirements, procedures and instructions to conduct local risk control • implementation of requirements, procedures and techniques for the safe, effective and efficient conduct of local risk control • working with others to undertake and conduct of local risk control that meets all of the required outcomes • consistent timely completion of conducting local risk control that safely, effectively and efficiently meets the required outcomes
Context of and specific resources for assessment	<ul style="list-style-type: none"> • This unit must be assessed in the context of the work environment. Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated environment provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills. • The assessment environment should not disadvantage the participant. For example, language, literacy and numeracy demands of assessment should not be greater than those required on the job. • Customisation of assessment and delivery environment to sensitively accommodate cultural diversity. • Aboriginal people and other people from a non English speaking background may have second language issues.

	<ul style="list-style-type: none"> • Assessment of this competency requires typical resources normally used in the work environment. Selection and use of resources for particular worksites may differ due to site circumstances. • Where applicable, physical resources should include equipment modified for people with disabilities. • Access must be provided to appropriate learning and/or assessment support when required.
Method of assessment	<p>This unit may be assessed in a holistic way with other units of competency. The assessment strategy for this unit must verify required knowledge and skill and practical application using more than one of the following assessment methods:</p> <ul style="list-style-type: none"> • written and/or oral assessment of the candidate's required knowledge • observed, documented and/or first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> • implementation of appropriate requirement, procedures and techniques for the safe, effective and efficient achievement of required outcomes • consistently achieving the required outcomes • first hand testimonial evidence of the candidate's: <ul style="list-style-type: none"> • working with others to undertake and conduct of local risk control
Guidance information for assessment	Consult the SkillsDMC User Guide for further information on assessment including access and equity issues.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Relevant compliance documentation may include:	<ul style="list-style-type: none"> legislative, organisation and site requirements and procedures Australian standards code of practice Employment and Workplace Relations legislation Equal Employment Opportunity and Disability Discrimination legislation
Hazard is defined as:	<ul style="list-style-type: none"> a source of potential harm or a situation with a potential to cause loss
Hazards may include:	<ul style="list-style-type: none"> equipment stored energy methods plans people the work environment
Risk is defined as:	<ul style="list-style-type: none"> The chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood
Risk treatment is defined as:	<ul style="list-style-type: none"> selection and implementation of appropriate options for dealing with risk
Consequence is defined as:	<ul style="list-style-type: none"> the outcome of an event or situation expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain
Frequency is defined as:	<ul style="list-style-type: none"> a measure of likelihood expressed as the number of occurrences of an event in a given time
Likelihood is used as:	<ul style="list-style-type: none"> a qualitative description of probability and frequency
Probability is defined as:	<ul style="list-style-type: none"> the measure of the chance of occurrence expressed as a number between 0 and 1
Criteria for the acceptability/unacceptability of the risk must be determined by:	<ul style="list-style-type: none"> the organisation's internal policy, goals and/ or objectives in reference to relevant legislation
Risk treatment options may include:	<ul style="list-style-type: none"> eliminating the hazard substitution engineering controls administrative controls (procedures, etc) personal protective equipment.
Records and reports may include:	<ul style="list-style-type: none"> hazard reporting forms supervisor/deputy/OCE reports

	<ul style="list-style-type: none">• incident reports• near miss reports• shift reports• JSAs• Take 5• Step Back
--	--

Unit Sector(s)

Risk Management

Competency field

Refer to Unit Sector(s).

Co-requisite units

Not applicable.

TAEASS301B Contribute to assessment

Modification History

Version	Comments
---------	----------

TAEASS301B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>
------------	--

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to contribute to the assessment process.

Application of the Unit

This unit typically applies to a person with technical or vocational expertise who is in a supervisory or mentoring/coaching work role and for whom collecting evidence for assessment is an adjunct to principal work responsibilities.

This unit is performed under the following conditions:

- the necessary assessment tools and assessment resources to guide the evidence collection process have been provided
- any adjustments to tools are determined by the qualified assessor (as defined by the Australian Quality Training Framework and the assessor requirements of the relevant training package), who provides guidance and supervision.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
---------	----------------------

ELEMENT

Elements describe the essential outcomes of a unit of competency .

PERFORMANCE CRITERIA

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

Elements and Performance Criteria

1. Clarify role and responsibilities in the assessment process	<p>1.1 Discuss and confirm <i>purpose of assessment</i> with <i>relevant people</i></p> <p>1.2 Discuss and confirm <i>benchmarks for assessment</i> with qualified assessor</p> <p>1.3 Access, read and clarify <i>assessment plan</i> with qualified assessor</p> <p>1.4 Discuss and agree with qualified assessor the specific responsibilities in gathering evidence and types of evidence to be gathered</p>
2. Confirm organisational arrangements for evidence gathering	<p>2.1 Access and confirm relevant <i>assessment system policies and procedures</i>; organisational, legal and ethical requirements; and other relevant advice on assessment</p> <p>2.2 Clarify nominated <i>assessment tools</i> and methods for collecting evidence with qualified assessor, to ensure that procedures to be followed and instruments to be used are clear</p> <p>2.3 Discuss and confirm with relevant people <i>assessment context</i>, including candidate's characteristics and any need for <i>reasonable adjustments</i></p> <p>2.4 Confirm and arrange <i>resource requirements</i> in consultation with relevant people</p>
3. Collect evidence in accordance with the assessment plan	<p>3.1 Explain assessment process to candidate, including the different responsibilities of the parties involved, and refer any candidate issues or concerns to qualified assessor prior to undertaking assessment activities</p> <p>3.2 Use <i>assessment instruments</i> to gather quality evidence within available time and resources, according to organisational, legal and ethical requirements</p>
4. Record and report findings	<p>4.1 Organise and provide evidence to the qualified assessor in a format suitable for analysis according to assessment system policies and procedures</p>

	<p>4.2 Actively seek feedback from the qualified assessor on whether evidence-gathering activities meet the principles of assessment and whether evidence collected meets the rules of evidence</p> <p>4.3 Document areas for improvement in collecting evidence, for future assessment activities</p>
--	--

Required Skills and Knowledge

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

Required skills

- observation skills to observe candidate performance
- cognitive and interpretation skills to ensure collection of valid and reliable evidence
- organisational skills to collect evidence
- time-management skills to schedule assessment events and activities
- literacy skills to:
 - read and interpret relevant information
 - prepare required documentation and collate evidence in required format
- communication skills to:
 - discuss evidence-gathering processes with practitioners and candidates
 - provide constructive and supportive feedback
 - ask appropriate questions to clarify and confirm instructions for evidence gathering
 - provide clear and concrete options and advice.

Required knowledge

- competency-based assessment, including:
 - criterion referenced
 - competency standards as the benchmarks for assessment
 - competency-based reporting
- principles of assessment
- rules of quality evidence
- different purposes of assessment
- diversity of assessment contexts
- evidence, including different types of evidence
- evidence-gathering methods – what are assessment methods and different types of methods
- purpose and features of assessment tools and assessment plans
- potential barriers and processes relating to evidence-gathering procedures and assessment processes
- organisational assessment system policies and procedures relevant to this unit of competency

- technical or subject area being assessed
- cultural sensitivity and equity considerations
- relevant policy, legislation, codes of practice and national standards, including commonwealth and state or territory legislation, that may affect training and assessment in the vocational education and training sector
- OHS relating to the work role, and OHS considerations to be included in collecting evidence, including:
 - hazard identification and risk control measures
 - requirements for reporting hazards and incidents
 - emergency procedures
 - procedures for use of relevant personal protective equipment
 - safe use of relevant equipment
 - sources of OHS information
 - role of key workplace personnel
 - responsibilities of learners.

