Manufacturing Learning Australia

PMA02 — Volume 2

Competency Standards

for the

PMA02 Chemical, Hydrocarbons and Oil Refining Training Package

Volume 2 of a two-volume set which comprises the Endorsed Component of the Training Package

Volume 1
Structure and Guidance;
Core and Support Competencies (series 100 to 300)
Volume 2
Competency Standards: Operations Competencies;
Support Competencies (series 400 to 600)

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Training Packages are not static documents. Changes are made periodically to reflect the latest industry practices.

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PMA02 Print version modification history

MODIFICATION HISTORY — ENDORSED MATERIALS

Please refer to the National Training Information Service for the latest version of units of competency and Qualification information (http://www.ntis.gov.au).

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Version	Date of Release	Authorisation	Comments
3	To be confirmed	DEST	Addition of 9 new elective production units of competency for aluminium smelting. The new units are coded "PMASMELT" – refer page v for list of units and relevant certificates. The units have also been added to the mapping tables. Reference to 'Statement of Attainment in Contractor Safety' has also been removed for List of Qualifications and advice in the Qualifications Framework.
2	01/06/2004	ANTA	Addition of suite of new elective support units of competency for on/offshore and Major Hazard Facility incident response: 20 new units coded 'PMAOMIR'; revisions to 6 'PMAOHS' units; 3 Public Safety units (imported); deletion of unit PMAOHS217A Monitor hazardous atmospheres which is replaced by PMAOMIR217A Gas test atmospheres. (Refer below — p. v [Vol 1] for the list of units and relevant certificates.) Prerequisites for PMAOPS312A Undertake ship loading/unloading operations corrected to read 'PMAOPS201A Operate particulates handling equipment OR PMAOPS222A Operate and monitor pumping systems and equipment OR PMAOPS223A Operate and monitor valve systems' Corrections and clarifications in the mapping tables.
1	31/03/2004	ANTA	The pre-requisite for PMASUP600B Modify plant has been corrected to read PMASUP540A Analyse equipment performance. PMASUP421A Review procedures to minimise environmental impact of process incorrectly remained in the Training Package despite the intention for it to be deleted before publication. Reference to PMASUP421A has been deleted throughout. The codes for the following 3 units have been corrected to A versions throughout: BSATEM101A Participate in a team to achieve designated tasks. BSATEM201A Participate in allocation and completion of team tasks BSATEM301A Negotiate with team members to allocate and complete tasks to achieve team goals
1	10/12/2003	ANTA	Update of OHS content of 24 units, resulting in version changes to the units. These updated versions now appear throughout the Training Package: PMAOHS100B Follow OHS procedures PMAOHS110B Respond to emergency situation PMAOHS200B Participate in workplace safety procedures PMAOHS300B Implement and monitor OHS policies and procedures for a workgroup PMAOHS400B Contribute to workplace OHS management system PMAOHS401B Assess risk PMAOHS510B Manage risk PMAOPS101B Read dials and indicators PMAOPS105B Select and prepare materials PMAOPS401B Trial new process/product PMAOPS520B Manage utilities PMAOPS521B Plan plant shutdown PMAOPS600B Modify plant PMAPER200C Work in accordance with an issued permit

			PMAPER201C Monitor and control work permits PMAPER205B Enter confined space PMAPER300C Issue work permits PMAPER302B Issue work permits (hot work/ confined space) PMASUP100B Apply workplace procedures PMASUP130B Follow established work plan PMASUP200B Implement production efficiencies PMASUP300B Identify and implement opportunities to maximise production efficiencies PMASUP330B Schedule production PMASUP441B Decommission plant Inclusion of 2 new units to replace three units. PMAOHS503A Maintain workplace OHS management system replaces: PMAOHS500A Manage workplace OHS management system PMAOHS501A Evaluate and improve workplace OHS management system PMAOHS601A Establish workplace OHS management system replaces: PMAOHS600A Ensure a safe workplace Correction of typos in several units, especially: PMAOPS211A Operate manufacturing extruders — Element 8 Respond to prime mover problems changed to Respond to extruder problems. PMAOPS213A Package product/material — Element 5 Respond to prime mover problems changed to Respond to packaging plant/process problems. PMAOPS307A Transfer bulk fluids into/out of storage facility — Element 6 Respond to problems changed to Resolve problems PMAOPS308A Organise storage and logistics of general materials — Element 4 Respond to problems changed to Resolve problems PMAOPS309A Operate particulates handling/storage equipment — Element 7 Respond to problems changed to Resolve problems PMAOPS321A Undertake well management — Element 7 Respond to problems changed to Resolve problems PMAOPS390A Operate a biochemical process — Element 7 Respond to problems changed to Resolve problems
1.00	9/12/2002	NTQC	Primary Release (note Fully revised version of PMA98)

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Operations Competencies

for the

PMA02 Chemical, Hydrocarbons and Oil Refining Training Package

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Unit title

PMAOPS100A Use equipment to procedures

Unit descriptor

This competency covers the operation of items of equipment (including packaged equipment), where the operator has a limited knowledge of the operating principles of the equipment.

In a typical situation the operator may be using a packaged chilled water refrigeration unit to supply chilled water top the plant. The operator uses this packaged chiller by using simple controls (eg, on, off and temperature setting) and responds to fault alarms built into the unit (eg, machine fault or shutdown). Even though the equipment is very sophisticated and uses high speed compressors and computerised vibration and measuring equipment, the operator interface is relatively simple. This competency covers such equipment use.

The operator therefore needs to be able to respond to alarms and recognise obvious situations where the equipment is not performing correctly and to take appropriate routine and predetermined remedial action to procedures, which could include:

- rectifying those problems within the operator's scope of responsibility and skill level
- reporting problems in a timely manner to appropriate personnel
- identifying hazards in their work area and taking appropriate remedial action to control risks arising from the hazards.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This competency is performed by operators at any level.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Follow workplace procedures.	1.1 Find out work requirements 1.2 Identify and follow procedures 1.3 Report as required 1.4 Recognise and report anything unusual.
2. Monitor and operate the equipment/process.	2.1 Turn the equipment on and off as required 2.2 Monitor equipment frequently throughout shift using measured/indicated data and senses as appropriate 2.3 Recognise non-standard performance 2.4 Take corrective action to procedures.
3. Contribute to controlling hazards.	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.

Range of variables

Context

Typical equipment in your plant covered by this competency, regardless of the engineering sophistication, could include (select relevant items):

- compressors (packaged plant)
- refrigeration (packaged plant)
- fans
- blowers
- other equipment similar to the above that is specific to your plant.

Resolution of equipment problems is restricted to responding in a routine, predetermined manner as specified in the procedures for your plant. All operations are performed to procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this competency unit (eg, element 2). 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

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 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 typical problems.

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Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOHS100C Follow OHS procedures.
- PMAOPS101A Make measurements and
- PMAOPS102A Undertake housekeeping operations.

Essential knowledge

Demonstration of competence in this unit must include knowledge of the following:

- basic understanding of the role of the equipment being operated
- procedures related to this competency
- typical non-conformances in equipment operation or equipment output
- procedures for reporting or dealing with typical equipment problems.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	X	1	X	1	1

Unit title

PMAOPS101B Read dials and indicators

Unit descriptor

This competency covers making (or taking) readings/measurements in a variety of sites and locations, using common types of plant instrumentation. This competency unit also covers recording measurement results. This would typically be in a format according to procedures, with the appropriate level of detail included in all reports.

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.

Prerequisites

This unit **has no** prerequisites.

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.

Range of variables

Context

Typical dials and indicators include (select relevant items):

- analog dials, eg
    - pressure gauge
    - rev counter
    - temperature dial
- digital readouts, eg
    - pH meter
    - temperature probe

- ammeter
- flow meter
- weigh scales.

Calibration checks could include:

- checking the date that the next calibration is required (eg, weigh scale, pressure gauge)
- using a calibration button on the instrument (eg, zero button on an ammeter, calibration button on an electronic meter).

Resolution of equipment problems or non-conforming measurements/readings is restricted to responding in a routine, predetermined manner as specified in the procedures for your plant. All operations are performed to procedures.

Readings may need to be made at heights, in wet or restricted conditions, or close to hot or moving equipment.

Taking action may be reporting.

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.

Evidence guide

Assessment context and methods

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

Simulation or case study/scenarios may be required to allow for timely assessment of parts of this competency unit (eg, those parts of element 2 referring to out of range readings). 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

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 and the appropriate priority for response for such readings.

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

- readings which are out of range or unusual/unexpected signs of problems or potential problems with the equipment/processes are recognised
- appropriate action is taken in a timely manner
- hazards are recognised and appropriate action is taken to control risks arising from such hazards.

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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.

Resource implications

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.

Other assessment advice

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:

- PMAOHS100C Follow OHS procedures.

Essential knowledge

Demonstration of competence in this unit must include knowledge of the following:

- basic units of measurement
- measuring devices, including gauges, dip-sticks, thermometers and the like
- graphs and scales
- procedures 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.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	X	1	1	1	1

Unit title

PMAOPS102A Undertake housekeeping operations

Unit descriptor

This competency covers the skills needed to undertake a range of housekeeping operations in a variety of sites and facilities. It is typically part of the job for all operators/technicians.

Housekeeping operations are fundamental to most plants and typically include:

- cleaning and maintaining work areas
- disposing of waste materials
- assisting in unplanned cleaning operations such as minor spills or other incidents.

This competency does not require technical skills related to the operation of the plant, but it does require the operator to recognise non-standard situations and to take action to procedures, which would typically include reporting a situation in a timely manner to the appropriate personnel.

In particular, this competency requires operators to recognise and report situations that are potentially hazardous or likely to reduce the overall safety of the plant. It also requires the operator to understand and follow workplace OHS requirements.

Therefore, the main emphasis of this competency is the ability to perform housekeeping operations to procedures and OHS requirements, coupled with the ability to recognise a range of situations that could affect the safety and efficient operation of the plant.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Identify housekeeping requirements.	1.1 Explain site safety and housekeeping requirements 1.2 Undertake housekeeping inspection to procedures 1.3 Identify and schedule housekeeping requirements as appropriate.
2. Perform housekeeping operations.	2.1 Select and check housekeeping equipment and materials 2.2 Perform housekeeping operations to procedures 2.3 Keep work area in a clean and safe condition.
3. Dispose of waste materials.	3.1 Correctly identify waste materials 3.2 Dispose of materials in correct locations to procedures.
4. Contribute to controlling hazards.	4.1 Identify hazards in work area 4.2 Assess risks arising from those hazards 4.3 Take appropriate action to control risks to procedures and duty of care.
5. Report as required.	5.1 Fill in all relevant documentation 5.2 Identify and report improvements to housekeeping as appropriate.

Range of variables

Context

This competency is typically performed by all operators and includes the following:

- planned operations including routine checks and inspections
- unplanned operations, such as minor spills and containment
- disposal of waste materials
- identifying and reporting hazards, safety and other issues that could affect the operation of the plant.

Equipment and supplies may include:

- cleaning equipment and materials
- brooms
- shovels
- cleaning agents/solvents
- waste containers
- safety equipment.

All operations are performed to procedures.

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.

Evidence guide

Assessment context and methods

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

Critical aspects

Competence must be demonstrated in the ability to perform housekeeping operations, and to recognise and report obvious situations that require corrective action. Consistent performance should be demonstrated. In particular look to see that:

- housekeeping operations are performed to procedures,
- 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.

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Resource implications

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.

Other assessment advice

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:

- PMAOHS100C Follow OHS procedures.

Essential knowledge

Demonstration of competence in this unit must include knowledge of the following:

- safe handling procedures
- workplace OHS requirements
- duty of care
- products and materials used in the housekeeping process
- procedures 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
- procedures for reporting or dealing with non-standard or hazardous situations.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	X	1	X	1	1

Unit title

PMAOPS105B Select and prepare materials

Unit descriptor

This competency covers the selection and preparation of materials for use in production processes. The focus of this unit is on finding and delivering the right materials to the process in the right condition. On the way, some minor preparation may be required.

A typical application of this competency could be an operator preparing a range of chemicals or other substances for use in a batch process. The operator would visually inspect each item for deterioration or damage, and follow procedures to prepare materials. Once prepared, the operator would then assemble the materials for supply to production areas.

This unit only covers those situations where mixing, grinding, testing, etc, are an incidental part of the process of preparing materials for use in production. It does **not** cover those situations where the primary function is mixing, grinding, testing, etc. Instead see:

- PMAOPS202A Operate fluid mixing equipment
- PMCOPS203A Operate grinding equipment

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.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Identify and locate materials.	1.1 Identify material requirements correctly from documentation 1.1 Identify type, quantity and quality of materials 1.2 Identify material hazards and handling procedures from: • label • hazchem symbol • MSDS • other relevant source 1.3 Locate and check materials to procedures 1.4 Confirm availability of required quantity of materials 1.5 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.

Element	Performance criteria
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
	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.

Range of variables

Context

This competency is typically performed by operators, weighers, mixers or stores personnel, and includes the following tasks (select relevant items):

- handling raw chemicals
- storing raw chemicals
- pre-production assembling and labelling of materials
- pre-production inspection of materials, usually involving visual inspections only for identification of deterioration or damage
- pre-production measuring of materials, by weight, volume or density
- disposal of waste materials
- identifying and reporting hazards, safety and other issues that could affect the operation of the plant.

Typical examples of preparation required might include (select relevant items):

- warming to melt waxy materials
- breaking up solid materials into pieces or smaller lumps
- passing materials through an in-line delumper
- blending a powder or liquid into a solution prior to use in the process
- blending powders prior to production
- dilution of solutions
- preparation of a solution for dosing into a process.

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Equipment may include:

- buckets
- stirring paddle
- propeller or drum mixers
- delumpers
- hammers or axes
- measuring equipment including scales, flow meters and graduated vessels
- personal protective equipment

Documentation may include:

- materials safety data sheets (MSDSs)
- enterprise procedures
- labelling requirements (dangerous goods codes, classification numbers, packaging group numbers)
- HAZCHEM symbols and codes
- spill containment and disposal procedures.

Materials may include:

- raw materials
- packaging materials
- consumables.

Typical problems are restricted to responding in a routine, predetermined manner as specified in the procedures.

All operations are performed to procedures.

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.

Evidence guide

Assessment context and methods

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

Critical aspects

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.

Resource implications

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.

Other assessment advice

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:

- PMAOHS100C Follow OHS procedures.

Essential knowledge

Demonstration of competence in this unit must include knowledge of the following:

- identification of materials in plant
- classes of compatible and incompatible chemicals
- storage requirements of materials
- any special storage requirements
- basic measurement procedures
- routes of entry of chemicals to the body (basic only)
- procedures for safe handling 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
- spill containment and disposal procedures
- procedures 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)

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.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	X	1	1	1	1

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Unit title

FDFCORGMP1A Apply basic good manufacturing practice

Unit descriptor

This unit involves applying the relevant sections of the Code of Good Manufacturing Practice (GMP). In PMA02 it is only relevant to processes manufacturing goods subject to the Therapeutic Goods Act or other similar food or pharmaceutical related processes.

Element	Performance criteria
1. Apply the GMP requirements in immediate work area.	1.1 Personal hygiene complies with good manufacturing practice 1.2 Personal movement around the workplace complies with work area standards 1.3 Clothing is prepared, used, stored and disposed according to good manufacturing practice 1.4 Stock and equipment is handled and used according to good manufacturing practice 1.5 GMP non-compliance is identified, rectified and/or reported.
2. Control contamination	2.1 Pharmaceutical products are free of contamination 2.2 The risk of contamination is minimised by the application of good manufacturing practice 2.3 Contamination is detected and reported within standard procedures.
3. Implement GMP documentation	3.1 Documentation supporting GMP requirements is used as specified.

Range of variables

The range of variables provides further advice to interpret the scope and context of this unit of competence.

It assumes:

- work is carried out within company policy and procedures, good manufacturing practice and legislative requirements
- responsibility for applying good manufacturing practice relates to the person's work area
- stock handled by the operator may include raw materials, ingredients, consumable products, finished product
- reporting systems may include electronic and manual data recording and storage systems.

Evidence guide

The evidence guide identifies the skills and knowledge to be demonstrated to confirm competence for this unit. It should be read in conjunction with the range of variables.

Demonstrated ability to:

- apply GMP provisions for personal hygiene
- apply GMP provisions for movement about the workplace
- identify GMP non-compliance
- comply with entry and exit requirements for moving through designated work areas/sections
- implement GMP provisions regarding control of contamination
- identify documentation in person's work area which contains GMP provisions
- implement GMP provisions related resources and process control
- implement documentation as specified
- report/record GMP non-compliance.

Underpinning knowledge:

- purpose and significance of compliance with the Code of Good Manufacturing Practice
- the relationship between the Code of Good Manufacturing Practice and standard operating procedures, instructions, processes and procedures
- role/responsibility/accountability of operator in implementing GMP
- the quality characteristics in pharmaceutical manufacturing
- the relationship between quality and good manufacturing practice
- the purpose of documentation systems and processes
- clothing requirements
- actual/potential implications of breaching GMP requirements
- systems and processes for reporting non-compliance with GMP
- roles and responsibilities of external audit groups in monitoring and reporting GMP compliance
- types of contamination
- causes of contamination
- methods of preventing contamination
- reporting/recording systems and processes.