Evidence Guide

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

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: <ul style="list-style-type: none"> • carry out a minimum of three evidence-gathering activities, with different candidates for each activity • present documentation of the evidence in a clear and concise manner • present documented feedback from others involved in the assessment.
Context of and specific resources for assessment	Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<i>Purpose of assessment</i> may be:	<ul style="list-style-type: none"> • recognise current existing competency of candidates • determine if competency has been achieved following learning • establish candidate progress towards achievement of competence • determine language, literacy and numeracy needs of candidate • certify competence through a Statement of Attainment • establish progress towards a qualification • determine training gaps of candidate • measure work performance • classify employee and support career progression • meet organisational requirements for work, such as operating equipment or developing new skills • satisfy licensing or regulatory requirements.
<i>Relevant people</i> must include:	<ul style="list-style-type: none"> • qualified assessors • candidates.
<i>Benchmarks for assessment:</i>	<ul style="list-style-type: none"> • refer to criteria against which candidate is assessed • may be a competency standard/unit of competency, assessment criteria of course curricula, performance specifications, or product specifications.
<i>Assessment plan</i> must include:	<ul style="list-style-type: none"> • purpose and aims of assessment • context of assessment • relevant benchmarks for assessment • other assessment information and documentation identified as relevant.
<i>Assessment system policies and procedures</i> may include:	<ul style="list-style-type: none"> • candidate selection • rationale and purpose of competency-based assessment • assessment records, data management and information management • recognition of current competency, recognition of prior learning and credit arrangements.
<i>Assessment tools</i> include:	<ul style="list-style-type: none"> • the learning or competency unit(s) to be assessed • the target group, context and conditions for the assessment • the tasks to be administered to the candidate • an outline of the evidence to be gathered from the candidate • the evidence criteria used to judge the quality of performance

	<p>(i.e. the assessment decision-making rules)</p> <ul style="list-style-type: none"> • the administration, recording and reporting requirements • the evidence of how validity and reliability have been tested and built into the design and use of the tool.
Assessment context may include:	<ul style="list-style-type: none"> • environment in which assessment will be carried out • relationship between units of competency and candidate's workplace • time period over which assessment takes place.
Reasonable adjustments may include:	<ul style="list-style-type: none"> • taking into account candidate's language, literacy and numeracy requirements • providing personal support services, such as arranging for: <ul style="list-style-type: none"> • member of the community to accompany the candidate • reader • interpreter • attendant carer • scribe • using adaptive technology or special equipment • providing flexible assessment sessions to allow for such things as fatigue or administering of medication • format of assessment materials, such as: <ul style="list-style-type: none"> • in Braille • in first language • use of audiotape or videotape • making adjustments to the physical environment • revising proposed assessment methods and instruments • considering age and gender • considering cultural beliefs, traditional practices and religious observances.
Resource requirements may include:	<ul style="list-style-type: none"> • resources specific to evidence-gathering activities • access to assessors • access to policy and procedures • access to subject and technical experts • OHS requirements • plant, equipment and technology.
Assessment instruments may include:	<ul style="list-style-type: none"> • instruments developed by an assessor as part of formative or summative assessment activities, including: <ul style="list-style-type: none"> • profiles of acceptable performance measures • templates and proformas • specific questions or activities • evidence and observation checklists • checklists for the evaluation of work samples

	<ul style="list-style-type: none">• recognition portfolios• candidate self-assessment materials• instruments developed elsewhere that have been modified by the assessor for use with a particular client group.
--	--

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS401B Plan assessment activities and processes

Modification History

Version	Comments
---------	----------

TAEASS301B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>
------------	--

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to plan and organise the assessment process, including recognition of prior learning (RPL), in a competency-based assessment system. It also includes the development of simple assessment instruments.

Application of the Unit

This unit typically applies to assessors and workplace supervisors with assessment planning responsibilities; and trainers or other assessors responsible for planning assessment, including RPL.

The unit is suitable for those with an existing assessment strategy which documents the overall framework for assessment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
---------	----------------------

Elements describe the essential outcomes of a

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text

ELEMENT

unit of competency.

PERFORMANCE CRITERIA

is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine assessment approach	<p>1.1 Identify candidate and confirm <i>purposes and context of assessment/RPL</i> with relevant people according to <i>legal, organisational and ethical requirements</i></p> <p>1.2 Identify and access <i>benchmarks for assessment/RPL</i> and any specific assessment guidelines</p>
2. Prepare the assessment plan	<p>2.1 Determine evidence and <i>types of evidence</i> needed to demonstrate competence, according to the <i>rules of evidence</i></p> <p>2.2 Select <i>assessment methods</i> which will support the collection of defined evidence, taking into account the context in which the assessment will take place</p> <p>2.3 Document all aspects of the <i>assessment plan</i> and confirm with relevant personnel</p>
3. Develop assessment instruments	<p>3.1 Develop <i>simple assessment instruments</i> to meet target group needs</p> <p>3.2 Analyse <i>available assessment instruments</i> for their suitability for use and modify as required</p> <p>3.3 <i>Map assessment</i> instruments against unit or course requirements</p> <p>3.4 Write clear instructions for candidate about the use of the instruments</p> <p>3.5 Trial draft assessment instruments to validate content and applicability, and record outcomes</p>

Required Skills and Knowledge

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

Required skills

- cognitive interpretation skills to:
 - interpret competency standards and other assessment documentation, including material

- relating to reasonable adjustment
- identify opportunities for integrated competency assessment
- contextualise competency standards to the operating assessment environment, including RPL
- consider access and equity needs of diverse candidates
- technology skills to use appropriate equipment and software to communicate effectively with others
- research and evaluation skills to:
 - obtain competency standards, assessment tools and other relevant assessment resources
 - research candidate characteristics and any reasonable adjustment needs
 - evaluate feedback, and determine and implement improvements to processes
- literacy skills to read and interpret relevant information to design and facilitate assessment and recognition processes
- communication skills to discuss assessment, including RPL processes with clients and other assessors
- interpersonal skills to:
 - demonstrate sensitivity to access and equity considerations and candidate diversity
 - promote and implement equity, fairness, validity, reliability and flexibility in planning an assessment processes.
- **Required knowledge**
- ethical and legal requirements of an assessor
- competency-based assessment, including:
 - work focused
 - criterion referenced
 - standards based
 - evidence based
- different purposes of assessment and different assessment contexts, including RPL
- how to read and interpret the identified competency standards as the benchmarks for assessment
- how to contextualise competency standards within relevant guidelines
- four principles of assessment and how they guide the assessment process
- purpose and features of evidence, and different types of evidence used in competency-based assessments, including RPL
- rules of evidence and how they guide evidence collection
- different types of assessment methods, including suitability for collecting various types of evidence
- assessment instruments and their purpose; different types of instruments; relevance of different instruments for specific evidence-gathering opportunities.

Evidence Guide

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

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<ul style="list-style-type: none"> • Evidence of the ability to: • plan and organise the assessment process on a minimum of two occasions • collect evidence that demonstrates: <ul style="list-style-type: none"> • documented assessment plans • having covered a range of assessment events • catering for a number of candidates • different competency standards or accredited curricula • an RPL assessment • contextualisation of competency standards and the selected assessment tools, where required • incorporation of reasonable adjustment strategies • development of simple assessment instruments for use in the process • organisational arrangements.
Context of and specific resources for assessment	<p>Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.</p> <p>Assessment must ensure access to training products, such as training packages and accredited course documentation.</p>
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<p><i>Purposes of assessment/ RPL</i> may include:</p>	<ul style="list-style-type: none"> • recognising current existing competence of candidates • determining if competence has been achieved following learning • establishing candidate progress towards achievement of competence • determining language, literacy and numeracy needs of candidates • certifying competence through a qualification or Statement of Attainment • licensing or regulatory requirements.
<p><i>Context of assessment/ RPL</i> may include:</p>	<ul style="list-style-type: none"> • environment in which the assessment/RPL will be carried out, including real or simulated workplace • opportunities for collecting evidence in a number of situations • relationships between competency standards and: <ul style="list-style-type: none"> • evidence to support RPL • work activities in the candidate's workplace • learning activities • who carries out the assessment/RPL.
<p><i>Organisational, legal and ethical requirements</i> may include:</p>	<ul style="list-style-type: none"> • assessment system policies and procedures • assessment strategy requirements • reporting, recording and retrieval systems for assessment, including RPL • quality assurance systems • business and performance plans • access and equity policies and procedures • collaborative and partnership arrangements • defined resource parameters • mutual recognition arrangements • industrial relations systems and processes, awards, and enterprise agreements • Australian Quality Training Framework • registration scope • human resources policies and procedures • legal requirements, including: <ul style="list-style-type: none"> • anti-discrimination • equal employment opportunity • job role, responsibilities and conditions • relevant industry codes of practice • confidentiality and privacy requirements • OHS considerations, including: <ul style="list-style-type: none"> • ensuring OHS requirements are adhered to during the

	<p>assessment process</p> <ul style="list-style-type: none"> identifying and reporting OHS hazards and concerns to relevant personnel.
Benchmarks for assessment/RPL may include:	<ul style="list-style-type: none"> criterion against which the candidate is assessed or prior learning recognised, which may be: <ul style="list-style-type: none"> competency standard/unit of competency assessment criteria of course curricula performance specifications of an enterprise or industry product specifications.
Types of evidence may include:	<ul style="list-style-type: none"> direct indirect supplementary.
Rules of evidence ensure that evidence collected is:	<ul style="list-style-type: none"> valid sufficient authentic current.
Assessment methods are the particular techniques used to gather evidence and may include:	<ul style="list-style-type: none"> direct observation, for example: <ul style="list-style-type: none"> real work/real time activities at the workplace work activities in a simulated workplace environment structured activities, for example: <ul style="list-style-type: none"> simulation exercises and role-plays projects presentations activity sheets questioning, for example: <ul style="list-style-type: none"> written questions, e.g. on a computer interviews self-assessment verbal questioning questionnaires oral or written examinations (applicable at higher AQF levels) portfolios of evidence, for example: <ul style="list-style-type: none"> collection of work samples compiled by candidate product with supporting documentation historical evidence journal or log book information about life experience review of products, for example: <ul style="list-style-type: none"> testimonials and reports from employers and supervisors

	<ul style="list-style-type: none"> evidence of training authenticated prior achievements interview with employer, supervisor, or peer.
<i>Assessment plan</i> may include:	<ul style="list-style-type: none"> overall planning document describing: <ul style="list-style-type: none"> what is to be assessed when assessment is to take place where assessment is to take place how assessment is to take place.
<i>Simple assessment instruments</i> may include:	<ul style="list-style-type: none"> instruments developed by an assessor as part of formative or summative assessment activities, including: <ul style="list-style-type: none"> profiles of acceptable performance measures templates and proformas specific questions or activities evidence and observation checklists checklists for the evaluation of work samples recognition portfolios candidate self-assessment materials instruments developed elsewhere that have been modified by the assessor for use with a particular client group.
<i>Available assessment instruments</i> may include:	<ul style="list-style-type: none"> commercially available instruments those created by others inside the registered training organisation.
<i>Map assessment</i> means:	<ul style="list-style-type: none"> showing a clear relationship between the evidence and the requirements of the unit.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS402B Assess competence

Modification History

Version	Comments
---------	----------

TAEASS402B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>
------------	--

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to assess the competence of a candidate.

Application of the Unit

This unit typically applies to assessors.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
---------	----------------------

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

Elements and Performance Criteria

1. Prepare for assessment	<p>1.1 Interpret assessment plan and confirm organisational, legal and ethical requirements for conducting assessment with relevant people</p> <p>1.2 Access and interpret relevant benchmarks for assessment and nominated assessment tools to confirm the requirements for evidence to be collected</p> <p>1.3 Arrange identified material and physical resource requirements according to assessment system policies and procedures</p> <p>1.4 Organise specialist support required for assessment</p> <p>1.5 Explain, discuss and agree details of the assessment plan with candidate</p>
2. Gather quality evidence	<p>2.1 Use agreed assessment methods and instruments to gather, organise and document evidence in a format suitable for determining competence</p> <p>2.2 Apply the principles of assessment and rules of evidence in gathering quality evidence</p> <p>2.3 Determine opportunities for evidence gathering in actual or simulated activities through consultation with the candidate and relevant personnel</p> <p>2.4 Determine opportunities for integrated assessment activities and document any changes to assessment instruments where required</p>
3. Support the candidate	<p>3.1 Guide candidates in gathering their own evidence to support recognition of prior learning (RPL)</p> <p>3.2 Use appropriate communication and interpersonal skills to develop a professional relationship with the candidate that reflects sensitivity to individual differences and enables two-way feedback</p> <p>3.3 Make decisions on reasonable adjustments with the candidate, based on candidate's needs and characteristics</p> <p>3.4 Access required specialist support in accordance with the assessment plan</p> <p>3.5 Address any OHS risk to person or equipment immediately</p>
4. Make the assessment decision	<p>4.1 Examine collected evidence and evaluate it to ensure that it reflects the evidence required to demonstrate competence</p> <p>4.2 Use judgement to infer whether competence has been demonstrated, based on the available evidence</p> <p>4.3 Make assessment decision in line with agreed assessment procedures and according to agreed assessment plan</p> <p>4.4 Provide clear and constructive feedback to candidate regarding</p>

	the assessment decision and develop any follow-up action plan required
5. Record and report the assessment decision	5.1 Record assessment outcomes promptly and accurately 5.2 Complete and process an assessment report according to agreed assessment procedures 5.3 Inform other relevant parties of the assessment decision according to confidentiality conventions
6. Review the assessment process	6.1 Review the assessment process in consultation with relevant people to improve own future practice 6.2 Document and record the review according to relevant assessment system policies and procedures

Required Skills and Knowledge

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

Required skills

- analysis and interpretation skills to:
 - break down competency standards
 - interpret assessment tools and other assessment information, including those used in RPL
 - identify candidate needs
 - make judgements based on assessment of available evidence
- observation skills to:
 - recognise candidate's prior learning
 - determine candidate's performance
 - identify when candidate may need assistance during the assessment processes
- research and evaluation skills to:
 - access required human and material resources for assessment
 - access assessment system policies and procedures
 - access RPL policies and procedures
 - evaluate evidence
 - evaluate assessment process
- cognitive skills to:
 - weigh up the evidence and make a judgement
 - consider and recommend reasonable adjustments
- decision-making skills to:
 - recognise a candidate's prior learning

- make a decision on a candidate's competence
- literacy skills to:
 - read and interpret relevant information to conduct assessment
 - prepare required documentation and records or reports of assessment outcomes in required format
- communication and interpersonal skills to:
 - explain the assessment, including RPL process
 - give clear and precise instructions
 - ask effective questions
 - provide clarification
 - discuss process with other relevant people
 - give appropriate feedback
 - discuss assessment outcome
 - use language appropriate to candidate and assessment environment
 - establish a working relationship with candidate.