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Unit title

PMAOPS200A Operate an item of equipment

Unit descriptor

This competency covers the operation of a unit of equipment which is not covered by another specific competency in this Training Package.

The operator would:

- be aware of and contribute to a safe working environment
- identify and report operational problems to their supervisor/control room operator
- contribute to plant optimisation
- execute all routine activities including process monitoring, sampling, planning and maintenance (in accordance with position description).

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Start up an item of equipment	1.1 Perform pre-start up checks 1.6 Liaise with other team members and control room operator on the intended function 1.7 Start up the item of equipment normally and after maintenance 1.8 Build operating rate steadily, checking expected performance at various stages 1.9 Bring to specified conditions within specified time.
2. Monitor equipment operation.	2.1 Monitor and observe equipment operating condition, pressures and temperatures 2.2 Recognise observations which differ from normal operating parameters and requirements 2.3 Take appropriate action to maintain correct operating parameters 2.4 Identify faults and initiate repair or report as required 2.5 Use measured/indicated data (eg, hour on line, pressure, temperature, flow, vibration) and smell, sight, sound and feel as appropriate to critically and frequently monitor all plant.

Element	Performance criteria
3. Prepare equipment for maintenance.	3.1 Isolate equipment identified for maintenance ensuring that equipment is drained, depressurised and made safe 3.2 Confirm equipment status by conducting appropriate gas sampling or testing and testing trips and alarms 3.3 Apply all stated requirements within the permit to work system to the maintenance activity 3.4 Bring equipment back to a stand by status prior to start up process commencing 3.5 Confirm equipment is ready to start up 3.6 Start up and bring the equipment on line as required.
4. Shut down and start up equipment.	4.1 Determine type of shutdown required 4.2 Check for related work or other affected plant to allow for coordination of activities and give advanced warning where possible 4.3 Check and satisfy all permit requirements before equipment is brought back on line 4.4 Monitor and report equipment performance to control operations 4.5 Complete logs recording the details of the work conducted to provide a historical record of the equipment's operation.
5. Control hazards.	5.1 Identify hazards in the production work area 5.2 Assess the risks arising from those hazards 5.3 Implement measures to control those risks in line with procedures and duty of care.
6. Respond to plant problems.	6.3 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 6.4 Recognise operational problems 6.5 Analyse cause of operational problems within scope of skill level 6.6 Take timely and appropriate action to solve operational problems.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. Some applications of this unit include:

- solvent dewaxer in a lube oil refinery
- spray or drum dryer
- fluidised bed dryer
- plant which is specialised, unique to an enterprise or otherwise uncommon.

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Typical problems for your plant may include:

- changes to rate
- product/material changes
- variations in conditions
- composition changes.

All operations are performed in accordance with procedures and relevant legislative or site specific safety requirements.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 and 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution
- pre-start checks are made to ensure equipment is lined up to the plant in accordance with procedures and/or manufacturers specifications.

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

Resource implications

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures

Essential knowledge

Competence in this unit must include knowledge of:

- all items on a schematic of the equipment and describe the function of each
- principles of equipment operation
- physics relating to the particular process
- chemistry relating to the process
- process equipment operating parameters
- process and product variables and reactions.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the production system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- variations in product parameters (temperature, flows, pressure and levels).

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMAOPS201A Operate fluid flow equipment

Unit descriptor

This competency covers the operation of the range of pumps and valves typically encountered in the fluid flow system of a processing plant. It includes identifying, operating, monitoring and troubleshooting these items.

In a typical scenario, an operator uses a number of general purpose pumps, piping and valves to move liquids from a storage tank area into the processing plant and products to the finished goods tanks. The operator utilises in-line strainers and filters, valves, controls and meters to complete this work.

The operator would:

- identify and report operational problems
- be aware of and contribute to a safe working environment
- contribute to the safe and productive operation of the equipment
- operate, monitor and maintain equipment using relevant procedures.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

This competency covers all general duty pumps, their associated drivers (motors) and valves. It does NOT cover special duty pumps, drivers and valves which are used for high pressure/flow situations (see PMA OPS 221, 222 and 223). Competence in this unit (OPS201) would preclude counting *PMAOPS223A Operate and monitor valve systems* towards a qualification.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Operate pumps.	1.1 Identify the type of pump 1.10 Start up and shut down pump according to the pump type and duty 1.11 Adjust flow and head/pressure as appropriate to type of pump 1.12 Start up from standby and after maintenance 1.13 Complete routine checks and reports taking action on unexpected readings and trends 1.14 Change over pumps as required.

Element	Performance criteria
2. Operate pump drivers.	2.1 Monitor critical variables such as amps, temperature and vibration 2.2 Keep critical variables in range 2.3 Recognise trends/patterns which indicate a potential or actual problem with the pump driver 2.4 Take action to ensure driver is returned to full performance in a timely manner.
3. Operate valves.	3.1 Identify the type of valve 3.2 Operate valve in a manner appropriate to the valve type 3.3 Complete routine checks and reports, taking action on unexpected readings and trends.
4. Respond to fluid flow problems.	4.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 4.2 Recognise operational problems 4.3 Analyse cause of operational problems within scope of skill level 4.4 Take timely and appropriate action to solve operational problems.
5. Carry out maintenance procedures.	5.1 Isolate and prepare fluid flow equipment for maintenance as required 5.2 Complete minor maintenance to procedures 5.3 Receive plant back from maintenance 5.4 Prepare plant for the introduction of fluids (eg, chemicals) 5.5 Return plant to operation.
6. Control hazards.	6.1 Identify hazards in fluid flow work area and equipment 6.2 Assess risks arising from those hazards 6.3 Take appropriate action to control risks to procedures and duty of care.

Range of variables

Context

This competency is typically performed by all operators. It includes items of equipment such as:

- pumps (including various types of centrifugal, positive displacement, acid egg, etc)
- valves (such as globe, needle, gate, butterfly, plug cock, wedge plug, ball cock, non-return, diaphragm, pneumatic globe, pneumatic butterfly)
- piping systems and components (including bends and elbows, tee pieces, expansion mechanisms, pipe joints, reducers, nipples, orifices, in-line filters and strainers, flexible hoses and couplings, etc)
- shaft seals (such as stuffing boxes, mechanical seals, fluid seals, labyrinth seals).

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The effect of pipe fittings on pump performance and problems/problem analysis is also included.

Typical problems include:

- cavitation
- seal leaks
- head loss/low flow
- bearing problems.

All operations are performed to procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 4 and 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment

activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS101A Make measurements
- PMAOPS102A Undertake housekeeping operations
- PMACOM100A Relay and respond to information.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

The assessment should cover at least one type of centrifugal pump and one type of positive displacement pump, as well as at least two different types of valves for the operator to be regarded as competent.

Essential knowledge

Competence includes an understanding of the fluid flow system and its integral equipment to a level needed to control the system, and recognise and resolve operational problems. In particular it includes a knowledge of:

- all items on a schematic of the fluid flow system and describe the function of each
- principles of operation of fluid flow equipment
- physics of operation
- correct methods of starting, stopping, operating and controlling flow
- causes of head loss in piping systems (including comparison of fittings using $\underline{L_e/d}$ concept, fluid and pipe material properties, flow geometry, etc)
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems (such as impellors, seals or bearings)
- types and causes of fluid flow problems within operator's scope of skill level and responsibility.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	1	1	1	2	1

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Unit title

PMAOPS202A Operate fluid mixing equipment

Unit descriptor

This competency covers the operation of the range of fluid mixers found in chemical and oil plants. Fluid mixing processes can vary from continuous mixing processes as typically found in oil plants to batch mixing as commonly used in chemical plants and paint manufacture. It covers the mixing of two or more materials to make a product.

In a typical scenario an operator uses a baffled mixing tank to make a product to specification. This covers the loading of liquid and perhaps solid materials into the mixing equipment. In this example the operator monitors the mixing to ensure the components are dispersed appropriately and checks the resulting product to ensure it complies.

This unit does NOT cover mixing which is part of the preparation of materials (see *PMAOPS105A Select and prepare materials*) nor the incidental mixing which occurs in a reaction vessel (see *PMAOPS220A Monitor chemical reactions in the process* or *PMAOPS302A Operate reactors and reactor systems*) or in-line mixers (see *PMAOPS201A Operate fluid flow equipment*).

The operator would:

- identify and report operational problems
- be aware of and contribute to a safe working environment
- contribute to the safe and productive operation of the equipment
- operate, monitor and maintain equipment using relevant procedures.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Prepare mixing equipment.	1.1 Identify type of fluid mixer 1.15 Identify appropriate applications for the mixer type 1.16 Check materials.
2. Operate fluid mixing equipment.	2.1 Charge materials 2.2 Start up/shut down fluid mixing equipment 2.3 Adjust mixing conditions through baffles, mixer speed or duration as required 2.4 Check product 2.5 Adjust product as instructed or to procedure 2.6 Discharge product 2.7 Complete routine checks and reports, taking action on unexpected readings and trends.

Element	Performance criteria
3. Respond to fluid mixing problems.	3.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 3.2 Recognise operational problems and inefficient mixing 3.3 Analyse cause of operational problems within scope of skill level 3.4 Take timely and appropriate action to solve operational problems.
4. Carry out maintenance procedures.	4.1 Isolate and prepare fluid mixing equipment for maintenance as required 4.2 Complete minor maintenance to procedures 4.3 Receive equipment back from maintenance 4.4 Prepare equipment for introduction of fluids (eg, chemicals) 4.5 Return equipment to operation.
5. Control hazards.	5.1 Identify hazards in work area 5.2 Assess risks arising from those hazards 5.3 Take appropriate action to control risks to procedures and duty of care.

Range of variables

Context

This competency is typically performed by all operators using mixing equipment.
It includes items of equipment such as:

- mixers for low, medium and high viscosity fluids
- jet mixing
- top and side entry mixers
- propeller, and pitched and square bladed turbine impellers.

Typical problems include incorrect:

- mixing time
- power consumption
- uniformity
- vortexing
- aeration.

Remedial actions include changing:

- position and angle of baffles where appropriate
- impellor (angle, size, shape or speed)
- feed rate of fluids.

All operations are performed to procedures.

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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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, parts of elements 3 and 4). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS101A Make measurements
- PMAOPS102A Undertake housekeeping operations
- PMACOM100A Relay and respond to information.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes an understanding of fluid mixing equipment and its integral equipment to a level needed to recognise and resolve operational problems. In particular it includes a knowledge of:

- all items on a schematic of the mixing system and describe the function of each
- fluid mixing principles, such as shear, viscosity and concepts of uniformity
- principles of operation of fluid mixing equipment
- physics of operation
- correct methods of starting, stopping, operating and controlling mixing equipment
- typical mixing problems, and their causes and remedy, within operator's scope of skill level and responsibility
- duty of care
- materials safety data sheets (MSDSs)
- HAZCHEM symbols and codes
- hazardous substances regulations
- spill containment and disposal procedures
- procedures related to this competency
- environmental requirements related to waste disposal
- workplace hazards and methods of controlling hazards.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	1	1	1	2	1

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Unit title

PMAOPS203A Handle goods

Unit descriptor

This competency covers the moving of goods into and out of a plant/chemical store. It applies to a limited range of goods only, such as might typically be handled by a processing plant store. In this competency, the operator would handle goods as part of their job role. The goods would typically be packaged, and tasks could include loading or unloading trucks, tanker trucks and semi-bulk containers.

The operator needs to:

- complete relevant paperwork
- confirm the goods are complete and undamaged
- take appropriate action with non-conforming goods and
- handle chemicals, dangerous goods and goods which have special requirements regarding handling and storage.

It is NOT intended for people whose major function is to operate a warehouse. Instead use relevant warehousing competency units from the Transport and Distribution Training Package. This competency is also NOT intended for those handling bulk goods in tank farms where *PMAOPS240 Store liquids in bulk* should be used. For operations involving bulk particulates, see *PMAOPS309 Operate particulates handling storage equipment*. This competency does NOT include the use of forklift trucks, which is instead covered by *TDTD1097B Operate a forklift.*

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Move goods into store.	1.1 Check paperwork and identity of goods 1.17 Check for completeness and damage 1.18 Take action on non-conforming goods/loads 1.19 Unload goods 1.20 Move goods to correct storage location 1.21 Store goods safely.
2. Move goods from store.	2.1 Interpret order/paperwork 2.2 Check and take action on special requirements (eg, dangerous goods) as required 2.3 Select items to be moved based on age of stock and other requirements 2.4 Move goods from store 2.5 Load goods to procedures.

Element	Performance criteria
3. Complete goods movement records.	3.1 Complete goods movement records (in or out) 3.2 Update stock records as required 3.3 Complete other paperwork and records as required.
4. Control hazards.	4.6 Identify hazards in work area 4.7 Assess risks arising from those hazards 4.8 Take appropriate action to control risks to procedures and duty of care.
5. Respond to goods handling problems.	5.1 Monitor goods movements as appropriate 5.2 Recognise problems and inefficient goods movements 5.3 Analyse cause of movement problems within scope of skill level 5.4 Take timely and appropriate action to solve movement problems.

Range of variables

Context

The terms ‘paperwork’ and ‘records’ mean any and all relevant information and data, whether manual, paper based, electronic or verbal, either relayed in person or by phone/radio/intranet, etc.

This competency does not imply that moving goods into store and from store are conducted equally, or even using similar techniques. Customers may be internal or external and loading/unloading goods may mean getting them onto/off a truck or simply from/to the next department.

Typical problems include:

- compatibility of goods in loads and in storage
- special storage requirements (eg, temperature control)
- special handling requirements (eg, fragile, dangerous goods)
- handling incomplete loads (either in or out)
- handling damaged goods, goods with poor/missing labels
- incomplete or incorrect paperwork.

All operations are performed to procedures.

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.

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Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, parts of elements 1 and 2 relating to non-conforming or dangerous goods). 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster. As well, competence must be demonstrated in safe handling/storage of goods, including dangerous or hazardous goods.

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

- all relevant safety requirements are followed, including manual handling and safe handling/storage of hazardous substances
- early warning signs of equipment/processes needing attention or with potential problems are recognised
- 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.

Resource implications

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.

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Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Also consider co-assessment with:

- PMAOPS102A Undertake housekeeping operations
- PMACOM100A Relay and respond to information
- TDTD10B Operate a forklift.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes an understanding of store processes to a level needed to recognise and resolve non-standard situations to procedures. In particular it includes a knowledge of:

- paperwork related to this competency
- manual handling techniques
- handling and storage requirements of hazardous substances
- hazardous substances regulations
- regulations related to transporting hazardous substances
- duty of care
- materials safety data sheets (MSDSs)
- HAZCHEM symbols and codes
- spill containment and disposal procedures
- procedures related to this competency
- environmental requirements related to waste disposal
- workplace hazards and methods of controlling hazards.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	1	1	2	1

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Unit title

PMAOPS204A Use utilities and services

Unit descriptor

This unit covers the use of a range of utilities and services in the plant. It includes the selection of the appropriate utility/service from those provided to the plant.

In a typical scenario an operator will be able to identify and select utilities and services used on a day to day basis. These will be provided to a process plant and will consist of instrument and plant air, nitrogen, plant water, steam, flushing oil and other utilities/ services required for a particular process. The operator uses these utilities/services as required. The correct use and application of these substances is essential to plant and operator safety and the continued performance of the process.

Generally the operations technician would be part of a team during startup and shutdown procedures and may be expected to be capable of performing all parts of this unit, but only for those utilities/services required by their plant. At all times they would be liaising and cooperating with other members of the team.

This unit does not cover the provision or generation of utilities or services which are covered by:

- PMAOPS224A Provide fluids for utilities and support OR
- UTPNEG162A Operate and monitor boiler steam/water cycle.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Select and use utilities and services.	1.1 Identify utilities and services available in the plant 1.22 Identify key properties, applications and limitations of each utility and service 1.23 Select appropriate utility/service for the required duty 1.24 Use selected utility/service to procedures.
2. Control hazards.	2.1 Identify hazards in utility and services work area. 2.2 Assess the risks arising from those hazards. 2.3 Implement control measures for risks in line with procedures and duty of care.
3. Respond to problems.	3.1 Monitor use of utility/service frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate. 3.2 Recognise operational problems 3.3 Analyse cause of operational problems within scope of skill level 3.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

This unit of competency includes all service utilities which form part of the utility system. For your plant this may include (select relevant items):

- steam — saturated, superheated
- air — process, instrument, breathable
- water — cooling, boiler feed, plant, waste
- inert atmosphere — nitrogen, carbon dioxide
- flushing oil.

Typical problems for your plant may include:

- non-supply of products and elements
- variation in product and element feed rates
- variations in temperature, pressure and flow
- blockages or leakage.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, element 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

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:

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- 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.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- identify all items on a schematic of the utilities system and describe the function of each
- differences in use and methods between each service and utility
- hazards in operation of services
- differences between grades/types of services (eg, grades of steam, air and nitrogen).