Required knowledge

- competency-based assessment, including:
 - vocational education and training as a competency-based system
 - criterion-referenced assessment as distinct from norm-referenced assessment
 - competency standards as the basis of qualifications
 - structure and application of competency standards
 - principles of assessment and how they are applied
 - rules of evidence and how they are applied
 - range of assessment purposes and assessment contexts, including RPL
 - different assessment methods, including suitability for gathering various types of evidence, suitability for content of units, and resource requirements and associated costs
 - reasonable adjustments and when they are applicable
 - types and forms of evidence, including assessment instruments that are relevant to gathering different types of evidence used in competency-based assessment, including RPL
 - potential barriers and processes relating to assessment tools and methods
 - assessment system, including policies and procedures established by the industry, organisation or training authority
- RPL policies and procedures established by the organisation
- cultural sensitivity and equity considerations
- relevant policy, legislation, codes of practice and national standards, including commonwealth and state or territory legislation that may affect training and assessment in the vocational education and training sector, such as:
 - copyright and privacy laws in terms of electronic technology
 - security of information

- plagiarism
- training packages and competency standards
- licensing requirements
- industry and workplace requirements
- duty of care under common law
- recording information and confidentiality requirements
- anti-discrimination, including equal employment opportunity, racial vilification and disability discrimination
- workplace relations
- industrial awards and enterprise agreements
- OHS responsibilities associated with assessing competence, such as:
 - requirements for reporting hazards and incidents
 - emergency procedures
 - procedures for use of relevant personal protective equipment
 - safe use and maintenance of relevant equipment
 - sources of OHS information.
-

Evidence Guide

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

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: <ul style="list-style-type: none"> • assess competence of a number of candidates within the vocational education and training context against different units of competency or accredited curricula, following the relevant assessment plan • assess at least one candidate for RPL • consider reasonable adjustment and the reasons for decisions in at least one assessment • cover an entire unit of competency and show: <ul style="list-style-type: none"> • the application of different assessment methods and instruments involving a range of assessment activities and events • two-way communication and feedback • how judgement was exercised in making the assessment decision • how and when assessment outcomes were recorded and reported

	<ul style="list-style-type: none"> assessment records and reports completed in accordance with assessment system and organisational, legal and ethical requirements how the assessment process was reviewed.
Context of and specific resources for assessment	Evidence must be gathered in the workplace whenever possible. Where no workplace is available, a simulated workplace must be provided.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<i>Assessment plan</i> may include:	<ul style="list-style-type: none"> overall planning, describing: <ul style="list-style-type: none"> what is to be assessed when assessment is to take place where assessment is to take place how assessment is to take place.
<i>Benchmarks for assessment:</i>	<ul style="list-style-type: none"> refer to a criterion against which the candidate is assessed may be a competency standard/unit of competency, assessment criteria of course curricula, performance specifications, or product specifications.
<i>Assessment tools</i> include:	<ul style="list-style-type: none"> the learning or competency unit(s) to be assessed the target group, context and conditions for the assessment the tasks to be administered to the candidate an outline of the evidence to be gathered from the candidate the evidence criteria used to judge the quality of performance (i.e. the assessment decision-making rules) the administration, recording and reporting requirements the evidence of how validity and reliability have been tested and built into the design and use of the tool.

<i>Specialist support</i> may include:	<ul style="list-style-type: none"> • assistance by third party, such as carer or interpreter • support from specialist educator • provision of developed online assessment activities • support for remote or isolated candidates and assessors • support from subject matter or safety experts • advice from regulatory authorities • assessment teams and panels • support from lead assessors • advice from policy development experts.
<i>Assessment methods</i> include:	<ul style="list-style-type: none"> • particular techniques used to gather different types of evidence, such as: <ul style="list-style-type: none"> • direct observation • structured activities • oral or written questioning • portfolios of evidence • review of products • third-party feedback.
<i>Individual differences</i> may include:	<ul style="list-style-type: none"> • English language, literacy and numeracy barriers • physical impairment or disability • intellectual impairment or disability • medical condition that may impact on assessment, such as arthritis, epilepsy, diabetes and asthma • learning difficulties • mental or psychological disability • religious and spiritual observances • cultural images and perceptions • age • gender.
<i>Feedback</i> may include:	<ul style="list-style-type: none"> • ensuring assessment/RPL process is understood • ensuring candidate concerns are addressed • enabling questions and answers • confirming outcomes • identifying further evidence to be provided • discussing action plans • confirming gap training needed • providing information regarding available appeal processes • suggesting improvements in evidence gathering and

	presentation.
Consultation may involve:	<ul style="list-style-type: none">• moderation with other assessors, or training and assessment coordinators• discussions with client, team leaders, managers, RPL coordinators, supervisors, coaches and mentors• technical and subject experts• English language, literacy and numeracy experts.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS403B Participate in assessment validation

Modification History

Version	Comments
---------	----------

TAEASS403B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>
------------	--

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to participate in an assessment validation process.

Application of the Unit

This unit typically applies to those participating in assessment validation. It does not address leading the validation process.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
---------	----------------------

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

Elements and Performance Criteria

1. Prepare for validation	<p>1.1 Discuss and confirm the approach to validation according to defined purposes, context, and relevant <i>assessment system policies and procedures</i></p> <p>1.2 Analyse relevant <i>benchmarks for assessment</i> and agree on the evidence needed to demonstrate competence</p> <p>1.3 Arrange <i>materials</i> for <i>validation activities</i></p>
2. Contribute to validation process	<p>2.1 Demonstrate active <i>participation</i> in validation sessions and activities using appropriate communication skills</p> <p>2.2 Participate in validation sessions and activities by applying the principles of assessment and rules of evidence</p> <p>2.3 Check all documents used in the validation process for accuracy and version control</p>
3. Contribute to validation outcomes	<p>3.1 Collectively discuss validation findings to support improvements in the quality of assessment</p> <p>3.2 Discuss, agree and record recommendations to improve assessment practice</p> <p>3.3 Implement changes to own assessment practice, arising from validation</p>

Required Skills and Knowledge

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

Required skills

- planning skills to participate in validation activities within agreed timeframes
- problem-solving skills to identify information that is inconsistent, ambiguous or contradictory
- evaluation skills to:
 - determine evidence requirements from competency standards
 - review assessment process, tools and methods
 - review collected evidence
- communication skills to share information in validation meetings.

Required knowledge

- how to interpret competency standards and other related assessment information to determine the evidence needed to demonstrate competence, including:
 - criterion-referenced assessment as distinct from norm-referenced assessment

- various reasons for carrying out validation and the different approaches to validation that may be appropriate before, during and after assessment
- critical aspects of validation, including validation of assessment processes, methods and products
- relevant OHS legislation, codes of practice, standards and guidelines, impacting on assessment
- legal and ethical requirements of assessors, particularly in relation to validation activities
- principles of assessment
- rules of evidence.

Evidence Guide

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

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> • actively participate in a minimum of two validation sessions or meetings which, in combination, address the critical aspects of validation using different validation approaches and activities • clearly explain purposes of validation and the legal and ethical responsibilities of assessors • collate documentation relating to validation process in a logical manner • demonstrate communication and liaison with relevant people • provide feedback and interpret documentation in validation sessions • record contribution to validation findings.
Context of and specific resources for assessment	<p>Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.</p> <p>Assessment must ensure access to:</p> <ul style="list-style-type: none"> • assessment reports and records • other documentation relevant to validation.
Method of assessment	
Guidance information	

for assessment	
----------------	--

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<i>Assessment system policies and procedures</i> may include:	<ul style="list-style-type: none"> • candidate selection • rationale and purpose of competency-based assessment • assessment records, and data and information management • recognition of current competency, recognition of prior learning and credit arrangements • assessment reporting procedures • assessment appeals • candidate grievances and complaints • validation • evaluation and internal audit • costs and resourcing • access and equity, and reasonable adjustment • partnership arrangements • links with human resource or industrial relations system • links with overall quality management system.
<i>Benchmarks for assessment:</i>	<ul style="list-style-type: none"> • refers to criterion against which the candidate is assessed • may be one or more units of competency or assessment criteria of course curricula.
<i>Materials</i> may include:	<ul style="list-style-type: none"> • assessment tools • samples of collected evidence • documentation outlining the basis of assessment decisions • reports and records of assessment decisions • samples of benchmarks of appropriate evidence • Assessment Guidelines of the relevant training packages • information from the evidence guide of the relevant units of competency.
<i>Validation activities</i> may include:	<ul style="list-style-type: none"> • analysing and reviewing: <ul style="list-style-type: none"> • assessment tools • collected evidence • assessment decisions and records of assessment outcomes

	<ul style="list-style-type: none">• other aspects of assessment policies, processes and outcomes• recording evidence of validation processes and outcomes.
Participation may include comparison and evaluation of:	<ul style="list-style-type: none">• assessment practices• assessment plans• interpretation of units of competency• assessment methods and instruments• assessment decisions• collected evidence.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEASS502B Design and develop assessment tools

Modification History

Version	Comments
---------	----------

TAEASS502B	Released with <i>TAE10 Training and Education Training Package version 2.0</i>
------------	--

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to design and develop assessment tools, including tools used in formative, summative and recognition of prior learning (RPL) assessment.

Application of the Unit

An assessment tool is used to guide the collection of quality evidence in the assessment process. It includes the specific instruments for collecting evidence, as well as information about assessment methods and the procedures to be followed in conducting the assessment.

This unit typically applies to those involved in training and assessment or in the development of learning resources or products, assessors, learning resource or product developers, and training and assessment consultants.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
---------	----------------------

Elements describe the essential outcomes of a

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text

ELEMENT

unit of competency.

PERFORMANCE CRITERIA

is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1. Determine focus of the assessment tool	<p>1.1 Identify target group of candidates, purposes of assessment tool, and contexts in which the tool will be used</p> <p>1.2 Access relevant benchmarks for assessment and interpret them to establish evidence required to demonstrate competence</p> <p>1.3 Identify, access and interpret organisational, legal and ethical requirements and relevant contextualisation guidelines</p> <p>1.4 Identify other related documentation to inform assessment tool development</p>
2. Design assessment tool	<p>2.1 Select assessment methods that support the collection of defined evidence, taking into account the context in which the assessment will take place and meeting the principles of assessment</p> <p>2.2 Enable candidates to show or support their claim for recognition of current competency through selected assessment methods</p> <p>2.3 Consider different assessment instruments for the selected assessment methods to generate options for collection of evidence</p> <p>2.4 Consider how the assessment instruments will be administered</p>
3. Develop assessment tool	<p>3.1 Develop specific assessment instruments that address the evidence to be collected</p> <p>3.2 Define and document clear and specific procedures instructing assessor and candidate on the administration and use of the instruments</p> <p>3.3 Consider requirements of assessment system policies and procedures and address storage and retrieval needs, and review, evaluation and version control procedures as part of this process</p>
4. Review and trial assessment tool	<p>4.1 Check draft assessment tools against evaluation criteria and amend as required</p> <p>4.2 Trial assessment tools to validate content and applicability</p> <p>4.3 Collect and document feedback from relevant people involved in trialling</p> <p>4.4 Make amendments to final tool based on analysis of feedback</p>

	4.5 Appropriately format and file finalised assessment tool according to assessment system policies and procedures and organisational, legal and ethical requirements
--	---

Required Skills and Knowledge

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

Required skills

- analysis and interpretation skills to review and evaluate assessment tools
- critical thinking skills to translate the interpreted competency standards and other relevant assessment information into meaningful assessment instruments
- design skills to develop different assessment tool designs
- research and evaluation skills to evaluate assessment tools on the basis of trials and feedback.

Required knowledge

- principles of assessment and how they are applied when developing assessment tools
- different types and rules of evidence
- different assessment contexts and relationship to developing assessment tools
- components of competency and dimensions of competency
- contextualisation of competency standards and contextualisation guidelines
- Assessment Guidelines of training packages as relevant to developing assessment tools
- different assessment methods, their purposes and uses
- evaluation methodologies appropriate to the trial and review of assessment tools
- principles of reasonable adjustment
- relevant workplace information, including:
 - organisational policies and procedures
 - workplace tasks and activities
 - standard operating procedures
 - procedures for use of relevant personal protective equipment.

Evidence Guide

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

Overview of assessment	
-------------------------------	--

Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> develop assessment tools that support different assessment methods and address at least three units of competency packaged at different Australian Qualifications Framework (AQF) levels develop assessment tools that: <ul style="list-style-type: none"> include the instruments for collecting evidence, reflecting the principles of assessment and the rules of evidence, and the related instructions to assessor/s and candidates show how the contextual needs of different environments are addressed report on the trial and review of the assessment tools, including proposed changes.
Context of and specific resources for assessment	<p>Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.</p> <p>Assessment must ensure access to:</p> <ul style="list-style-type: none"> training products, such as training packages and accredited course documentation.
Method of assessment	
Guidance information for assessment	

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<p>Assessment tool includes:</p>	<ul style="list-style-type: none"> • the learning or competency unit(s) to be assessed • the target group, context and conditions for the assessment • the tasks to be administered to the candidate • an outline of the evidence to be gathered from the candidate • the evidence criteria used to judge the quality of performance (i.e. the assessment decision-making rules) • the administration, recording and reporting requirements • the evidence of how validity and reliability have been tested and built into the design and use of the tool.
<p>Contexts of assessment/RPL may include:</p>	<ul style="list-style-type: none"> • environment in which the assessment/RPL will be carried out, including real or simulated workplace • opportunities for collecting evidence in a number of situations • relationships between competency standards and evidence to support RPL • who carries out the assessment/RPL • relationships between competency standards and work activities in the candidate's workplace • relationships between competency standards and learning activities.
<p>Benchmarks for assessment:</p>	<ul style="list-style-type: none"> • refer to criteria against which the candidate is assessed which may be a unit of competency, assessment criteria of course curricula, performance specifications, or product specifications • where the benchmark is one or more units of competency the standards may be contextualised to reflect the immediate operating environment.
<p>Organisational, legal and ethical requirements may include:</p>	<ul style="list-style-type: none"> • assessment system policies and procedures • industrial relations systems and processes, awards and enterprise agreements • licensing and legal ramifications of assessing competence • reporting, recording and retrieval systems for assessment • requirements of training, assessment and validation, including the AQTF Standards for Registered Training Organisations • human resource policies, procedures and legal requirements, including: <ul style="list-style-type: none"> • anti-discrimination • equal employment opportunity • job role, responsibilities and conditions • relevant industry codes of practice • confidentiality and privacy requirements of information relating to completed assessments