Competence also includes the ability to isolate the causes of problems to an item of equipment within the production system and to distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- variations in product parameters (temperature, flows, pressure and levels).

Key competencies

1 Collect, analyse and organise information	2 Communicate ideas and information	3 Plan and organise activities	4 Work with others and in teams	5 Use mathematical ideas and techniques	6 Solve problems	7 Use technology
1	1	1	1	1	1	1

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Unit title

PMAOPS205A Operate heat exchangers

Unit descriptor

This competency covers the skills needed to operate heat exchangers, including heat exchangers that form part of a heating, cooling or refrigeration system.

This competency does NOT cover superheaters or waste heat boilers, which are treated as part of steam generating equipment.

In this competency, an operator would typically start up and shut down heat exchangers in accordance with procedures, and make adjustments to flow rate, temperature and pressure, depending on the type of heat exchanger. In particular, the operator needs to understand the factors affecting efficient operation of a heat exchanger in order to make appropriate adjustments or recognise when maintenance is required.

An important aspect of this competency is solving heat exchanger problems. The operator therefore needs to have a good understanding of heat exchanger operation and typical problems, along with the ability to implement remedial actions, which could include:

- making adjustments
- carrying out minor maintenance
- identifying and reporting problems outside operator's scope of responsibility
- identifying and controlling hazards related to heat exchangers and their integral equipment (including pressure vessels).

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Operate heat exchangers.	1.1 Identify the type of heat exchanger 1.25 Start up and shut down heat exchanger according to the heat exchanger type and duty 1.26 Adjust flow rates, temperatures and pressure as appropriate to type of heat exchanger 1.27 Start up from standby and after maintenance 1.28 Complete routine checks, logs and paperwork, taking action on unexpected readings and trends.

Element	Performance criteria
2. Respond to heat exchanger problems.	2.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate. 2.2 Recognise operational problems 2.3 Analyse cause of operational problems within scope of skill level 2.4 Take timely and appropriate action to solve operational problems.
3. Carry out maintenance procedures.	3.1 Isolate heat exchanger and prepare for maintenance or vessel entry as required 3.2 Complete minor maintenance according to procedures 3.3 Receive plant back from maintenance 3.4 Prepare plant for the introduction of chemicals/ hydrocarbons and operation. 3.5 Return plant to operation.
4. Control hazards.	4.1 Identify hazards in work area and with equipment 4.2 Assess risks arising from those hazards 4.3 Take appropriate action to control risks in accordance with procedures and duty of care.

Range of variables

Context

This competency is typically performed by an operator. It includes all types of heat exchangers such as:

- plate
- U-tube
- spiral
- bayonet
- air cooled fin
- shell and tube (all variants of design)
- scraped surface
- vessel jackets/coils.

This competency does NOT cover superheaters or waste heat boilers, as these are treated as part of steam generating equipment.

Heat exchanger duties include:

- heating
- cooling
- cryogenic
- reboilers
- condensers
- gas dryers
- gas coolers
- refrigeration (evaporators/condensers).

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Typical problems include:

- avoiding damage to heat exchanger due to overheating and/or under/overpressurising
- minimising factors that affect heat exchanger efficiency (scale build-up, fouling, internal leakage, air lock, turbulence, corrosion)
- leakage or gasket problems
- recognising when maintenance is required.

All operations are performed in accordance with procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, parts of elements 2 and 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

- PMAOPS201A Operate fluid flow equipment
- PMAOPS204A Use utilities and services
- PMACOM200A Process and record information.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes a comprehensive understanding of heat exchanger principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of:

- all items on a schematic of the heat exchanger system and describe the function of each
- principles of operation of heat exchangers
- physics of operation
- correct methods of starting, operating and shutting down heat exchangers
- typical problems with heat exchangers and their remedy
- issues related to pressure vessels (regulations, requirements).

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	1	1	1	2	1

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Unit title

PMAOPS206A Operate separation equipment

Unit descriptor

This competency covers the skills needed to operate typical stand alone dual phase separation equipment as used in a chemical or oil/hydrocarbons processing plant.

It does NOT cover powered separation equipment (eg, centrifuge) or chemical separation equipment which are instead covered by:

- PMAOPS207A Operate powered separation equipment
- PMAOPS208A Operate chemical separation equipment.

In this competency, an operator would typically start up and shut down separation operations in accordance with procedures, and make adjustments to flow rate and pressure, depending on the type of separation equipment. In particular, the operator needs to understand the factors affecting efficient operation of the separation equipment in order to make appropriate adjustments or recognise when maintenance is required.

An important aspect of this competency is solving problems with separation processes. The operator therefore needs to have a good understanding of the process and typical problems, along with the ability to implement remedial actions, which could include:

- making adjustments
- carrying out minor maintenance
- identifying and reporting problems outside operator's scope of ability
- identifying and controlling hazards related to separation equipment.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Operate separation equipment.	1.1 Identify the type of separation equipment 1.29 Start up and shut down separation equipment according to the separation equipment type and duty 1.30 Adjust flow and pressure as appropriate to type of separation equipment 1.31 Start up from standby and after maintenance 1.32 Complete routine checks, logs and paperwork, taking action on unexpected readings and trends.

Element	Performance criteria
2. Solve separation equipment problems.	2.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 2.2 Recognise operational problems 2.3 Analyse cause of operational problems within scope of skill level 2.4 Take timely and appropriate action to solve operational problems.
3. Carry out maintenance procedures.	3.1 Isolate and prepare separation equipment for maintenance or vessel entry as required 3.2 Complete minor maintenance according to procedures 3.3 Receive plant back from maintenance 3.4 Prepare plant for the introduction of chemicals and operation 3.5 Return plant to operation.
4. Control hazards.	4.1 Identify hazards in work area and with equipment 4.2 Assess risks arising from those hazards 4.3 Take appropriate action to control risks in accordance with procedures and duty of care.

Range of variables

Context

This competency is typically performed by all operators. It includes all types of stand alone separation equipment for gaseous, liquid and solids separation where the separation process is physical and the separator is not powered or motor driven. Separation equipment covered by this competency includes:

- cyclones
- hydrocyclones
- scrubbers
- knockout drums
- demisters/drift eliminators
- filters (cartridge, basket, sand, etc).

Typical problems include:

- seal/gasket leaks
- pressure loss/low flow
- cartridge/filter change
- blockages/build-up/fouling
- erosion/wear.

All operations are performed in accordance with procedures.

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

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between performance criteria and HSE requirements, the HSE requirements take precedence.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, parts of elements 2 and 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

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Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

- PMAOPS201A Operate fluid flow equipment
- PMACOM200A Process and record information.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes a comprehensive understanding of separation equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of:

- all items on a schematic of the separator system and describe the function of each
- principles of operation of separation equipment
- physics of operation
- behaviour of solids, liquids and gases
- function and troubleshooting of major internal components and their problems (such as cartridges, baskets, supports, nozzles, grids)
- typical problems with separation equipment and their remedy.

Competence also includes the ability to distinguish between types and causes of separation problems as relevant to the practical operation of equipment at the job level.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	1	1	1	2	1

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Unit title

PMAOPS207A Operate powered separation equipment

Unit descriptor

This competency covers the skills needed to operate powered dual phase separation equipment including centrifuges, scraped filters, rotary vacuum filters and the like. This type of equipment is found in many process manufacturing plants.

It does NOT cover stand alone, non-powered dual phase separation equipment or chemical separation equipment, which are covered by the following competencies:

- PMAOPS206A Operate separation equipment
- PMAOPS208A Operate chemical separation equipment.

In this competency, an operator would typically start up and shut down separation equipment to procedures, and make adjustments to flow rate and pressure, depending on the type of separation equipment. In particular, the operator needs to understand the factors affecting efficient operation of the separation equipment in order to make appropriate adjustments or recognise when maintenance is required.

An important aspect of this competency is solving problems with separation processes and the equipment, including the driver powering the separation equipment (eg, electric motor). The operator therefore needs to have a good understanding of the equipment, the process and typical problems, along with the ability to implement remedial actions.

This requires the operator to monitor critical variables such as amps, temperature and vibration as well monitoring the output from the separation equipment. Remedial actions could include:

- making adjustments to the equipment (flow, pressure, etc)
- carrying out minor maintenance within operator's skill level
- identifying and reporting problems outside operator's scope of ability
- identifying and controlling hazards related to powered separation equipment and surrounding areas.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Operate powered separation equipment.	1.1 Identify the type of powered separation equipment 1.33 Start up and shut down separation equipment according to the separation equipment type and duty 1.34 Adjust flow and pressure as appropriate to type of separation equipment 1.35 Start up from standby and after maintenance 1.36 Complete routine checks, logs and paperwork, taking action on unexpected readings and trends.
2. Operate drivers of separation equipment.	2.1 Monitor critical variables such as amps, temperature, vibration 2.2 Keep critical variables in range 2.3 Recognise trends/patterns which indicate a potential or actual problem with the driver 2.4 Take appropriate action to ensure driver is returned to full performance in a timely manner.
3. Solve separation equipment problems.	3.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 3.2 Recognise operational problems 3.3 Analyse cause of operational problems within scope of skill level 3.4 Take timely and appropriate action to solve operational problems.
4. Carry out maintenance procedures.	4.1 Isolate separation equipment and prepare for maintenance or vessel entry as required 4.2 Complete minor maintenance according to procedures 4.3 Receive plant back from maintenance 4.4 Prepare plant for the introduction of chemicals/hydrocarbons and operation 4.5 Return plant to operation.
5. Control hazards.	5.1 Identify hazards in work area and with equipment 5.2 Assess risks arising from those hazards 5.3 Take appropriate action to control risks to procedures and duty of care.

Range of variables

Context

This competency is typically performed by all operators. Separation equipment covered by this competency includes all types of powered separation equipment for gaseous, liquid and solids separation duties, such as:

- centrifuges
- rotary dryers
- rotary vacuum filters.

This competency covers electric motor drivers, however, other types of drivers may be included.

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Typical problems include:

- seal/gasket leaks
- pressure loss/low flow
- blockages/build-up
- erosion/wear
- separator driver problems.

All operations are performed in accordance with procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, parts of elements 3 and 4). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable

situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

- PMAOPS201A Operate fluid flow equipment
- PMACOM200A Process and record information.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes a comprehensive understanding of separation equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of:

- all items on a schematic of the separator system and describe the function of each
- principles of operation of separation equipment
- physics of operation (including kinetic energy effects)
- behaviour of solids, liquids and gases
- function and troubleshooting of major internal components and their problems (such as internals, supports, nozzles, grids or scrapers)
- typical problems with separation equipment and their remedy
- typical problems with drivers of separation equipment and their remedy.

Competence also includes the ability to distinguish between types and causes of separation problems as relevant to the practical operation of equipment at the job level.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	1	1	1	2	1

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Unit title

PMAOPS208A Operate chemical separation equipment

Unit descriptor

This competency covers the skills needed to operate chemical separation equipment where the feed is essentially in a single phase. It covers the range of separation equipment which rely on a phase change or chemical process to enact the separation, including crystallisers, ion-exchange filters, absorbers and the like.

It does NOT cover stand alone, non-powered dual phase separation equipment or powered dual phase separation equipment (eg, centrifuge) which are instead covered by:

- PMAOPS206A Operate separation equipment
- PMAOPS207A Operate powered separation equipment.

In this competency, an operator would typically start up and shut down separation operations in accordance with procedures, and make adjustments to flow rate and pressure, depending on the type of separation equipment. In particular, the operator needs to understand the factors affecting efficient operation of the separation equipment in order to make appropriate adjustments or recognise when maintenance is required.

An important aspect of this competency is solving problems with separation processes and the equipment. The operator therefore needs to have a good understanding of the equipment, the process and typical problems, along with the ability to implement remedial actions. Remedial actions could include:

- making adjustments (flow, pressure etc)
- carrying out minor maintenance within operator's skill level
- identifying and reporting problems outside operator's scope of ability
- identifying and controlling hazards related to chemical separation equipment and surrounding areas.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Operate chemical separation equipment.	1.1 Identify the type of chemical separation equipment 1.37 Start up and shut down chemical separation equipment according to type and duty 1.38 Adjust flow and pressure as appropriate to type of separation equipment 1.39 Start up from standby and after maintenance 1.40 Complete routine checks, logs and paperwork, taking action on unexpected readings and trends.

Element	Performance criteria
2. Solve separation equipment problems.	2.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 2.2 Monitor the activity, reagents and separation efficiency of the equipment 2.3 Recognise operational problems 2.4 Analyse cause of operational problems within scope of skill level 2.5 Take timely and appropriate action to solve operational problems.
3. Carry out maintenance procedures.	3.1 Isolate separation equipment and prepare for maintenance or vessel entry as required 3.2 Complete minor maintenance according to procedures 3.3 Receive plant back from maintenance 3.4 Prepare plant for the introduction of chemicals and operation 3.5 Return plant to operation.
4. Control hazards.	4.1 Identify hazards in work area and with equipment 4.2 Assess risks arising from those hazards 4.3 Take appropriate action to control risks in accordance with procedures and duty of care.

Range of variables

Context

Separation equipment covered by this competency includes all types of chemical separation equipment for gaseous, liquid and solids separation duties, where the feed is essentially in a single phase and the separation relies on a change of the material or a chemical process to enact the separation, such as:

- crystallisers
- ion-exchange filters/columns
- precipitators
- absorbers/adsorbers.

Typical problems include:

- seal/gasket leaks
- pressure loss/low flow
- cartridge/filter change
- reagent/medium activity
- blockages/build-up
- contaminants.

All operations are performed in accordance with procedures.

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

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between performance criteria and HSE requirements, the HSE requirements take precedence.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, parts of elements 2 and 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

- PMAOPS201A Operate fluid flow equipment
- PMACOM200A Process and record information.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes a comprehensive understanding of separation equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of:

- all items on a schematic of the separator system and describe the function of each
- principles of operation of separation equipment
- physics of operation (including behaviour of solids, liquids and gases, effects of phase changes, effects of temperature and pressure)
- chemistry of operation (including simple chemical reactions, elements, compounds and mixtures)
- function and troubleshooting of major internal components and their problems (such as reagents, contaminants, supports, nozzles, grids, etc)
- typical problems with separation equipment and their remedy.

Competence also includes the ability to distinguish between types and causes of separation problems as relevant to the practical operation of equipment at the job level.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	1	1	1	2	1

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Unit title

PMAOPS210A Operate particulates handling equipment

Unit descriptor

This competency covers the skills needed to operate the range of equipment used to store and convey particulate solids. This competency is typically performed by many operators in a solids handling plant and is often a starting point for operators to learn the operation of the plant as a whole. It covers items of equipment such as mechanical conveyor systems (including feeders), pneumatic conveyor systems and storage equipment such as hoppers and silos.

In this competency the operator would control the conveyor systems transporting particulates into or out of storage containers (eg, silos). This means setting up, starting and stopping mechanical or pneumatic conveyor systems and their feeder systems (if any) to convey the materials from one point to another (eg, between storage units, from storage to packing area). During the process the operator would monitor the operations, and take appropriate action to keep particulates moving correctly. This could include removing blockages and preventing rat holing or bridging in hoppers/silos.

This also requires the operator to recognise indications of potential problems with the equipment and to take appropriate and timely remedial action. The operator would carry out minor maintenance according to procedures, or report maintenance requirements outside the operator's level of ability.

The operator would also manage the particulates storage facilities. This includes:

- transferring stock into, out of or between storage units
- making effective use of the available storage capacity
- monitoring the quality, quantity and location of stock
- supplying customers (internal or external) with the correct quality and quantity of stock
- identifying and controlling hazards related to particulates handling equipment and surrounding areas.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Operate mechanical conveyors and/or feeders.	1.1 Identify the type of conveyor/feeder 1.41 Start up and shut down conveyor/feeder according to the conveyor type and duty 1.42 Complete routine checks, logs and paperwork, taking action on unexpected observations, readings and trends.
2. Operate pneumatic/vacuum conveyor.	2.1 Identify the type of conveyor 2.2 Start up and shut down conveyor according to conveyor type and duty 2.3 Complete routine checks, logs and paperwork, taking action on unexpected observations, readings and trends.
3. Operate fan/blower if appropriate.	3.1 Identify type of fan/blower 3.2 Start up and shut down fan/blower according to its type and duty 3.3 Monitor critical variables such as amps, temperature or vibration and recognise trends/patterns which indicate a potential or actual problem with the fan/blower.
4. Transfer particulates.	4.1 Check source, destination and route of planned transfer 4.2 Check quality, quantity and location of stored particulates 4.3 Transfer particulates into, out of and between storage units as required 4.4 Supply customers with correct quality and quantity in a timely manner.
5. Carry out maintenance procedures.	5.1 Isolate particulates handling equipment and prepare for maintenance/vessel entry as required 5.2 Complete minor maintenance according to procedures 5.3 Receive plant back from maintenance 5.4 Prepare plant for the introduction of particulates 5.5 Return plant to operation.
6. Control hazards.	6.1 Identify hazards in work area and with equipment 6.2 Assess risks arising from those hazards 6.3 Take appropriate action to control risks in accordance with procedures and duty of care.
7. Respond to particulates handling problems.	7.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate. 7.2 Recognise operational problems 7.3 Analyse cause of operational problems within scope of skill level 7.4 Take timely and appropriate action to solve operational problems.