	<ul style="list-style-type: none"> • OHS considerations, including: <ul style="list-style-type: none"> • ensuring assessment methods and tools incorporate appropriate measures to maintain the health, safety and welfare of candidates • ensuring OHS requirements and specified benchmarks are accounted for within evidence requirements and assessment materials • identifying hazards and relevant risk control procedures associated with the assessment environment.
Contextualisation guidelines relate to:	<ul style="list-style-type: none"> • relevant training package or accredited course contextualisation guidelines.
Related documentation may include:	<ul style="list-style-type: none"> • requirements set out in the Assessment Guidelines of the relevant training packages • information from the competency standards about: <ul style="list-style-type: none"> • resources required for assessment • assessment context • appropriate assessment methods • assessment activities identified in accredited modules derived from the relevant competency standards • assessment activities in support materials related to the relevant competency standards • any requirements of OHS, legislation, codes of practice, standards and guidelines • indicators and levels of competence of the Australian Core Skills Framework • organisational requirements for demonstration of work performance • product specifications.
Assessment instrument may be:	<ul style="list-style-type: none"> • profiles of acceptable performance measures • templates and proformas • specific questions or activities • evidence and observation checklists • checklists for the evaluation of work samples • recognition portfolios • candidate self-assessment materials.

<i>Procedures</i> may include:	<ul style="list-style-type: none"> • those that guide the application of the instruments, such as: <ul style="list-style-type: none"> • instructions for the candidates • instructions for administering the assessment tool, including resources needed to conduct assessment and the context for the use of tools • guidance for development or review of decision-making process • guidance on reasonable adjustments • specified variations or restrictions on the tools • rules for verifying assessment decisions • OHS requirements, for example, identified hazards in the assessment environment and appropriate controls and reporting mechanisms • information on access and equity considerations.
<i>Assessment system policies and procedures</i> may include:	<ul style="list-style-type: none"> • assessment records, and data and information management • recognition of current competency, RPL and credit arrangements • assessor needs, qualifications and maintenance of currency • assessment reporting procedures • assessment appeals • candidate grievances and complaints • validation • evaluation and internal audit • costs and resourcing • access and equity, and reasonable adjustment • partnership arrangements • links with human resource or industrial relations systems • links with overall quality management system.
<i>Evaluation criteria</i> may include:	<ul style="list-style-type: none"> • effectiveness and relevance to the competency standards • whether assessment tool is appropriate to selected assessment methods • whether assessment tool is appropriate to target group and assessment context • appropriateness of language and literacy for intended audience.

Unit Sector(s)

Assessment

Custom Content Section

Not applicable.

TAEDEL301A Provide work skill instruction

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit describes the performance outcomes, skills and knowledge required to conduct individual and group instruction and demonstrate work skills, using existing learning resources in a safe and comfortable learning environment. The unit covers the skills and knowledge required to determine the success of both the training provided and one's own personal training performance. It emphasises the training as being driven by the work process and context.
------------------------	--

Application of the Unit

Application of the unit	This unit supports a wide range of applications across any workplace setting and so can be used by any organisation. Its use is not restricted to training organisations.
--------------------------------	---

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.
----------------------	--

Elements and Performance Criteria Pre-Content

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

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Organise instruction and demonstration	1.1. Gather information about <i>learner characteristics</i> and learning needs 1.2. Confirm a <i>safe learning environment</i> 1.3. Gather and check <i>instruction and demonstration objectives</i> and seek assistance if required 1.4. Access and review relevant <i>learning resources</i> and <i>learning materials</i> for suitability and relevance, and seek assistance to interpret the contextual application 1.5. Organise access to necessary equipment or physical resources required for instruction and demonstration 1.6. Notify learners of <i>details</i> regarding the implementation of the learning program and/or delivery plan
2. Conduct instruction and demonstration	2.1. Use interpersonal skills with learners to establish a safe and comfortable learning environment 2.2. Follow the learning program and/or delivery plan to cover all learning objectives 2.3. Brief learners on any <i>OHS procedures</i> and requirements prior to and during training 2.4. Use <i>delivery techniques</i> to structure, pace and enhance learning 2.5. Apply <i>coaching</i> techniques to assist learning 2.6. Use communication skills to provide information,

ELEMENT	PERFORMANCE CRITERIA
	<p>instruct learners and demonstrate relevant work skills</p> <p>2.7. Provide opportunities for practice during instruction and through work activities</p> <p>2.8. Provide and discuss feedback on learner performance to support learning</p>
3. Check training performance	<p>3.1. Use <i>measures</i> to ensure learners are acquiring and can use new technical and generic skills and knowledge</p> <p>3.2. Monitor learner progress and outcomes in consultation with learner</p> <p>3.3. Review relationship between the trainer/coach and the learner and adjust to suit learner needs</p>
4. Review personal training performance and finalise documentation	<p>4.1. Reflect upon personal performance in providing instruction and demonstration, and document strategies for improvement</p> <p>4.2. Maintain, store and secure learner records according to organisational and legal requirements</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- verbal and non-verbal communication techniques, such as:
 - asking relevant and appropriate questions
 - providing explanations
 - demonstrating
 - using listening skills
 - providing information clearly
- safety skills to implement OHS requirements, by acting and responding safely in order to:
 - identify hazards
 - conduct prestart-up checks if required
 - observe and interpret learner behaviour that may put people at risk
- time-management, skills to:

REQUIRED SKILLS AND KNOWLEDGE

- ensure all learning objectives are covered
- pace learning
- reflection skills in order to:
 - identify areas for improvement
 - maintain personal skill development
- literacy skills to:
 - complete and maintain documentation
 - read and follow learning programs and plans
 - read and analyse learner information
- technology skills to operate audio-visual and technical equipment
- interpersonal skills to:
 - engage, motivate and connect with learners
 - provide constructive feedback
 - maintain appropriate relationships
 - establish trust
 - use appropriate body language
 - maintain humour
 - demonstrate tolerance
 - manage a group
 - recognise and be sensitive to individual difference and diversity
- observation skills to:
 - monitor learner acquisition of new skills, knowledge and competency requirements
 - assess learner communication and skills in interacting with others
 - identify learner concerns
 - recognise learner readiness to take on new skills and tasks

Required knowledge

- learner characteristics and needs
- content and requirements of the relevant learning program and/or delivery plan
- sources and availability of relevant learning resources and learning materials
- content of learning resources and learning materials
- training techniques that enhance learning and when to use them
- introductory knowledge of learning principles and learning styles
- key OHS issues in the learning environment, including:
 - roles and responsibilities of key personnel
 - responsibilities of learners
 - relevant policies and procedures, including hazard identification, risk assessment, reporting requirements, safe use of equipment and emergency

REQUIRED SKILLS AND KNOWLEDGE

- procedures
- risk controls for the specific learning environment

Evidence Guide**EVIDENCE GUIDE**

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

Overview of assessment

Assessment must address the scope of this unit and reflect all components of the unit. A range of appropriate assessment methods and evidence-gathering techniques must be used to determine competency. A judgement of competency should only be made when the assessor is confident that the required outcomes of the unit have been achieved and that consistent performance has been demonstrated.

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

Evidence of the ability to:

- carry out a minimum of three training sessions, involving demonstrating and instructing particular work skills for different groups; with each session addressing:
 - different learning objectives
 - a range of techniques and effective communication skills appropriate to the audience.

Context of and specific resources for assessment

Evidence must be gathered in the workplace wherever possible. Where no workplace is available, a simulated workplace must be provided.

Method of assessment**Guidance information for assessment**

For further information about assessment of this and other TAE units, refer to relevant implementation guidance published on the IBSA website (www.ibsa.org.au).

Range Statement**RANGE STATEMENT**

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<i>Learner characteristics</i> may include:	<ul style="list-style-type: none"> • language, literacy and numeracy levels • learning styles • past learning and work experiences • specific needs • workplace culture.
<i>Safe learning environment</i> may include:	<ul style="list-style-type: none"> • exit requirements • personal protective equipment • safe access • safe use of equipment.
<i>Instruction and demonstration objectives</i> may include:	<ul style="list-style-type: none"> • competencies to be achieved • generic and technical skills, which may be: <ul style="list-style-type: none"> • provided by the organisation • developed by a colleague • individual or group objectives • learning outcomes.
<i>Learning resources</i> may include:	<ul style="list-style-type: none"> • any material used to support learning, such as: <ul style="list-style-type: none"> • learner and user guides • trainer and facilitator guides • example training programs • specific case studies • professional development materials • assessment materials • a variety of formats • those produced locally • those acquired from other sources.
<i>Learning materials</i> may include:	<ul style="list-style-type: none"> • handouts for learners • materials sourced from the workplace, e.g. workplace documentation, operating procedures, and specifications.
<i>Details</i> may include:	<ul style="list-style-type: none"> • location and time • outcomes of instruction or demonstration • reason for instruction or demonstration • who will be attending instruction session.

RANGE STATEMENT	
<i>OHS procedures</i> may include:	<ul style="list-style-type: none"> • emergency procedures • hazards and their means of control • incident reporting • use of personal protective equipment • safe work practices • safety briefings • site-specific safety rules.
<i>Delivery techniques</i> may include:	<ul style="list-style-type: none"> • coaching • demonstration • explanation • group or pair work • providing opportunities to practise skills and solve problems • questions and answers.
<i>Coaching</i> may include:	<ul style="list-style-type: none"> • learning arrangements requiring immediate interaction and feedback • on-the-job instruction and 'buddy' systems • relationships targeting enhanced performance • short-term learning arrangements • working on a one-to-one basis.
<i>Measures</i> may include:	<ul style="list-style-type: none"> • informal review or discussion • learner survey • on-the-job observation • review of peer coaching arrangements.

Unit Sector(s)

Unit sector	Delivery and facilitation
--------------------	---------------------------

Competency field

Competency field	
-------------------------	--

Co-requisite units

Co-requisite units		

TLIC3003A Drive medium rigid vehicle

Modification History

Not Applicable

Unit Descriptor

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. Licensing, legislative, regulatory or certification requirements are applicable to this unit.

Application of the Unit

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

Employability Skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1 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

ELEMENT	PERFORMANCE CRITERIA
3 Monitor and maintain vehicle performance	or damage to property, equipment, loads and facilities
	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

REQUIRED KNOWLEDGE AND SKILLS

- 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

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/or other simulated practical and knowledge assessment, and/or
 - access to an appropriate range of relevant operational situations in the workplace
- In both real and simulated environments, access is required to:
 - relevant and appropriate materials and equipment, and
 - applicable documentation including workplace procedures, regulations, codes of practice and operation manuals

Method of assessment

- Assessment of this unit must be undertaken by a registered training organisation
- As a minimum, assessment of knowledge must be conducted through appropriate written/oral tests
- Practical assessment must occur:
 - through activities in an appropriately simulated environment at the registered training organisation, and/or
 - in an appropriate range of situations in the workplace

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

- | | |
|---|--|
| Type of vehicle includes: | <ul style="list-style-type: none">• 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: | <ul style="list-style-type: none">• 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: | <ul style="list-style-type: none">• 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: | <ul style="list-style-type: none">• 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: | <ul style="list-style-type: none">• 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): | <ul style="list-style-type: none">• wet and iced roads• oil on road• animals and objects on road• fire in vehicle• leaking fuel |

RANGE STATEMENT

Factors that can cause traffic delays and diversions may include:

- 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
- 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

Competency Field C - Vehicle Operation

TLIC3004A Drive heavy rigid vehicle

Modification History

Not Applicable

Unit Descriptor

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. Licensing, legislative, regulatory or certification requirements are applicable to this unit.

Application of the Unit

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

Employability Skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1 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 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

ELEMENT	PERFORMANCE CRITERIA
3 Monitor and maintain vehicle performance	upon to enable safe operation and ensure no injury to people or damage to property, equipment loads and facilities
	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

REQUIRED KNOWLEDGE AND SKILLS

- 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

EVIDENCE GUIDE

EVIDENCE GUIDE

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

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

- The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria of this unit and include demonstration of applying:
 - the underpinning knowledge and skills
 - relevant legislation and workplace procedures
 - other relevant aspects of the range statement

Context of and specific resources for assessment

- Performance is demonstrated consistently over a period of time and in a suitable range of contexts
- Resources for assessment include:
 - a range of relevant exercises, case studies and/or other simulated practical and knowledge assessment, and/or
 - access to an appropriate range of relevant operational situations in the workplace
- In both real and simulated environments, access is required to:
 - relevant and appropriate materials and equipment, and
 - applicable documentation including workplace procedures, regulations, codes of practice and operation manuals

Method of assessment

- Assessment of this unit must be undertaken by a registered training organisation
- As a minimum, assessment of knowledge must be conducted through appropriate written/oral tests
- Practical assessment must occur:
 - through activities in an appropriately simulated environment at the registered training organisation, and/or
 - in an appropriate range of situations in the workplace

Range Statement

RANGE STATEMENT

RANGE STATEMENT

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: | <ul style="list-style-type: none">• 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: | <ul style="list-style-type: none">• 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: | <ul style="list-style-type: none">• 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: | <ul style="list-style-type: none">• 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: | <ul style="list-style-type: none">• 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): | <ul style="list-style-type: none">• wet and iced roads• oil on road• animals and objects on road• fire in vehicle• leaking fuel• faulty brakes |

RANGE STATEMENT

	<ul style="list-style-type: none">• 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:	<ul style="list-style-type: none">• 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:	<ul style="list-style-type: none">• company procedures• enterprise procedures• organisational procedures• established procedures
Documentation/records may include:	<ul style="list-style-type: none">• 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 procedures including preoperational checks of vehicle• emergency procedures• vehicle log book or record book (where required)• relevant standards and certification requirements• quality assurance procedures
Applicable procedures and codes may include:	<ul style="list-style-type: none">• relevant state/territory roads and traffic authority driving regulations and licence/permit requirements pertaining to

RANGE STATEMENT

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

Competency Field C - Vehicle Operation

TLID2010A Operate a forklift

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor

This unit involves the skills and knowledge required to operate a forklift, including checking forklift condition, driving the forklift to fulfil operational requirements, monitoring site conditions, and monitoring and maintaining forklift performance. Assessment of this unit will usually be undertaken within a licensing examination conducted by, or under the authority of, the relevant state/territory OH&S authority. Licensing, legislative, regulatory or certification requirements are applicable to this unit.