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Range of variables

Context

This competency unit includes items of equipment such as:

- mechanical conveyors/feeders (including belt, vibrating, screw, flight; and feeders such as screw, star, slide, volumetric and weight)
- pneumatic conveyors (including aspects such as dense phase, disperse phase, pressure and vacuum)
- storage (eg, silos and hoppers, purging hoppers)
- bulk tankers, transportable containers, intermediate storage.

Typical problems include:

- damage to particulates
- contamination of stored stock
- rat holing and bridging in silos
- routing issues, etc.

All operations are performed in accordance with procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, those parts of elements 1, 2 and 3 requiring recognition of potential problems, and element 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

- PMAOPS201A Operate fluid flow equipment
- PMACOM200A Process and record information.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes a comprehensive understanding of the equipment and typical problems to a level needed to control the operation, and recognise and resolve operational problems.

In particular it includes a knowledge of particulate properties such as:

- particle size and shape — reactivity, solubility, colour, health, safety
- angle of repose — storage and transport
- angle of slide — transport
- explosivity — static electricity
- dusts — hazards, good practice.

It also requires a knowledge of:

- all items on a schematic of the particulates handling system and describe the function of each
- principles of equipment operation
- physics of operation
- density and bulk density
- good operating practices
- methods of resolving problems
- HAZCHEM symbols and codes.

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Competence also includes the ability to distinguish between:

- Grades and specifications of materials
- types and causes of conveyor or storage problems to a level that allows problems to be isolated to an item of equipment.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	1	1	1	2	1

Unit title

PMAOPS211A Operate manufacturing extruders

Unit descriptor

This competency covers the skills needed to operate extruders which produce plastic granules/pellets from polymer resin and similar extrusions, eg, powder coating resin. It includes the operation of equipment ancillary to the extruder, including that used for adding masterbatch and other additives.

In this competency, the operator would operate an extruder and its associated equipment, such as the input and output feeder systems or cooling systems. This includes starting up and shutting down the system, building the extrusion rate up correctly after start up, and then monitoring the system to maintain the required output rate and quality. This requires the operator to have a good understanding of the effect of adjustments (eg, barrel temperature) on the extrusion process. The operator would make appropriate adjustments as required to ensure the product quality meets specifications, output meets schedule and to minimise potential problems with the process.

In this competency, the operator would:

- make changes to the extruder system such as change the production rate or change the specifications of the output product
- perform cleaning and minor maintenance on the extruder system in accordance with procedures
- identify and control hazards related to manufacturing extruders and surrounding areas.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Start up extruder systems.	1.1 Perform pre-start-up checks 1.43 Start up individual items of equipment, and the entire extrusion system 1.44 Start up system after maintenance 1.45 Build up extrusion rate steadily 1.46 Produce output at specified rate and quality within minimum time.

Element	Performance criteria
2. Monitor and control the extrusion process.	2.1 Complete routine checks, logs and paperwork 2.2 Inspect pellet/granule properties, and recognise and correct problems 2.3 Monitor stock levels of feeds and products and take action to maintain production schedule and quality 2.4 Adjust plant to achieve required output rate and quality with maximum plant efficiency.
3. Change production rates and/or product grade/specification.	3.1 Predict from rates and schedule when a transition will be required 3.2 Manage transitions smoothly and in a timely manner 3.3 Minimise scrap/off grade as a result of a transition.
4. Carry out maintenance procedures.	4.1 Isolate extrusion equipment and prepare for maintenance as required 4.2 Test safety trips and alarms 4.3 Complete minor maintenance according to procedures 4.4 Receive plant back from maintenance 4.5 Prepare plant for the introduction of polymer and additives 4.6 Return plant to operation.
5. Shut down extrusion systems.	5.1 Determine type of shut down required 5.2 Give advance warning of shut down where appropriate 5.3 Change over individual items of equipment 5.4 Shut down individual items of equipment and the entire extrusion system 5.5 Perform an emergency shut down when required 5.6 Reset trips and alarms after a shut down and leave plant in a condition ready to restart 5.7 Shut down for maintenance when required.
6. Clean extruder.	6.1 Identify cleaning requirements 6.2 Clean extrusion equipment to requirements according to procedures.
7. Control hazards.	7.1 Identify hazards in work area and with equipment 7.2 Assess risks arising from those hazards 7.3 Take appropriate action to control risks in accordance with procedures and duty of care.
8. Respond to extruder problems.	8.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate. 8.2 Recognise operational problems 8.3 Analyse cause of operational problems within scope of skill level 8.4 Take timely and appropriate action to solve operational problems.

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Range of variables

Context

This competency unit includes all items of equipment and unit operations which form part of the extrusion system. Typically this will include:

- additive (including masterbatch) systems
- granule/pellet cutting and cooling systems
- barrel/head heating and cooling systems.

It could also include other equipment as well as the extruder itself.

Typical problems include:

- knife/blade/cutter adjustment
- screen pack preparation and changes
- granule/pellet properties not to specification
- granule/pellet cooling systems, etc.

All operations are performed in accordance with procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 3 and 4). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Critical aspects

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.

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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.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

- PMAOPS210A Operate particulates processing equipment
- PMACOM200A Process and record information.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes a comprehensive understanding of extrusion equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of:

- all items on a schematic of the extruder and describe the function of each
- principles of operation of equipment
- physics of operation (including effects of temperature and pressure)
- properties of materials being extruded
- temperature and viscosity effects
- isolating a problem to an item of equipment
- methods of resolving problems.

This knowledge is required of all major items of equipment which comprise the extrusion system. Competence also includes the ability to distinguish between types and causes of problems as relevant to the practical operation of equipment at the job level.

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Key competencies

1 Collect, analyse and organise information	2 Communicate ideas and information	3 Plan and organise activities	4 Work with others and in teams	5 Use mathematical ideas and techniques	6 Solve problems	7 Use technology
2	1	1	2	1	2	1

Unit title

PMAOPS212A Use enterprise data system

Unit descriptor

In a typical scenario, an operator is required to use enterprise 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. Typical data systems may involve:

- safety support, hazard data, materials data
- production systems, schedules, batch control, operating instructions
- logistical control systems, ordering, stock control, production and storage.

This unit does NOT apply to the use of computer packages, spreadsheets or databases for the collection and presentation of data see *PMBCOMP201B Use computers in the workplace*.

The plant technician would:

- input data to the systems as required
- locate and access data as required for production support/problem solving
- use data to support business objectives.

Generally the plant technician would be part of a team and is 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.

Prerequisites

This unit has **no** prerequisites.

Element	Performance criteria
1. Use enterprise data system.	1.1 Log on to enterprise data system 1.2 Navigate the menus, modules and pages as required 1.3 Use the help system 1.4 Exit the system to procedures.
2. Store data in system.	2.1 Ensure correct data is available for entry 2.2 Open correct data entry screen 2.3 Transcribe data accurately into the system as required 2.4 Confirm data has been accurately entered 2.5 Store data.
3. Use routine data from system.	3.1 Access data as required 3.2 Output the data as required 3.3 Input, adjust or make other changes as required to update the data.
4. Use data to support non-routine requirements.	4.1 Describe data required to support non-routine issue 4.2 Access data system to find required data 4.3 Output data in appropriate format using enterprise data system 4.4 Interpret data to support workplace requirements.

Element	Performance criteria
5. Respond to problems with the data system.	5.1 Identify the range of faults that can occur during the operation 5.2 Determine and rectify fault causes using procedures 5.3 Maintain appropriate records of system operations to meet procedures 5.4 Identify non-routine problems and report to designated person.

Range of variables

Context

This unit of competency includes enterprise data systems. For your plant this may include systems which cover (select relevant items):

- safety, safety data and injury reporting
- orders, purchasing, stock levels and scheduling
- stock control, stores, warehousing and logistics
- materials hazards, labelling, materials identification, MSDSs (materials safety data sheets)
- 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 enterprise systems will usually be computerised, but may include data sheets, paper or hard copy records, manuals and instructions.

Examples of non-routine requirements include:

- changes in product dimensions
- process condition trends
- effluent stream composition

Typical problems, which may require access to data for your plant, may include:

- adjusting plant rates or production schedule to respond to changes
- responding to maintenance issues
- meeting customer requirements
- responding to variations to meet enterprise KPIs.

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.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be on an operating enterprise system. The unit will be assessed in as holistic a manner as is practical and may be integrated

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with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 4 and 5). Simulation should be based on the actual enterprise system 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

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:

- 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.

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.

Resource implications

Assessment will require access to an operating enterprise 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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It may also be appropriate to assess this unit concurrently with a relevant OPS unit.

Essential knowledge

Competence includes an understanding of the enterprise 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 of variables.

Competence also includes the ability to isolate the causes of problems to a component of the enterprise data system and to distinguish between causes of problems such as:

- incorrect or misleading data
- system software faults
- system equipment faults.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	1	1	2	1

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Unit title

PMAOPS213A Package product/material

Unit descriptor

This competency covers the operation of a packing line to package materials and products.

Typical packing lines included in this competency may dispense liquid products into drums or plastic containers, pack filled containers into cartons or stack filled containers onto pallets.

In this competency, the operator would use documentation to determine the packaging requirements, then select and prepare the required materials. Once all requirements are established, the operator would then set up the packing line and any ancillary equipment (eg, labeler, measuring equipment, palletiser, dispensing equipment).

After checking that the packing line is ready for operation (free of blockages, contamination, etc), the operator would start the line to procedures and monitor its operation during the packaging process. This would include checking that the packaged product complies with specifications and completing relevant documentation.

The operator would have an understanding of:

- typical packaging problems, such as the effects of static electricity on the packaging process (including potential hazards with flammable liquids)
- dangerous goods regulations, HAZCHEM (where appropriate)
- labeling requirements
- compatibility issues with packaging materials and their content
- the identification and control hazards related to packaging operations and surrounding areas.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Prepare equipment and materials for packaging.	1.1 Identify from documentation the type, quantity and quality of product to be packed 1.47 Identify the range of packaging materials and ancillaries and their specific functions 1.48 Insure packaging materials are available in accordance with documentation 1.49 Select and prepare packaging materials according to compatibility with content, to procedures 1.50 Check packaging materials for correct labels/safety information.
2. Set up line.	2.1 Select appropriate measuring equipment 2.2 Select and fit appropriate dispensing equipment 2.3 Check all parts of line for damage, contamination or blockage 2.4 Clean equipment as required 2.5 Set up line for required quantity of product and labels to procedures.
3. Package product.	3.1 Fill package 3.2 Check that packaged product complies with specifications 3.3 Report as required.
4. Control hazards.	4.1 Identify hazards in work area and with equipment 4.2 Assess risks arising from those hazards 4.3 Take appropriate action to control risks to procedures and duty of care.
5. Respond to packaging plant/process problems.	5.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate. 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

This competency is typically performed by operators. It includes all items of equipment and operations which form part of the packaging process. Typically this will include indicative functions such as:

- packaging
- labelling
- palletising
- storing
- verification of product type, quantity and quality
- calculation of actual packaged product against documentation.

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Packaged products include:

- liquids (such as paint, detergents, chemicals)
- solids (powders and pellets)
- gases (and liquified gases).

Packaging includes:

- tins, cans
- drums
- bags and sacks
- semi-bulk (such as bulker boxes and pallecons)
- gas cylinders or drums.

It could also include resources such as:

- labelling equipment
- packaging materials
- documentation
- lifting/transporting equipment.

All operations are performed to procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

- PMAOPS203A Handle goods.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes a comprehensive understanding of extrusion equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes a knowledge of:

- OHS and legislative requirements relating to safe manual handling/lifting,
- OHS and legislative requirements relating to dangerous goods
- HAZCHEM and labeling requirements
- materials safety data sheets (MSDSs)
- compatibility of packaging materials with content
- effect of temperature and pressure on properties of substances
- effects and hazards caused by static electricity (where relevant)
- methods of resolving problems.

Competence also includes the ability to distinguish between types and causes of problems as relevant to the practical operation of equipment at the job level.

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Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	X	1	1	2	1

Unit title

PMAOPS216A Operate local control system

Unit descriptor

In a typical scenario, an operator is operating a batch reactor or self-contained section of plant, which requires the use of a local control system. 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 an understanding of the process and all OHS requirements including emergency situations.

The unit does NOT apply to operating a control panel for an integrated plant, where the control is from a separate control room or control system, which is covered by *PMAOPS305A Operate process control systems*.

The plant technician would:

- be aware of and contribute to a safe working environment
- identify and report operational problems to their supervisor / control room operator
- execute all routine activities including process monitoring, start up, shut down and adjustments (in accordance with position description).

Generally the operator would operate independently in the plant. The operator would be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

- This unit **has no** prerequisites.

Element	Performance criteria
1. Interface with the control panel.	1.1 Monitor the process using the operator interfaces and keep appropriate personnel informed on developments 1.51 Select appropriate controller modes to ensure the effective control of the process 1.52 Undertake required set point/output changes to optimise plant and process requirements 1.53 Access historical data and information 1.54 Acknowledge messages and alarms.

Element	Performance criteria
2. Control the process using local control system.	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 potential faults 2.3 Interpret alarms and prioritise steps to ensure control of system is maintained 2.4 Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics 2.5 Make required set point/output changes to meet plant and process requirements 2.6 Record process variations/irregularities in accordance with procedures.
3. Facilitate planned and unplanned process start-ups and shutdowns	3.1 Respond to all alarms and take appropriate action 3.2 Maintain co-ordination with all outside services and operations in order to assist in the correct identification and reporting of faults 3.3 Conduct planned start-up and shutdown processes to procedures 3.4 Conduct unplanned start-up and shutdown processes to procedures 3.5 Communicate with all operational areas and personnel affected by unplanned events to ensure safety is maintained during the process 3.6 Implement all required and stated emergency responses and ensure the outcomes of these responses are communicated to all affected areas 3.7 Log all required information for further action to provide a historical record of all events.
4. Control hazards.	4.1 Identify hazards in the production/processing work area 4.2 Assess the risks arising from those hazards 4.3 Implement measures to control risks in line with procedures and duty of care.
5 Respond to problems	5.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate. 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

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Range of variables

Context

This unit of competency includes all such items of equipment and unit operations, which form part of the production/processing system. For your local control system this may include (select relevant items):

- programmable logic controllers (PLCs)
- hard wired control and alarm panels
- analogue control systems
- personal computers
- printers
- fire and gas detection/protection systems
- emergency shutdown systems
- communications systems.

Typical problems for your plant may include:

- variation/loss of feed
- unstable control of pressure, temperature level and flows
- control equipment failure
- process plant trips
- change in atmospheric conditions (rain, temperature, wind, lightning)
- emergency situations.

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.

All work to be undertaken within the limits of the issued permit to work — this may include both hot and cold work requirements and may be within a team or individual context.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 3 and 5). Simulation should be based on the actual process control system and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems.

This unit of competency requires a significant body of knowledge, which will be assessed through questioning and the use of what if scenarios both on the plant (during

demonstration of normal operations and walk throughs of abnormal operations) and off the plant

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responses. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with appropriate operations competencies for the unit of plant.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures

Essential 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 describe 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, PID, PFS, cause and effect)

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- instrumentation and control systems
- effective communication techniques.

Competence also includes the ability to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies
- product parameters (temperature, flows, pressure and levels).

An ability to communicate with other work groups and personnel during the operation and monitoring of this equipment is considered to be an essential element of this unit of competency.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS217A Operate wet milling equipment

Unit descriptor

In a typical scenario an operator monitors and operates wet milling equipment as found in plants manufacturing paint and other materials. This includes starting up and monitoring the performance of the equipment under supervision, and in an emergency shutting down the equipment if instructed to do so.

The wet milling equipment may be vertical or horizontal mills, and may incorporate rolls, balls or beads as the milling medium.

The operator would:

- be aware of and contribute to a safe working environment
- identify and report operational problems to their supervisor/control room operator
- contribute to plant optimisation
- execute all routine activities including process monitoring, sampling, planning and maintenance (in accordance with position description).

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Start up mill.	1.1 Perform pre-start-up checks 1.55 Liaise with other team members and control room operator on the intended function 1.56 Confirm raw materials are available and correct 1.57 Prepare pre-mixer and introduce raw materials to pre-mixer (if required) 1.58 Start up the mill normally and after maintenance 1.59 Build operating rate steadily, checking expected performance criteria at various stages 1.60 Bring to specified conditions within specified time.
2. Monitor milling operation.	2.1 Monitor and observe mill operating condition, pressures and temperatures 2.2 Recognise observations which differ from normal operating parameters and requirements 2.3 Take appropriate action to maintain correct operating parameters 2.4 Identify faults and initiate repair or report as required 2.5 Monitor life of beads (if applicable) and/or condition of rollers/balls (if applicable).

Element	Performance criteria
3. Prepare milling equipment for maintenance.	3.1 Isolate milling equipment identified for maintenance ensuring that equipment is drained, depressurised and made safe 3.2 Ensure milling equipment is safe to work on, by conducting appropriate gas sampling or testing and testing trips and alarms 3.3 Apply all stated requirements from the permit to work system to the maintenance activity 3.4 Bring milling equipment back to a stand-by status prior to start up process commencing 3.5 Confirm that the milling equipment ready to start up 3.6 Start up and bring equipment on line as required.
4. Shut down and start up milling equipment.	4.1 Determine type of shutdown required 4.2 Check for related work or other affected plant to allow for coordination of activities and give advance warning where possible 4.3 Check and satisfy all permit requirements before equipment is brought back on line 4.4 Monitor and report equipment performance to control operations 4.5 Complete logs recording the details of the work conducted to provide a historical record of the equipment's operation.
5. Control hazards.	5.1 Identify hazards in the production work area 5.2 Asses 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 wet milling problems.	6.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 6.2 Recognise operational problems 6.3 Analyse cause of operational problems within scope of skill level 6.4 Take timely and appropriate action to solve operational problems.

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Range of variables

Context

This unit of competency includes various types of wet milling equipment (select the types relevant to your plant):

- vertical
- horizontal
- bead mills
- roll/ball-type mills.

This unit also covers ancillary equipment which form part of the wet milling system. For your plant this may include (select relevant items):

- pre-mix vessels
- coolers, cooling jackets and heat exchangers
- pumps
- vessels, tanks
- piping systems
- valves and flanges
- sumps and drains.

Typical problems for your plant may include:

- condition and life of beads (if applicable)
- condition of rollers/balls (if applicable)
- cooling system fouling
- blocked filters or piping
- high/low levels
- loss of process cooling resulting in high process temperatures
- equipment failure or shutdown resulting in loss of feed to process
- excess/unexpected sand production
- composition changes

All operations are performed in accordance with procedures and relevant legislative or site specific safety requirements.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, element 6). 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution
- pre-start checks are made to ensure equipment is lined up to the plant in accordance with procedures and/or manufacturers specifications

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

Resource implications

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Competence includes an understanding of demonstration of competence in this unit must include knowledge of:

- all items on a schematic of the mill system and describe the function of each
- principles of milling equipment operation
- physics relating to the particular process
- process equipment operating parameters
- process and product variables
- bead life (if beads are used in process).

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Competence also includes the ability to distinguish between causes of problems/alarms/fault indications such as:

- equipment malfunction (including consequences and potential for escalation)
- plant not performing to design
- bead life, roller/ball wear or adjustment (as applicable).

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS220A Monitor chemical reactions in the process

Unit descriptor

This unit covers an operator looking after a production process which includes a chemical reaction. The vessel in which this reaction is occurring may be a purpose built 'kettle' or other reaction vessel, or it may simply be a stirred tank in which a reaction is occurring. Processes may be batch or continuous.

The reaction is NOT just incidental to the operation (eg, where the reaction is simply dissolution or dissociation where *PMA OPS 202 Operate fluid mixing equipment* would be appropriate).

The reaction, which itself may be simple, is a key step in the process, and the operator needs to monitor and control this reaction in order to produce the desired product. The reaction may, or may not, include the use of catalyst (either homogeneous or heterogeneous phase). The reactor or reaction vessel includes types of vessels such as:

- kettles
- stirred tanks.

The operator would:

- identify and rectify operational problems
- monitor the reactor operation, making adjustments as directed or to procedure
- adjust product properties as directed or to procedure.

This reactor and its control would be relatively simple, operated in a stand alone manner and typically might be found in a small batch plant, although appropriate examples might also exist in larger plants. For more complex reactions/reactors see *PMA OPS 302 Operate reactors and reaction equipment.* It is expected that the operator would usually be liaising and cooperating with other members of the shift.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Prepare reactor.	1.1 Perform preliminary checks 1.61 Charge materials to procedures 1.62 Bring the reactor contents to the specified conditions steadily and within specified time frame.
2. Monitor and control the reaction process.	2.1 Monitor process and make required adjustments to achieve specified output 2.2 Adjust product as instructed or to procedures 2.3 Discharge vessel as required 2.4 Clean vessel and prepare for next batch/product 2.5 Complete required reports.

Element	Performance criteria
3. Carry out maintenance procedures.	3.1 Test trips and alarms as required 3.2 Complete minor maintenance to procedures 3.3 Shut down for maintenance when required 3.4 Prepare plant for maintenance/vessel entry as required 3.5 Receive plant back from maintenance 3.6 Reset trips and alarms after a shut down 3.7 Prepare plant for the introduction of chemicals and operation 3.8 Leave plant in a condition ready to restart.
4. Control hazards.	4.1 Identify hazards in reaction work area 4.2 Assess the risks arising from those hazards 4.3 Implement measures to control those risks to procedures and duty of care.
5. Respond to plant problems.	5.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate. 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

This competency unit includes all minor items of equipment which are integral to the reaction process.

Typical problems include:

- variations in material composition
- variation in ambient conditions
- control of reaction temperature
- adjustments to meet product specifications.

All operations are performed in accordance with procedures.

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.

Operators should be able to determine safe working practice using the relevant materials safety data sheets.

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Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 4, 5 and 6). 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It will frequently also be appropriate to assess this unit concurrently with:

- PMAOPS101A Read dials and indicators
- PMAOPS102A Undertake housekeeping operations

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- PMAOPS105A Select and prepare materials
- PMAOPS202A Operate fluid mixing equipment
- PMAOPS203A Handle goods
- PMAOPS205A Operate heat exchangers
- PMAOPS212A Use enterprise data system
- PMAOPS213A Package product/material
- PMAOPS216A Operate local control system.

Essential knowledge

Competence includes an understanding of the reactions and equipment integral to the operation of the reactor to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the reactor and describe the function of each
- distinguish between elements, compounds and mixtures in raw materials and products
- describe the nature/condition of materials at each stage of the reaction, the changes which have occurred in that stage and why they have occurred
- describe reactions in chemical terms, including the effect of changing reaction variables (eg, temperature, concentration, pH)
- state the type of reactor(s) used and their characteristics
- describe the methods of controlling the reaction (including rate and yield)
- describe the causes and remedies of common problems such as those selected in the range of variables.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the reaction system and to distinguish between causes of problems/alarm/fault indications such as:

- raw materials variations
- instrument failure/wrong reading
- equipment failure (electrical/mechanical)
- mechanical failure
- operational problems.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
1	1	1	1	1	1	1

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Unit title

PMAOPS221A Operate and monitor prime movers

Unit descriptor

In a typical scenario a prime mover and its ancillary equipment is used to drive a high pressure pump or compressor. The prime mover may be a large high voltage/current electrical motor, a turbine or a diesel engine. It is a complex, independent item of equipment with a specialised start up and shut down procedure. It may have its own control panel and inbuilt vibration monitoring equipment. Often the operation of a prime mover will require a 'ticket' (special licence) to operate. Check local requirements. This unit includes starting up/shutting down and monitoring the performance of the equipment and a full understanding of OHS requirements including emergency situations.

The operations technician would:

- identify and report operational problems
- be aware of and contribute to a safe working environment
- contribute to the safe and productive operation of the prime mover
- monitor, shut down and start up prime mover and ancillary equipment using relevant procedures.

This unit does not apply to close coupled motors which are operated as part of the equipment (eg, for pump motors see *PMAOPS201A Operate fluid flow equipment*).

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Prepare equipment for operation.	1.1 Check operation and function of prime movers by applying principles of operation and procedures 1.63 Check the operational area to ensure that any potential hazards which may affect the operation of the equipment are removed 1.64 Conduct required safety checks and pre-starts to determine or verify the operational condition of the equipment.
2. Start up prime movers.	2.1 Commission prime mover protection devices prior to the start-up of equipment 2.2 Achieve operational flows and temperatures of ancillary equipment before bringing the system on line for use 2.3 Start up prime mover according to procedures.

Element	Performance criteria
3. Monitor and assess prime mover systems.	3.1 Monitor and correct fuel and energy systems and flows to ensure that the system provides the proper operational mixture for prime mover use 3.2 Ensure adequate supplies of clean air at the stated rate or temperature are delivered to the prime mover to allow for successful operation to be achieved 3.3 Monitor lubrication systems to verify that operational parts are functioning efficiently and effectively, and to ensure that all moving parts are operating in a friction free and clean environment 3.4 Monitor and adjust cooling systems to allow for the most efficient operating temperature to be maintained throughout all operating conditions 3.5 Monitor governing systems to allow correct operational speeds of equipment to be maintained and regulated.
4. Conduct operational maintenance.	4.1 Conduct routine inspections and checks to ensure normal or stated prime mover operation is maintained 4.2 Identify equipment faults through observation of the operational equipment and periodic sampling and testing 4.3 Determine action and communicate maintenance requirements to appropriate personnel 4.4 Record operational data to provide a historical record of the operating condition of equipment.
5. Prepare equipment for maintenance.	5.1 Shut down prime mover to procedure 5.2 Isolate equipment identified for maintenance, ensuring that equipment is drained, depressured, purged, flushed and made safe to work on, to procedures 5.3 Perform appropriate gas sampling or testing as required 5.4 Ensure all stated preparation requirements within the permit to work system have been carried out to safely perform the maintenance activity.
6. Control hazards.	6.1 Identify hazards in the production/processing work area 6.2 Assess the risks arising from those hazards 6.3 Implement measures to control those risks in line with procedures and duty of care.
7. Respond to prime mover problems.	7.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 7.2 Recognise operational problems 7.3 Analyse cause of operational problems within scope of skill level 7.4 Take timely and appropriate action to solve operational problems.

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Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. For your plant this may include (select relevant items):

- diesel, gas and petrol reciprocating engines
- turbine engines
- electric motors
- governing systems
- power supply
- safety and shutdown systems
- cooling systems.

Typical problems for your plant may include:

- variation in power/fuel supply
- vibration
- overheating
- fouling of turbine/engine/exchangers
- lubrication quality
- ancillary equipment failures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1, 2 and 4). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the prime movers and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

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Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

As a general rule assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential Knowledge

The knowledge referred to in the evidence guide for this unit includes:

- identify all items on a schematic of the prime mover and describe the function of each
- prime mover operating parameters and capacities
- prime mover operating principles including fuel injection, lubrication, cooling, ignition, induction and exhaust power supply
- equipment operation including flows, pressures temperatures and speeds
- equipment terminology
- sampling and testing techniques
- process drawings (eg, PID, PFS. cause and effect)
- safety systems and procedures
- job hazard analysis.

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Competence also includes the ability to distinguish between causes of problems/alarms/fault indications such as:

- prime mover failure or malfunction
- electrical failure or malfunction
- mechanical failure/malfunction
- equipment design deficiencies
- quality measurement inaccuracy eg, (analyzer, manual sampling deficiencies)
- fuel quality
- fouling or contamination (eg, turbines /exchangers/lubrication etc)

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS222A Operate and monitor pumping systems and equipment

Unit descriptor

In a typical scenario a prime mover is used to drive a complete pumping system including pumps and ancillary equipment (eg, vibration monitors, lubrication pumps and equipment, gear boxes and barring gear). This unit includes starting up/shutting down the system and monitoring the performance of the equipment including responding to the requirements of emergency situations.

The operations technician would:

- identify and report operational problems
- be aware of and contribute to a safe working environment
- contribute to the safe and productive operation of the pump
- monitor, shut down and start up pump and ancillary equipment using relevant procedures.

This unit only applies to pumping systems and equipment which are driven by prime movers and does not include systems with close coupled motors (see *PMAOPS201 Operate fluid flow equipment).*

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites, however it does have a corequisite of:

- PMAOPS221A Operate and monitor prime movers.

Element	Performance criteria
1. Prepare equipment for operation.	1.1 Check operation and function of pump and driver by applying principles of operation and procedures 1.65 Check the operational area to ensure that any potential hazards which may affect the operation of the equipment are removed 1.66 Conduct pre-start-up checks on the driver and pump to ensure that all nominated operational valves are correctly sequenced before commencing pumping operations, and that all safety requirements are met.
2. Start up pump.	2.1 Commission pump protection devices prior to the start-up of equipment 2.2 Achieve operational flows and temperatures of ancillary equipment before bringing the system on line for use 2.3 Startup prime mover to procedures.

Element	Performance criteria
3. Monitor and assess pumping systems and equipment.	3.1 Verify the operational condition of all flanges, gaskets and seals to ensure that the operational integrity of these components is maintained within stated operational tolerances and to avoid any environmental damage 3.2 Monitor pumping installations/equipment to determine if the correct pump pressures, temperatures and flows conform to their required application 3.3 Monitor and regularly check pumping systems/ equipment performance and all components to identify any signs of excessive wear and diminution of performance 3.4 Check operational valves and valve assemblies for possible leakages 3.5 Monitor and identify variations in the operating conditions of the pumping systems/equipment through the interpretation of amperage operating data and equipment 3.6 Periodically check and clean filter systems to remove any potential blockages or impurities entering the pumping system/equipment and causing it to cavitate or malfunction during operation 3.7 Inspect and sample lubrication oil to check that operating levels are correct and to determine if any contamination has taken place which may affect the operational capacity of the pumping system/equipment.
4. Conduct operational maintenance.	4.1 Conduct routine inspections and checks to ensure normal or stated pump operation is maintained 4.2 Identify equipment faults through observation of the operational equipment and periodic sampling and testing 4.3 Determine action and communicate maintenance requirements to appropriate personnel 4.4 Record operational data to provide a historical record of the operating condition of equipment.
5. Prepare equipment for maintenance.	5.1 Isolate equipment identified for maintenance ensuring that equipment is drained, depressured, purged, flushed and made safe to work on, according to the relevant procedures 5.2 Perform appropriate gas sampling or testing as required 5.3 Ensure all stated preparation requirements within the permit to work system have been carried out to safely perform the maintenance activity.

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Element	Performance criteria
6. Control hazards.	6.1 Identify hazards in the production/processing work area 6.2 Assess the risks arising from those hazards 6.3 Implement measures to control those risks in line with procedures and duty of care.
7. Respond to pump problems.	7.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate. 7.2 Recognise operational problems 7.3 Analyse cause of operational problems within scope of skill level 7.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the pumping system. For your plant this may include (select relevant items):

- beam pumps
- electrical submersible pumps
- jet pumps
- centrifugal pumps
- positive displacement pumps eg, reciprocating pumps
- various drivers (diesel engine, electric motor, steam turbine, etc)
- instrumentation
- filters.

Typical problems for your plant may include:

- variation in feed
- vibration
- control of level, temperature, pressure and flow
- blockages
- overheating
- overloading.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1, 2 and 4). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of pumps and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

As a general rule assessment will require access to an operating an operating pump system over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

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Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- identify all items on a schematic of the pump system and describe the function of each
- pumping system/equipment operating parameters
- sampling and testing techniques
- equipment terminology
- plant or field layout or geography
- safety systems and procedures
- fault finding and troubleshooting techniques
- job hazard analysis.

Competence also includes the ability to and be able to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure malfunction
- electrical failure malfunction
- mechanical failure malfunction
- equipment design deficiencies
- product parameters (temperature, viscosity, purity).
- fouling or contamination eg, (filters, exchangers, seal system, lubrication etc)
- cavitation
- overheating (bearings, casing etc).
- overload

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS223A Operate and monitor valve systems

Unit descriptor

In a typical scenario an operator adjusts and monitors valves and ancillary equipment as part of controlling a process (eg, hydrocarbons transport pipeline, gas distribution network). This unit may be required when *PMAOPS222A Operate and monitor pumping systems and equipment* is appropriate. It may only be counted towards a qualification where competence in *PMAOPS201A Operate fluid flow equipment* is unable to be obtained due to the nature of the job, but the operation of valves is relevant.

The operations technician would:

- identify and report operational problems
- be aware of and contribute to a safe working environment
- contribute to the safe and productive operation of the valve
- operate, monitor and maintain equipment using relevant procedures

Generally the operator would be part of a team and would be expected to be competent in all parts of this unit. At all times they would be liaising and cooperating with other members of the team/shift.

Prerequisites

This unit **does not** have prerequisites:

Element	Performance criteria
1. Prepare valves for operation.	1.1 Check operation of valves and valve systems by applying knowledge of valve operation and fundamental operating principles 1.67 Check the valves required for operation against the site specific operating pressures, temperatures, volume, velocities and materials requirements where applicable 1.68 Prepare or sequence valves required for operation, ensuring that they are either closed or opened as required, to regulate the flow of liquids and systems flow rates in a safe and efficient manner 1.69 Check the valve's operational integrity to minimise the risk of valve leakages and failures.
2. Operate valve systems.	2.1 Monitor valve operation to ensure it is functioning correctly and excludes such incidents as vibration, chatter, cycling, and sticking 2.2 Regulate or alter valve sequences to control the flow rates of fluid during the process to meet changing production conditions and demands.