Application of the Unit

Application of the Unit

Operation of a forklift must be carried out in compliance with the licence requirements and regulations of the relevant state/territory authority.

Operation of a forklift is performed under some supervision, generally within a team environment. It involves the application of routine equipment operation principles and procedures to maintain the safety and operation of a forklift in a variety of operational contexts.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

Employability Skills Information

Employability Skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

- | | |
|---|---|
| 1 Check forklift condition | 1.1 Condition of forklift is checked for compliance with OH&S and workplace requirements for warning devices, manufacturers specifications and the nature of the load shifting task
1.2 Attachments are checked to ensure appropriate adjustment and operation
1.3 Mirrors and seats are adjusted for safe operation by the driver
1.4 Log books are checked and appropriate workplace documentation is completed in accordance with workplace requirements |
| 2 Drive the forklift | 2.1 Forklift is started, steered, manoeuvred, positioned and stopped in accordance with regulations and manufacturers instructions
2.2 Engine power is managed to ensure efficiency and performance and to minimise engine and gear damage
2.3 Operational hazards are identified and/or anticipated and avoided or controlled through defensive driving and appropriate hazard control techniques
2.4 Forklift is driven in reverse, maintaining visibility and achieving accurate positioning
2.5 The forklift is parked, shut down and secured in accordance with manufacturers specifications, regulations and workplace procedures |
| 3 Operate a forklift to handle loads | 3.1 The lifting task to be undertaken is appropriately planned and the correct lifting truck and attachments are selected
3.2 The load is lifted, carried, lowered and set down in accordance with OH&S legislation, manufacturers specifications and company procedures |

ELEMENT	PERFORMANCE CRITERIA
4 Monitor site conditions	4.1 When selecting the most efficient route, hazards and traffic flow are identified and appropriate adjustments are made 4.2 Site conditions are assessed to enable safe operations and to ensure no injury to people or damage to property, equipment, loads or facilities occurs
5 Monitor and maintain forklift performance	5.1 Performance and efficiency of vehicle operation is monitored during use 5.2 Defective/irregular performance and malfunctions reported to relevant personnel 5.3 Forklift records are maintained/updated in accordance with workplace procedures and legislative requirements

Required Skills and Knowledge

REQUIRED KNOWLEDGE AND SKILLS

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

Required knowledge:

- Relevant duty of care requirements pertaining to the operation of a forklift
- Relevant OH&S and environmental procedures and regulations
- Workplace operating procedures
- Forklift controls, instruments and indicators and their use
- Forklift handling procedures
- Procedures to be followed in the event of an operational emergency
- Engine power management and safe operating strategies
- Efficient driving techniques
- Operating hazards and related defensive driving and hazard control techniques
- Pre-operational checks carried out on forklift and related action
- Principles of stress management when driving a forklift
- Site layout and obstacles

Required skills:

- Communicate effectively with others when operating a forklift
- Read and interpret instructions, procedures, information and signs relevant to the operation of a forklift

Required skills:

- Interpret and follow operational instructions and prioritise work
- Complete documentation related to the operation of a forklift
- Operate electronic communication equipment to required protocol
- Work collaboratively with others when operating a forklift
- Adapt appropriately to cultural differences in the workplace, including modes of behaviour and interactions with others
- Promptly report and/or rectify any identified problems, faults or malfunctions in accordance with regulatory requirements and workplace procedures
- Implement contingency plans for unexpected events when operating a forklift
- Apply precautions and required action to minimise, control or eliminate hazards that may exist during the operation of a forklift
- Monitor work activities in terms of planned schedule
- Modify activities depending on differing operational contingencies, risk situations and environments
- Apply fatigue management knowledge and techniques
- Work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- Operate and adapt to differences in equipment in accordance with standard operating procedures
- Select and use required personal protective equipment conforming to industry and OH&S standards
- Identify points of balance and safe lifting positions on a range of loads when operating a forklift (including accessories)
- Monitor performance of forklift and its equipment and take appropriate action where required
- Ensure that a forklift and its equipment are maintained in terms of service schedule and standard operating procedures
- Check and replenish fluids and carry out lubrication processes in the course of work activities

Evidence Guide**EVIDENCE GUIDE**

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

Critical aspects for assessment and evidence required to

- The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the

EVIDENCE GUIDE

demonstrate competency in this unit

requirements of the elements and performance criteria of this unit and include demonstration of applying:

- the underpinning knowledge and skills
- relevant legislation and workplace procedures
- other relevant aspects of the range statement

Context of and specific resources for assessment

- Performance is demonstrated consistently over a period of time and in a suitable range of contexts
- Resources for assessment include:
 - a range of relevant exercises, case studies and/or other simulated practical and knowledge assessment, and/or
 - access to an appropriate range of relevant operational situations in the workplace
- In both real and simulated environments, access is required to:
 - relevant and appropriate materials and equipment, and
 - applicable documentation including workplace procedures, regulations, codes of practice and operation manuals

Method of assessment

- Assessment of this unit must be undertaken by a registered training organisation
- As a minimum, assessment of knowledge must be conducted through appropriate written/oral tests
- Practical assessment must occur:
 - through activities in an appropriately simulated environment at the registered training organisation, and/or
 - in an appropriate range of situations in the workplace

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

Types of forklift may include:

- counterbalance trucks
- reach trucks
- pallet trucks

RANGE STATEMENT

Operations may be carried out in typical forklift operational situations, including:	<ul style="list-style-type: none">• 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:	<ul style="list-style-type: none">• internal or external
Workplaces may comprise:	<ul style="list-style-type: none">• large, medium or small worksites
Work may be conducted in:	<ul style="list-style-type: none">• restricted spaces• exposed conditions• controlled or open environments
Loads to be shifted may require:	<ul style="list-style-type: none">• special precautions
Loads to be shifted may be:	<ul style="list-style-type: none">• irregularly shaped• packaged or unpackaged• labelled or unlabelled• palletted or unpalletted
Hazards in the work area may include exposure to:	<ul style="list-style-type: none">• chemicals• dangerous or hazardous substances• movements of equipment, goods and materials
Personnel in the work area may include:	<ul style="list-style-type: none">• workplace personnel• site visitors• contractors• official representatives
Forklift handling procedures may include:	<ul style="list-style-type: none">• 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:	<ul style="list-style-type: none">• 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):	<ul style="list-style-type: none">• wet and iced operating surfaces• oil on operating surface

RANGE STATEMENT

	<ul style="list-style-type: none">• 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:	<ul style="list-style-type: none">• company procedures• enterprise procedures• organisational procedures• established procedures
Personal protection equipment may include:	<ul style="list-style-type: none">• gloves• safety headwear and footwear• safety glasses• two-way radios• high visibility clothing
Information/documents may include:	<ul style="list-style-type: none">• 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:	<ul style="list-style-type: none">• relevant state/territory regulations pertaining to the operation of forklifts• relevant codes and standards, including Australian Standard 2359 - Industrial Truck Code• relevant state/territory OH&S legislation• relevant state/territory fatigue management regulations• relevant state/territory environmental protection legislation

Unit Sector(s)

Not Applicable

Competency Field

Competency Field	D - Load Handling
------------------	-------------------