Element	Performance criteria
3. Conduct operational maintenance.	3.1 Clean and lubricate valve stems, threads and other operational parts to ensure the correct operational condition of the valve is maintained 3.2 Evenly tighten valve bolting assembles to prevent product leakage 3.3 Identify valve and regulator faults and take appropriate action 3.4 Isolate jammed or sticking valves from operation, report and prepare for maintenance.
4. Control hazards.	4.1 Identify hazards in 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 valve problems.	5.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the valve system. For your plant this may include (select relevant items):

- globe, butterfly, ball and gate valves
- control valves
- isolation valves
- non-return or check valves
- pressure relief valves
- shutdown systems
- hydraulic power units.

Valve actuation may be:

- pneumatic
- hydraulic
- electrical
- manual.

Typical problems for your plant may include:

- vibration/resonance
- blockages/hydrates
- valve seat wear
- valve seal leakage
- valve stem leakage

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- mechanical failure, eg, plug/gate
- valve sticking.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, element 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of valve systems and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

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Resource implications

As a general rule assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It will feequently also be appropriate to assess this unit concurrently with:

- PMAOPS221A Operate and monitor pumping systems and equipment

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- identify all items on a schematic of the valve system and describe the function of each
- physics related to the process
- valve equipment operating parameters
- process and product variables and reactions
- operating pressures
- operating temperatures
- flow volume calculations
- flow velocity calculations
- fluid corrosive properties
- fluid erosive properties.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the valve system and distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies (eg, wrong valve type for service)
- product parameters (eg, temperature, viscosity, purity)
- fouling or contamination
- erosion and corrosion.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMAOPS224A Provide fluids for utilities and support

Unit descriptor

This unit covers the generation, provision or 'making' of services for use by a plant. While this generally would apply to a remote or off shore plant, it may also be appropriate for other plants.

In a typical scenario an operator uses and monitors a range of equipment which provides essential fluids for process support. These fluids may be used for instrumentation, cooling, stabilising, scrubbing and hazard reduction, fire suppression and other uses.

The operator would:

- identify and report operational problems
- be aware of and contribute to a safe working environment
- contribute to the safe production of utility and support fluids
- operate, monitor and maintain equipment following relevant procedures.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit for the services relevant to their plant. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

This unit does not cover the generation of steam using a fired boiler — see

- UTPNEG162A Operate and monitor boiler steam/water cycle

nor the use of these services as part of operating a process plant — see

- PMAOPS204A Use utilities and services

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Start up equipment and/or processes.	1.1 Ensure equipment or process is ready to start and not tagged out or subject to work order 1.70 Check all valves, inlets and outlets are in correct positions for start-up 1.71 Check as appropriate for 'clear board' with all indicators 'in the green' 1.72 Inform other plant personnel as appropriate 1.73 Commence start-up to procedures and monitor fluid flows, temperatures and/or pressures 1.74 Confirm all fluids are flowing at correct volume, pressure and/or temperature.

Element	Performance criteria
2. Monitor utility and support fluid equipment.	2.1 Determine the required levels of demand for support or utility fluids from a knowledge of the plant/site's process control systems or equipment 2.2 Monitor process equipment and systems, including compressors, pumps, receivers and distribution systems, to meet and maintain the facility's utility's service requirements 2.3 Monitor and manually adjust flow or ensure correct operation of automatic control valves to control the flow of fluids into the plant/site's process systems and equipment 2.4 Monitor quality of fluids and ensure that they remain within specifications, eg, quality and consistency 2.5 Complete routine checks and reports taking action on unexpected readings and trends.
3. Prepare for maintenance.	3.1 Monitor service records to assist with programmed maintenance scheduling 3.2 Monitor equipment for evidence of maintenance needs outside programmed maintenance 3.3 Advise other site personnel of the need to take equipment off-line for maintenance action 3.4 Identify back-up or auxiliary equipment (where provided) to facilitate maintenance of fluid supplies within the facility 3.5 Ensure equipment can be safely taken off line for maintenance 3.6 Isolate equipment and prepare for maintenance as required 3.7 Complete minor maintenance to procedures 3.8 Receive plant back from maintenance 3.9 Prepare plant for the introduction of fluids 3.10 Return plant to operation.
4. Respond to emergencies.	4.1 Identify critical out of specification performance of equipment and contact appropriate personnel 4.2 Respond to an emergent situation according to procedures 4.3 Shut down, under instruction, any equipment and associated equipment affected by the emergency situation 4.4 Implement any back-up procedures to ensure the ongoing supply of critical fluids to the remainder of the facility 4.5 Ensure all safety procedures are fully complied with.

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Element	Performance criteria
5. Respond to problems.	5.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate. 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.
6. Control hazards.	6.1 Identify hazards in work area and equipment 6.2 Assess risks arising from those hazards 6.3 Take appropriate action to control risks to procedures and duty of care.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the utilities/fluids supply system. For your plant this may include (select relevant items):

- plant water equipment
- high and low pressure steam equipment
- flushing oil systems
- cryogenic plants
- refrigerant systems
- filtration equipment
- purge systems.

Typical problems for your plant may include:

- variation in fluid feed
- vibration or surging
- control of level, temperature, pressure and flow
- blockages or leakage.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1, 3, 4 and 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

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Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- identify all items on a schematic of the system and describe the function of each
- principles of equipment operation
- physics relating to the particular process
- chemistry relating to the process
- process equipment operating parameters
- emergency back up systems
- process control systems and instrumentation
- the differences between high pressure and low pressure systems.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the production system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- product parameters (temperature, flows, pressure and levels).

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS230A Monitor, operate, and maintain pipeline stations and equipment

Unit descriptor

In a typical scenario, an operator is responsible for the operation and monitoring of pipeline stations and associated equipment within the parameters established. The competence includes examining the station and its equipment for signs of damage and/or need of maintenance, maintaining general cleanliness and reporting against specific requirements. Pipeline stations can include:

- maintenance bases
- compressor stations
- scraper stations
- inlet and delivery stations
- mainline block valve sites.

The operator would:

- identify and rectify operational problems
- monitor station operating parameters
- maintain station equipment.

Generally the operator would work on an individual basis and be expected to be capable of performing all parts of this unit, but may be part of a team. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel, however, it can be applied to a pipeline control centre if applicable.

AS 2885 Part 3 forms the principle reference standard for this competency.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Plan and organise for activities.	1.1 Review previous reports and check for outstanding work orders or notices 1.75 Obtain tools, equipment and testing devices needed to carry out the work and check for correct operation and safety 1.76 Check operational area to ensure that any potential hazards which may affect operation of the equipment is controlled or removed 1.77 Conduct required safety checks and pre-start checks to determine or verify the operational condition and parameters of the equipment 1.78 Seek status of the system through communication with pipeline control centre personnel prior to commencing start-up.

Element	Performance criteria
2. Start up and monitor the system.	2.1 Start up the system to procedures 2.2 Monitor and adjust systems to allow for the most efficient operation to procedures 2.3 Identify equipment faults through inspection and testing of the operational equipment 2.4 Monitor operating conditions of equipment through condition monitoring systems, gauge levels, temperatures and flow indicators in order to determine performance of equipment and system 2.5 Apply fault finding and troubleshooting techniques to operational systems/equipment to identify any repairs or maintenance needing to be undertaken 2.6 Monitor and convey information concerning the operation of the pipeline system to relevant personnel to ensure safe and efficient operation of the pipeline system 2.7 Select and apply emergency response in accordance with procedures to control the situation and prevent further risk of personal injury, or of product, equipment or environmental damage 2.8 Complete reports to procedures.
3. Shut down system/equipment.	3.1 Complete shutdown to procedures and conditions 3.2 Apply emergency shutdown procedures in the event of serious equipment failure or operational parameters being exceeded 3.3 Maintain records/reports to procedures.
4. Plan and prepare for minor maintenance.	4.1 Select and use all necessary and appropriate facilities, tools, test and measurement instruments, materials and components to allow the completion of the work 4.2 Make safe the facilities/equipment by ensuring it is safely isolated, depressurised, tagged and locked out and a permit to work is obtained as appropriate before allowing any repair or maintenance work to be undertaken 4.3 Identify equipment faults through inspection and testing of the operational equipment to procedures 4.4 Apply fault finding and troubleshooting techniques to operational systems/equipment in order to identify any repairs or maintenance which may need to be undertaken.

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Element	Performance criteria
5. Perform routine maintenance.	5.1 Adjust, calibrate and test equipment and devices to ensure they operate within specified ranges and maintain correct flow parameters to ensure product availability 5.2 Select and interpret all necessary and appropriate plans, drawings and text in order to carry out servicing of equipment 5.3 Isolate work area to enable repair to proceed to procedures 5.4 Perform maintenance in accordance with acceptable standards of cleanliness and with a minimum of waste and rework.
6. Record and report results.	6.1 Document and record maintenance results to procedures 6.2 Notify work completion to procedures 6.3 Cancel where appropriate permit to work and sign off at completion of repair.
7. Control hazards.	7.1 Identify hazards in pipeline station 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.
8. Respond to plant problems.	8.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 8.2 Recognise operational problems 8.3 Analyse cause of operational problems within scope of skill level 8.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

This unit of competency includes all items of equipment and unit operations which form part of the pipeline system. For your plant this may include (select relevant items):

- compressor systems and equipment including monitoring systems, anti surge systems, safety systems and compressor control systems
- prime movers including turbine engines, reciprocating engines and electric motors,
- instrument and control systems
- valve systems.

Typical problems for your plant may include:

- gas/product leaks
- incorrect valve positions
- electrical problems
- compressor or pump failure
- out of current inspection status

- gauge failure or hose rupture, leaks
- instruments out of calibration
- instruments and equipment requiring cleaning.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 4 and 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the pipeline and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

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incidents on similar plants around the world, hazard analysis activities and similar sources.

Resource implications

As a general rule assessment will require access to an operating pipeline system over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMASUP236A Operate vehicles in the field
- PMAOPS221A Operate and monitor prime movers
- PMAOPS304A Operate and monitor compressors
- PMAOPS223A Operate and monitor valve systems.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- operating principles of heaters, furnaces and exchangers
- station instrumentation
- condition monitoring equipment
- station power supplies
- operations of metering equipment
- functions of process control equipment
- principles behind gas analysis equipment
- purpose of valves, actuators and flanges
- layout of piping systems
- sumps and drains
- station pressure vessels/filtration equipment.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the pipeline system and to distinguish between causes of problems/alarm/fault indications such as:

- process gas variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problems.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	1	1	1	2	2

Unit title

PMAOPS231A Control gas odourisation

Unit descriptor

In a typical scenario, an operator in a gas odourising facility monitors the daily inventory of the odourising agent in the storage vessel. The operator also:

- checks and maintains the odourising rate of the injection pumps
- facilitates bulk transfers to maintain working levels
- initiates scheduled duty and standby cycles for the injection equipment.

The operator is familiar with the physical and chemical properties of the product and understands all the safety issues set down in the materials safety data sheet (MSDSs), associated with this chemical.

The operator would:

- identify and rectify operational problems
- respond to emergency situations

Generally the operator would be part of a team during startup and shutdown procedures and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has** the prerequisite of:

- PMAENV200A Monitor and control environmental hazards.

Element	Performance criteria
1. Prepare to odourise gas.	1.1 Check operational equipment to ensure it still complies with manufacturer's specification 1.79 Apply odourant injection start up procedure 1.80 Maintain records.
2. Control odourisation in accordance with legislative requirements.	2.1 Maintain the odour of the gas 2.2 Store odourant 2.3 Handle or transport odourant 2.4 Handle waste products in accordance with legislative requirements 2.5 Complete reports and logs.
3. Shut down odourisation operations.	3.1 Apply emergency procedures in the event of serious equipment failure or operational parameters being exceeded 3.2 Apply shutdown procedure in accordance with operating conditions 3.3 Maintain records/reports.
4. Control hazards.	4.1 Identify hazards in odorisation facility 4.2 Assess the risk arising from these hazards 4.3 Implement risk control measures in line with procedures and duty of care.

Element	Performance criteria
5. Respond to plant problems.	5.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

This unit of competency includes all items of equipment and unit operations which form part of the gas odorisation system. For your plant this may include:

- emergency response kit including absorption material
- neutralising agents
- storage level indicator (magnetic detector)
- personal protective equipment
- molecular sieve for venting
- pumps and flow control equipment.

Typical problems for your plant may include:

- suction vapour locks
- diaphragm ruptures
- low suction pressure
- flow regulator failures
- gas leaks and fires
- equipment failures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 to 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality

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interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the gas odourisation plant and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

As a general rule assessment will require access to an operating gas odourisation system over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- identify all items on a schematic of the gas odourisation equipment and describe the function of each
- gas odorisation systems and their component functions
- nature/condition of materials entering and leaving each stage of the process
- changes which have occurred in each stage and why they have occurred
- causes and remedies of common problems such as those selected in the range of variables

- physics involved in the process.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the gas odourisation system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- process gas variations
- instrument failure/wrong readings
- electrical failures
- mechanical failures
- operational problems.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	1	1	2	2

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Unit title

PMAOPS232A Produce product by filtration

Unit descriptor

In a typical scenario, a product is filtered to remove a particulate solid (precipitate/cake) from the liquid (filtrate). The filtrate or the precipitate may be the product. The operations technician will monitor pressure differentials through filtration equipment and may check temperature gradients, product flows and levels in order to confirm the correct working status of all the equipment under control. Filter vessels and internals vary depending on process requirements.

The operations technician would:

- identify and correct operational problems
- determine the impact of differential pressure changes and adjust process variables accordingly
- liaise with maintenance to schedule equipment availability.

Generally the operations technician would be part of a team during startup and shutdown procedures and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1 Start up/shut down the filter system.	1.1 Select the appropriate filtration units or the appropriate number of units to ensure product specifications are met 1.2 Check the condition of all process equipment before startup 1.3 Make filtration equipment or systems ready and bring components and entire system on line 1.81 Isolate filtration equipment for element change-out/clean out and maintenance as appropriate 1.82 Shut down individual components and whole system as required.
2. Monitor the filtration process.	2.1 Monitor process systems to ensure that product specifications are met 2.2 Monitor and keep filtration equipment within requirements 2.3 Liaise with appropriate people as required 2.4 Adjust filter process to meet requirements.

Element	Performance criteria
3. Record process variations.	3.1 Record product variations, noting the type of variation and actions undertaken to rectify the deviation as a reference for further action and investigation 3.2 Arrange required maintenance of operational equipment and communicate to appropriate personnel.
4. Control hazards.	4.1 Identify hazards in filtration area 4.2 Assess the risks arising from these hazards 4.3 Implement measures to control those risks in line with procedures and duty of care.
5. Respond to filtration problems.	5.1 Monitor plant frequently and critically throughout shift using measured/indicated data and senses (sight, hearing, etc) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the filtration system. For your plant this may include (select relevant items):

- plate and frame filters
- leaf filters
- cartridge filters
- bed (sand/gravel) filters
- disk/edge filters
- membranes
- differential pressure monitoring equipment.

Typical problems for your plant may include:

- control pressure
- effects on upstream and downstream plant
- clogging.

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.

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Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 to 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of filtration and integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

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Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS201A Operate fluid flow equipment.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- identify all items on a schematic of the filter system and describe the function of each
- principles of the filtration process
- filter cake properties where appropriate
- systems operating parameters.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the filtration system and to distinguish between causes of problems/alarm/fault indications such as:

- process variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMAOPS240A Store liquids in bulk

Unit descriptor

In a typical scenario the plant technician will manage a series of liquid storage tanks for raw materials and finished product as part of the production process. The plant technician will arrange for the unloading of tanker trucks, transfer of liquids from the storage tanks to processing area, finished product to the appropriate tanks and also loading of tankers with finished product.

The plant technician will be able to:

- identify the material and interpret any special handling or storage requirements (including dangerous or hazardous goods requirements) from the available information
- ensure that the destination for the liquid is appropriately prepared, has enough capacity and is correctly piped
- check that the liquids are being stored safely in tanks and that safety equipment and services are monitored
- respond to emergency situations.

This unit does not apply to the transfer and storage of bulk materials typically found within refinery storage areas or hydrocarbons processing areas. For these areas refer to *PMAOPS307A Transfer of product into land or sea based storage facility.*

Generally the plant technician would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Prepare storage/loading facilities.	1.1 Ensure that products are being stored in the tank area to procedures 1.83 Inspect storage facilities for leaks or damage 1.84 Check and test safety equipment and systems to verify their operational condition and status, and report all equipment faults 1.85 Confirm quantities and specifications of stored liquids in the tank area 1.86 Identify and report all equipment requiring maintenance, follow up to satisfactory conclusion.

Element	Performance criteria
2. Transfer liquids to and from tanks.	2.1 Confirm tank mixes, capacities and quality, and determine if these are being maintained within the agreed product requirements prior to transfer 2.2 Ensure all areas involved in the transfer are safe to allow transfer of liquids to occur 2.3 Inspect all transfer equipment (including lines, hoses, pumps, fittings, instruments and controls) before transfer and report any problems 2.4 Confirm that transfer destination has sufficient capacity for the transfer 2.5 Transfer liquids safely to procedures 2.6 Conduct cleaning, purging or draining as required 2.7 Record transfer as required.
3. Control hazards.	3.1 Identify hazards on platform or in terminal storage and operations 3.2 Assess the risks arising from these hazards 3.3 Implement measures to control those risks to procedures and duty of care.
4. Respond to problems.	4.1 Identify possible problems in equipment and process 4.2 Determine problems needing action 4.3 Determine possible fault causes 4.4 Rectify problem using appropriate solution within area of responsibility 4.5 Follow up items until resolved 4.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations, which form part of the storage and loading system. For your facility this may include (select relevant items):

- tanks
- vessels
- pumps
- compressors
- road or rail tanker loading facilities
- gauges
- fire protection and deluge systems
- inert gas blanketing or purging systems (eg, nitrogen)
- gas detection systems and equipment
- tank dipping and measurement equipment.

Product may include any liquid chemical or product used in the plant and stored in bulk.

Typical problems for your facility may include:

- interruptions to loading through adverse weather conditions

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- selection of appropriate storage facility
- control of temperature and pressure
- variations in feed
- vibration
- tank capacities and space.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 3 and 4). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

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Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS201A Operate fluid flow equipment.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Demonstration of competence in this unit must include knowledge of the following:

- identify all items on a schematic of the tank farm and describe the function of each
- testing techniques
- equipment isolation and purging
- use and operation of safety equipment (including breathing apparatus if required)
- tank and product mixes
- flow rates and measures
- tank capacities and percentages
- static electricity principles.

Sound knowledge of storage and transfer techniques required for transport of oil, gas or water is expected.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMAOPS290A Operate a biotreater

Unit descriptor

In a typical scenario, a plant produces an aqueous waste stream which has a high BOD/is contaminated with organic material. This waste stream is treated using a biotreater to produce a clean, low BOD effluent which is acceptable for discharge either to the sewer (as trade waste) or to a receiving waterway where it is within the environmental regulations. This unit includes the operation of all associated pumps, dosing pumps, agitation, aeration and similar equipment which is integral to the operation of the biotreater. This unit applies to any waste treatment facility using microorganisms to clean an aqueous stream. It includes biotreaters which use aerobic, anaerobic and/or facultative microorganisms

This unit does NOT apply to other waste treatment equipment (such as filtration or chemical dosing) which would be covered by the relevant OPS unit. The significant factor with this unit is not that it is treating waste, but that it is using microorganisms to perform the treatment at ambient temperatures. For temperature controlled microorganism based processes see *PMA OPS 390A Operate a biochemical process*

The plant technician would:

- identify and rectify operational problems
- predict the potential impact of feed changes
- facilitate feed changes

This unit does NOT require the operation of a central control panel.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Monitor and control the biotreater processes.	1.1 Get information relevant to the operation of the biotreater 1.87 Identify changes in key variables such as: • feed rate • feed composition • feed concentration • rapid changes in feed characteristic 1.88 Keep feed as consistent as possible 1.89 Check performance of ancillaries such as agitation 1.90 Recognise and interpret trends in biotreater data/appearance 1.91 Recognise the signs of potential and actual problems 1.92 Identify the consequences to the biotreater processes of the identified changes, trends and problems 1.93 Take action to minimise the impact on safety, health, the environment and the business of potential and actual problems.

Element	Performance criteria
2. Ramp performance up/down.	2.1 Anticipate significant changes in feed 2.2 Breed up/down biomass to prepare for change in feed by changing variables such as: • nutrient dosing • aeration rate (if appropriate) • agitation rate 2.3 Ramp changed feed at a rate suitable for the biotreater 2.4 Establish stable operation for new feed conditions.
3. Maintain effectiveness of biotreater system.	3.1 Frequently and critically monitor biotreater system throughout shift 3.2 Use measured/indicated data and smell, sight, sound and feel as appropriate 3.3 Identify critical equipment and processes 3.4 Identify issues likely to impact on the whole plant performance and take appropriate action 3.5 Predict impact of a change in the biotreater system on other plant units/areas and communicate this to relevant people 3.6 Predict impact of a change in the processing plant on the biotreater and take appropriate action 3.7 Test trips and alarms as required in liaison with the panel operator.
4. Manage impact of shutdowns on biotreater system.	4.1 Identify type of shutdown required 4.2 Identify impact of type of shutdown on biotreater 4.3 Liaise with appropriate people for shutdown 4.4 Arrange to maintain adequate feed to biotreater for a short plant shutdown 4.5 Arrange to preserve adequate seed stock of microorganisms for long plant shutdown or shutdown of biotreater 4.6 Shut down individual items of equipment and the entire biotreater system if required 4.7 Prepare biotreater system for maintenance/vessel entry as required 4.8 Receive plant back from maintenance 4.9 Reset trips and alarms after a shut down 4.10 Prepare biotreater for operation 4.11 Ramp biotreater back to normal operation.
5. Control hazards.	5.1 Identify hazards in biotreater work area 5.2 Assess the risks arising from those hazards 5.3 Implement measures to control those risks in line with procedures and duty of care.

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Element	Performance criteria
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.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the biotreater system. For your plant this may include (select relevant items):

- pumps (feed and dosing pumps)
- utilities and services such as air
- agitators
- air/gas supply/removal
- other equipment integral to the operation of the biotreater system.

Typical problems for your plant may include:

- sudden changes in feed (rate, composition, concentration)
- handling a plant shutdown without allowing the microorganisms to die
- control of degree of agitation
- settling/removal/recycling of biosolids.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 2, 3, 4 and 6). 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.

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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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Competence includes an understanding of the biotreater system and its integral equipment to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the biotreater system and describe the function of each
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- state the biochemical changes which are occurring in each stage and the methods of controlling them
- describe the causes and remedies of common problems such as those selected in the range of variables

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- describe methods of ramping up/down in response to feed changes 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 biotreater system and distinguish between causes of problems/alarm/fault indications such as:

- feed variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	2	1	1	2	2

Unit title

PMASMELT260A Form carbon anodes

Unit descriptor

This competency applies to plant technicians who are required to operate the carbon anode forming process in the production of carbon anodes used in the aluminium smelting process. This competency unit typically covers items of equipment, such as:

- carbon paste preparation, heating, mixing and delivery
- carbon anode forming equipment
- carbon anode cooling system
- ancillary equipment, such as heating systems, scrubbers and fans
- conveyors, power and free

The plant technician would:

- monitor the carbon anode forming process
- operate materials handling equipment
- recognise and respond to 'out of parameter' issues
- respond to emergency situations
- identify and control hazards in the workplace.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel

Prerequisites

This unit **has no** prerequisites

Element	Performance criteria
1. Plan and prepare for operations.	1.1 Interpret and confirm work requirements before proceeding 1.2 Ensure appropriate authorisations have been obtained/issued 1.3 Identify work flow path (interruptions or bottlenecks) blockage.
2. Conduct pre-start requirements to procedures.	2.1 Conduct routine pre-start equipment checks 2.2 Conduct isolation as appropriate for pre-start inspections 2.3 Prepare equipment for operation 2.4 Complete routine equipment checklists 2.5 Complete reports as required for equipment inspections.

Element	Performance criteria
3. Conduct operations to procedures.	3.1 Start up carbon anode forming equipment 3.2 Monitor equipment operation and check operational variables are within parameters. 3.3 Verify equipment performance throughout the process 3.4 Apply operating principles to resolve identified problems and adjust operational variations using trouble- shooting techniques 3.5 Shut down carbon anode forming equipment as required 3.6 Conduct routine housekeeping activities 3.7 Complete records as required for equipment operation and performance.
4. Control hazards.	4.1 Identify hazards in the production 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 plant problems.	5.1 Monitor plant frequently and critically throughout shift, using measured/indicated data and senses (sight, hearing etc.) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

Procedures include all company, enterprise, site or section procedures, work instructions or policies, equipment or manufacturer's manuals, procedures or guidelines which maybe written or electronically communicated.

Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.

Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment

Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.

Emergency responses include those related to: evacuation due to fire, loss of power, excessive emissions of fumes or particulate, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress.

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Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.

Hazards may include:

- Heat (burns, dehydration and heat stress)
- Energy sources eg hydraulic, pneumatic and electric
- High pressure piping and valves
- Pinch and crush points
- Moisture
- Banned items
- Mobile equipment and pedestrian interaction
- Suspended loads and roller conveyors
- Hazardous materials (eg heat transfer fluid (HTF), tar and pitch, coal tar pitch volatiles (CTPV)).

Out of parameter issues, faults and problems may include:

- Out of parameter operation or product
- Fluctuation in temperature, power consumption or product movement.
- Vibe plate distribution and cleaning
- Inspections on the compaction station
- Blocked strainers on the anode cooling system
- Paste belt irregularities
- Anode cooling system not operating properly.
- Jam-ups on power & free conveyors
- Instruments and equipment requiring cleaning
- Equipment mechanical and electrical problems
- Flow path blockages
- Out of parameter emissions
- Unavailability of equipment, personnel or material.

Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.

Instrument/electrical systems may include:

- Emergency shutdown systems
- Fire systems
- Pressure and temperature control systems
- Communications systems
- Utility systems.

Monitoring systems in the carbon anode forming process may include

- Monitoring bearing lubrication
- Monitor pre-heat distribution of the anode
- Monitor moisture content of the anode
- Monitor strainers on the anode cooling system
- Monitor the cooling tower
- Monitor anode forming
- Mobile equipment condition
- Checks on pitch pump, paste mixer and cleaning discharge for irregularities
- Monitor paste build-up on scale doors, cover weight and mould seals

- Vacuum Former failure
- Monitor abnormal trends in the operation of equipment or product specification
- Screens, samplers, grates, grids, fume scrubbers, weight feeders, and dust collection systems

Equipment and tools may include:

- Hand tools
- Harnesses and slings
- Materials handling equipment.

Reports and records may include:

- Routine inspections (daily readings, monthly checks)
- Scheduled maintenance activities
- Computer readouts locally or in the control room
- Shift log sheet
- Mandatory or statutory inspections
- Hazard, accident and incident reports
- Quality inspection reports of the product.

Start up procedure will conform to site procedure and include:

- Safety and Pre-start checks
- Accessing shift logs and equipment records
- Pre-shift briefing information
- Records and reports from the previous shift.

Monitor and adjust operational variations using troubleshooting techniques may refer to the use of historical data, records, common faults, access troubleshooting lists and directives, site procedure.

Shut down procedure must follow equipment and site authorised checklist and may include communication to supply and delivery areas, communication to impacting areas, obtaining appropriate authorisations, rescheduling operations and liaison with maintenance teams.

Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.

HSE

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures eg. spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

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Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this competency unit (eg, elements 2, 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

Critical aspects

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

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

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

- Emergency responses are known.
- Hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- Early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the carbon anode forming process including equipment, material handling systems and mobile equipment.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.

This competency may be assessed in conjunction with:

- PMAOHS200A Participate in workplace OHS procedures
- PMAOHS110A Respond to emergency situation.
- TDTD1097B Operate a forklift
- PMCSUP270A Move materials
- Other units which are relevant to the job.

Essential knowledge

Competence includes a comprehensive understanding of the green carbon process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes knowledge of:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements (eg. CTPV)
- all items on a schematic of the paste preparation and carbon anode forming process and describe the function of each
- basic principles of operation of main equipment items including: proportioning, dry mix preheating, mixing/heating, carbon anode forming and carbon anode cooling
- basic physics of operation, including effects of temperature, pressure and impurities on the green carbon anode quality
- basic understanding of the product specifications and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

Competence includes the responding to emergency situations such as, evacuation due to fire, loss of power and excessive emissions of fumes or particulate, equipment failure and recognising hazards associated with HTF, tar, pitch, suspended loads and heat stress.

Troubleshooting a range of problems which could include paste mixers, anode formers, anode cooling, equipment cooling, conveyors or equipment failure.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMASMELT261A Bake carbon anodes

Unit descriptor

This competency applies to plant technicians who are required to operate the carbon bake processes in the production of carbon anodes used in the aluminium smelting process. This competency unit typically covers items of equipment, such as:

- carbon anode furnace
- ancillary equipment, such as scrubbers and fans
- conveyors
- cranes (may require PMA SUP 237 Undertake crane, dogging and load transfer operations)
- mobile equipment, such as scissor lifts, forklifts and front-end loaders (may require other competencies eg. TDTD 1097 B Operate a forklift for licensed load shifting or PMCSUP270 Move materials for unlicensed load shifting).

The plant technician would:

- monitor the carbon bake process
- prepare and conduct fire change
- change thermocouples
- monitor furnace refractory condition
- inspect scrubbers
- operate materials handling equipment
- recognise and respond to 'out of parameter' issues
- respond to emergency situations
- identify and control hazards in the workplace.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel

Prerequisites

This unit **has no** prerequisites:

Element	Performance criteria
1. Plan and prepare for operations.	1.1 Interpret and confirm work requirements before proceeding
	1.2 Ensure appropriate authorisations have been obtained/issued
	1.3 Identify work flow path (interruptions or bottlenecks) blockage.
2. Conduct pre-start requirements to procedures.	2.1 Conduct routine pre-start equipment checks
	2.2 Conduct isolation as appropriate for pre-start inspections
	2.3 Prepare equipment for operation
	2.4 Complete routine equipment checklists
	2.5 Complete reports as required for equipment inspections.
3. Conduct carbon bake operations to procedures.	3.1 Start up anode bake and ancillary equipment
	3.2 Monitor equipment operation and check operational variables are within parameters.
	3.3 Verify equipment performance throughout the process
	3.4 Apply operating principles to resolve identified problems and adjust operational variations using trouble- shooting techniques
	3.5 Shut down anode bake and ancillary equipment as required
	3.6 Conduct routine housekeeping activities
	3.7 Complete records as required for equipment operation and performance.
4. Control hazards.	4.1 Identify hazards in the production 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 plant problems.	5.1 Monitor plant frequently and critically throughout shift, using measured/indicated data and senses (sight, hearing etc.) as appropriate
	5.2 Recognise operational problems
	5.3 Analyse cause of operational problems within scope of skill level
	5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

Procedures include all company, enterprise, site or section procedures, work instructions or policies, equipment or manufacturer's manuals, procedures or guidelines which maybe written or electronically communicated.

Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.

Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment

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Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.

Emergency responses include those related to:

- Rain and water in electrical ducts, explosions due to loss of draft, evacuation due to fire, loss of power and excessive emissions of fumes or particulate, equipment failure and heat stress. leaks/loss of containment, equipment failure
- Hazards and incidents, site safety procedures
- Flow path blockages
- Authorisations and communication processes for normal and emergency situations must follow site procedure

Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.

Hazards may include:

- Open furnace pits, ring main risers, fire shaft pit, riser shaft, natural gas
- Heat (burns, dehydration and heat stress)
- Energy sources eg hydraulic, pneumatic and electric
- High pressure piping and valves
- Pinch and crush points
- Moisture
- Banned items
- Mobile equipment and pedestrian interaction
- Furnace emissions
- Suspended loads and roller conveyors
- Hazardous materials (eg reactive alumina, kaowool, tar and pitch)
- Molten materials.

Out of parameter issues, faults and problems may include:

- Temperature and oxygen fluctuations
- Production line speed variations
- Variation of product specification on the input and output side
- Electrical problems
- Instruments and equipment requiring cleaning
- Equipment mechanical problems
- Flow path blockages
- Out of parameter emissions
- Unavailability of equipment, personnel or material.

Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.

Instrument/electrical systems may include:

- Emergency shutdown systems
- Fire systems
- Pressure and temperature control systems
- Communications systems
- Utility systems.

Equipment and tools may include:

- Hand tools
- Harnesses and slings
- Materials handling equipment

Reports and records may include:

- Routine inspections (daily readings, monthly checks)
- Scheduled maintenance activities
- Computer readouts locally or in the control room
- Shift log sheet
- Mandatory or statutory inspections
- Hazard, accident and incident reports
- Quality inspection reports of the product.

Start up procedure will conform to site procedure and include:

- Safety and Pre-start checks
- Accessing shift logs and equipment records
- Pre-shift briefing information
- Records and reports from the previous shift.

Monitor and adjust operational variations using troubleshooting techniques may refer to the use of historical data, records, common faults, access troubleshooting lists and directives, site procedure.

Shut down procedure must follow equipment and site authorised checklist and may include communication to supply and delivery areas, communication to impacting areas, obtaining appropriate authorisations, rescheduling operations and liaison with maintenance teams.

Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.

HSE

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures eg. spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this competency unit (eg, elements 2, 5). Simulation should be based on the actual plant and will include

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walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

Critical aspects

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

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

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

- Emergency responses are known.
- Hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- Early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the carbon anode baking process including equipment, material handling systems and mobile equipment.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.

This competency may be assessed in conjunction with:

- PMAOHS200A Participate in workplace OHS procedures
- PMAOHS110A Respond to emergency situation.
- PMASUP237A Undertake crane, dogging and load transfer operations
- TDTD1097B Operate a forklift
- PMCSUP270A Move materials
- Other units which are relevant to the job.

Essential knowledge

Competence includes a comprehensive understanding of the carbon bake process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes knowledge of:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements
- all items on a schematic of the carbon bake process and describe the function of each

- basic principles of operation of main equipment items including: scrubbers; port plates; thermocouples and burner tips
- basic physics of operation, including effects of temperature, conveyor speed and time on anode quality
- basic understanding of the product specifications and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

Competence includes the responding to emergency situations such as: open furnace pits, ring main risers, fire shaft pit, riser shaft, natural gas usage, rain and water in electrical ducts, explosions due to loss of draft, evacuation due to fire, loss of power and excessive emissions of fumes or particulate, equipment failure and recognising hazards associated with reactive alumina, tar, pitch, kaowool, suspended loads and heat stress.

Troubleshooting a range of problems which could include anode baking equipment, anode stacker cranes, conveyors, rotators, burner tips, port plates, or equipment failure.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMASMELT262A Clean and strip anode rods

Unit descriptor

This competency applies to plant technicians who operate equipment to clean and strip the spent carbon anodes from the anode rods used in the aluminium smelting process. This competency unit typically covers items of equipment, such as:

- carbon anode cleaning equipment (bath removal)
- carbon anode stripping equipment (including presses)
- rod stripping equipment (removal of iron thimbles)
- rod cleaning equipment (including shot blasting)
- rod reject process
- conveyors, power and free
- cranes (may require PMA SUP 237 Undertake crane, dogging and load transfer operations)

The plant technician would:

- operate the anode stripping and rod cleaning equipment
- operate materials handling equipment
- recognise and respond to 'out of parameter' issues
- respond to emergency situations
- identify and control hazards in the workplace.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel

Prerequisites

This unit **has no** prerequisites

Element	Performance criteria
1. Plan and prepare for operations.	1.1 Interpret and confirm work requirements before proceeding
	1.2 Ensure appropriate authorisations have been obtained/issued
	1.3 Identify work flow path (interruptions or bottlenecks) blockage.
2. Conduct pre-start requirements to procedures.	2.1 Conduct routine pre-start equipment checks
	2.2 Conduct isolation as appropriate for pre-start inspections
	2.3 Prepare equipment for operation
	2.4 Complete routine equipment checklists
	2.5 Complete reports as required for equipment inspections.

Element	Performance criteria
3. Conduct anode rod stripping and cleaning operations to procedures.	3.1 Start up anode stripping equipment 3.2 Monitor equipment operation and check operational variables are within parameters. 3.3 Verify equipment performance throughout the process 3.4 Apply operating principles to resolve identified problems and adjust operational variations using trouble- shooting techniques 3.5 Shut down anode stripping equipment as required 3.6 Conduct routine housekeeping activities 3.7 Complete records as required for equipment operation and performance.
4. Control hazards.	4.1 Identify hazards in the production 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 plant problems.	5.1 Monitor plant frequently and critically throughout shift, using measured/indicated data and senses (sight, hearing etc.) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

Procedures include all company, enterprise, site or section procedures, work instructions or policies, equipment or manufacturer's manuals, procedures or guidelines which maybe written or electronically communicated.

Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.

Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment

Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.

Emergency responses include those related to: evacuation due to fire, loss of power, excessive emissions of fumes or particulate, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress.

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Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.

Hazards may include:

- Heat (burns, dehydration and heat stress)
- Energy sources (eg hydraulic, pneumatic and electric)
- High pressure piping and valves
- Pinch and crush points
- Banned items
- Mobile equipment and pedestrian interaction
- Suspended loads and conveyors
- Hazardous materials (eg bath and carbon dust).

Out of parameter issues, faults and problems may include:

- Out of parameter operation or product
- Fluctuation in temperature, power consumption or product movement.
- Instruments and equipment requiring cleaning
- Equipment mechanical and electrical problems
- Flow path blockages
- Out of parameter emissions
- Unavailability of equipment, personnel or material.

Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.

Instrument/electrical systems may include:

- Emergency shutdown systems
- Fire systems
- Communications systems
- Utility systems.

Monitoring systems in the anode stripping area may include:

- Monitoring the operation of anode stripping and rod cleaning equipment
- Monitoring the effectiveness of each process
- Ensuring removed material is not blocking up
- Monitoring conveyors, drag chains and lines
- Mobile equipment condition
- Monitor abnormal trends in the operation of equipment or product specification.

Equipment and tools may include:

- Hand tools
- Harnesses and slings
- Materials handling equipment.

Reports and records may include:

- Routine inspections (daily readings, monthly checks)
- Scheduled maintenance activities
- Shift log sheet
- Mandatory or statutory inspections
- Hazard, accident and incident reports
- Quality inspection reports of the product.

Start up procedure will conform to site procedure and include:

- Safety and Pre-start checks
- Accessing shift logs and equipment records
- Pre-shift briefing information
- Records and reports from the previous shift.

Monitor and adjust operational variations using troubleshooting techniques may refer to the use of historical data, records, common faults, access troubleshooting lists and directives, site procedure.

Shut down procedure must follow equipment and site authorised checklist and may include communication to supply and delivery areas, communication to impacting areas, obtaining appropriate authorisations, rescheduling operations and liaison with maintenance teams.

Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.

HSE

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures eg. spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this competency unit (eg, elements 2, 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

Critical aspects

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

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

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

- Emergency responses are known.

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- Hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- Early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the clean and strip anode process including equipment, material handling systems and mobile equipment.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.

This competency may be assessed in conjunction with:

- PMAOHS200A Participate in workplace OHS procedures
- PMAOHS110A Respond to emergency situation.
- PMASUP237A Undertake crane, dogging and load transfer operations
- TDTD1097B Operate a forklift
- PMCSUP270A Move materials
- Other units which are relevant to the job.

Essential knowledge

Competence includes a comprehensive understanding of the anode stripping and rod cleaning process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes knowledge of:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements
- all items on a schematic of the anode stripping and rod cleaning process and describe the function of each
- basic principles of operation of main equipment items including: bath removal, carbon anode removal, cast iron removal, rod cleaning and reject rod process
- basic understanding of the product specifications, (including cleanliness and residue) and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

Competence includes the responding to emergency situations such as, evacuation due to fire, loss of power and excessive emissions of fumes or particulate, equipment failure and recognising hazards associated with reactive alumina, tar, pitch, kaowool, suspended loads and heat stress.

Troubleshooting a range of problems which could include anode cleaning machines, anode stacker cranes, conveyors, rotators or equipment failure.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMASMELT263A Spray carbon anodes

Unit descriptor

This competency applies to plant technicians who operate equipment to spray aluminium on carbon anodes used in the aluminium smelting process. This competency unit typically covers items of equipment, such as:

- carbon anode aluminium spray station
- molten aluminium delivery
- conveyors, power and free
- aluminium melting furnace (may require MEM4.1AA Operate melting furnaces)
- cranes (may require PMA SUP 237 Undertake crane, dogging and load transfer operations)

The plant technician would:

- operate the aluminium spray station
- operate molten aluminium delivery system
- recognise and respond to 'out of parameter' issues
- respond to emergency situations
- identify and control hazards in the workplace.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel

Prerequisites

This unit **has no** prerequisites

Element	Performance criteria
1. Plan and prepare for operations.	1.1 Interpret and confirm work requirements before proceeding 1.2 Ensure appropriate authorisations have been obtained/issued 1.3 Identify work flow path (interruptions or bottlenecks) blockage.
2. Conduct pre-start requirements to procedures.	2.1 Conduct routine pre-start equipment checks 2.2 Conduct isolation as appropriate for pre-start inspections 2.3 Prepare equipment for operation 2.4 Complete routine equipment checklists 2.5 Complete reports as required for equipment inspections.

Element	Performance criteria
3. Conduct operations to procedures.	3.1 Start up aluminium spray station equipment 3.2 Monitor equipment operation and check operational variables are within parameters. 3.3 Verify equipment performance throughout the process 3.4 Apply operating principles to resolve identified problems and adjust operational variations using trouble- shooting techniques 3.5 Shut down aluminium spray station equipment as required 3.6 Conduct routine housekeeping activities 3.7 Complete records as required for equipment operation and performance.
4. Control hazards.	4.1 Identify hazards in the production 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 plant problems.	5.1 Monitor plant frequently and critically throughout shift, using measured/indicated data and senses (sight, hearing etc.) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

Procedures include all company, enterprise, site or section procedures, work instructions or policies, equipment or manufacturer's manuals, procedures or guidelines which maybe written or electronically communicated.

Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.

Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment

Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.

Emergency responses include those related to: evacuation due to fire, loss of power, excessive emissions of fumes or particulate, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress.

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Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.

Hazards may include:

- Heat (burns, dehydration and heat stress)
- Energy sources eg hydraulic, pneumatic and electric
- High pressure piping and valves
- Pinch and crush points
- Moisture
- Banned items
- Mobile equipment and pedestrian interaction
- Suspended loads and roller conveyors
- Hazardous materials (eg reactive alumina, kaowool, tar and pitch)
- Molten materials.

Out of parameter issues, faults and problems may include:

- Out of parameter operation or product
- Fluctuation in temperature, power consumption or product movement.
- Instruments and equipment requiring cleaning
- Equipment mechanical and electrical problems
- Flow path blockages
- Out of parameter emissions
- Unavailability of equipment, personnel or material.

Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.

Instrument/electrical systems may include:

- Emergency shutdown systems
- Fire systems
- Pressure and temperature control systems
- Communications systems
- Utility systems.

Monitoring systems in the spray station area may include:

- Monitoring the operation of anode spray station equipment
- Monitoring the effectiveness of the process
- Ensuring molten aluminium is delivered as required
- Monitoring conveyors
- Monitor abnormal trends in the operation of equipment or product specification.

Equipment and tools may include:

- Hand tools
- Harnesses and slings
- Materials handling equipment.

Reports and records may include:

- Routine inspections (daily readings, monthly checks)
- Scheduled maintenance activities
- Shift log sheet
- Mandatory or statutory inspections

- Hazard, accident and incident reports
- Quality inspection reports of the product.

Start up procedure will conform to site procedure and include:

- Safety and Pre-start checks
- Accessing shift logs and equipment records
- Pre-shift briefing information
- Records and reports from the previous shift.

Monitor and adjust operational variations using troubleshooting techniques may refer to the use of historical data, records, common faults, access troubleshooting lists and directives, site procedure.

Shut down procedure must follow equipment and site authorised checklist and may include communication to supply and delivery areas, communication to impacting areas, obtaining appropriate authorisations, rescheduling operations and liaison with maintenance teams.

Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.

HSE

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures eg. spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this competency unit (eg, elements 2, 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

Critical aspects

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.

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

- Emergency responses are known.
- Hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- Early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the carbon anode spraying process including equipment, material handling systems and mobile equipment.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.

This competency may be assessed in conjunction with:

- PMAOHS200A Participate in workplace OHS procedures
- PMAOHS110A Respond to emergency situation.
- MEM4.1AA Operate melting furnaces
- PMASUP237A Undertake crane, dogging and load transfer operations
- TDTD1097B Operate a forklift
- PMCSUP270A Move materials
- Other units which are relevant to the job.

Essential knowledge

- Competence includes a comprehensive understanding of the carbon anode aluminium spray process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes knowledge of:
- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements
- all items on a schematic of the carbon anode aluminium spray station process and describe the function of each
- basic principles of operation of main equipment items including: molten aluminium delivery, power and free conveyors, spray station
- basic understanding of the product specifications, (including depth of cover and uniformity of aluminium layer) and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

Competence includes the responding to emergency situations such as, evacuation due to fire, loss of power and excessive emissions of fumes or particulate, equipment failure and recognising hazards associated with reactive alumina, tar, pitch, kaowool, suspended loads and heat stress.

Troubleshooting a range of problems which could include anode spray equipment, anode stacker cranes, conveyors, rotators or equipment failure.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMASMELT264A Start up reduction cells

Unit descriptor

This competency applies to plant technicians who start up reduction cells used in the aluminium smelting process. Typically the reduction cells would be started up after refurbishment or repair and may have a new cathode lining. This competency unit typically covers items of equipment, such as:

- reduction cell (pot)
- carbon anodes
- bakeout equipment
- cell tending equipment (may require PMA SUP 237 Undertake crane, dogging and load transfer operations)

The plant technician would:

- prepare the refurbished or repaired cell for start up
- bakeout the cathode lining
- start up the cell (including transfer of bath)
- monitor the performance of the cell, ready for operation
- recognise and respond to 'out of parameter' issues
- respond to emergency situations
- identify and control hazards in the workplace.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Plan and prepare for operations.	1.1 Interpret and confirm work require***ments*** before proceeding
	1.2 Ensure appropriate authorisations have been obtained/issued
	1.3 Identify work flow path (interruptions or bottlenecks) blockage.
2. Conduct pre-start requirements to procedures.	2.1 Conduct routine pre-start equipment checks
	2.2 Conduct isolation as appropriate for pre-start inspections
	2.3 Prepare equipment for operation
	2.4 Complete routine equipment checklists
	2.5 Complete reports as required for equipment inspections.

Element	Performance criteria
3. Start up reduction cell to procedures.	3.1 Start up reduction cell 3.2 Monitor equipment operation and check operational variables are within parameters. 3.3 Verify equipment performance throughout the process 3.4 Apply operating principles to resolve identified problems and adjust operational variations using trouble- shooting techniques 3.5 Shut down reduction cell as required 3.6 Conduct routine housekeeping activities 3.7 Complete records as required for equipment operation and performance.
4. Control hazards.	4.1 Identify hazards in the production 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 plant problems.	5.1 Monitor plant frequently and critically throughout shift, using measured/indicated data and senses (sight, hearing etc.) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

Procedures include all company, enterprise, site or section procedures, work instructions or policies, equipment or manufacturer's manuals, procedures or guidelines which maybe written or electronically communicated.

Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.

Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment

Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.

Emergency responses include those related to: leak/loss of containment, evacuation due to fire or open cell circuit, loss of power, excessive emissions of fumes or particulate, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress.

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Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.

Hazards may include:

- Heat (burns, dehydration and heat stress)
- Energy sources eg hydraulic, pneumatic and electric
- Electro magnetic effects
- High pressure piping and valves
- Pinch and crush points
- Moisture
- Banned items
- Mobile equipment and pedestrian interaction
- Suspended loads and roller conveyors
- Hazardous materials eg reactive alumina, kaowool, tar and pitch
- Molten materials.

Out of parameter issues, faults and problems may include:

- Tap out
- Out of parameter operation or product
- Fluctuation in temperature, power consumption or product movement.
- Instruments and equipment requiring cleaning
- Equipment mechanical and electrical problems
- Flow path blockages
- Out of parameter emissions
- Unavailability of equipment, personnel or material.

Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.

Instrument/electrical systems may include:

- Bake out equipment
- Emergency shutdown systems
- Fire systems
- Pressure and temperature control systems
- Communications systems
- Utility systems.

Monitoring systems may include:

- Monitoring the operation of reduction cell
- Monitoring the effectiveness of the process
- Condition of the bath
- Monitor abnormal trends in the operation of equipment or product specification.

Equipment and tools may include:

- Hand tools
- Harnesses and slings
- Materials handling equipment

Reports and records may include:

- Routine inspections (daily readings, monthly checks)
- Scheduled maintenance activities

- Computer readouts locally or in the control room
- Shift log sheet
- Mandatory or statutory inspections
- Hazard, accident and incident reports
- Quality inspection reports of the product.

Start up procedure will conform to site procedure and include:

- Safety and Pre-start checks
- Accessing shift logs and equipment records
- Pre-shift briefing information
- Records and reports from the previous shift.

Monitor and adjust operational variations using troubleshooting techniques may refer to the use of historical data, records, common faults, access troubleshooting lists and directives, site procedure.

Shut down procedure must follow equipment and site authorised checklist and may include communication to supply and delivery areas, communication to impacting areas, obtaining appropriate authorisations, rescheduling operations and liaison with maintenance teams.

Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.

HSE

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures eg. spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this competency unit (eg, elements 2, 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

Critical aspects

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

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

- Emergency responses are known.
- Hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- Early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the reduction cell process including equipment, material handling systems and mobile equipment.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.

This competency may be assessed in conjunction with:

- PMAOHS200A Participate in workplace OHS procedures
- PMAOHS110A Respond to emergency situation.
- PMCSUP270A Move materials
- Other units which are relevant to the job.

Essential knowledge

Competence includes a comprehensive understanding of the reduction cell process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes knowledge of:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements (eg. CTPV)
- all items on a schematic of the reduction cell process and describe the function of each
- basic principles of operation of main equipment items including: cathode bed, anodes and adjusters, feeders, bath conditions, current distribution
- basic understanding of the product specifications, (including depth of cover and uniformity of aluminium layer) and variations required on the input and output side
- basic understanding of the bake process (gas bake or resistor bake)
- understanding of the cell preparation process, including: cathode bed, thermocouples, feeders, fittings and connections, bake process, anode installation, bath transfer, shunt removal
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

Competence includes the responding to emergency situations such as, tap outs, evacuation due to fire, loss of power and excessive emissions of fumes or particulate, equipment failure and recognising hazards associated with electromagnetic effects, moisture, wet bath and wet soda ash.

Troubleshooting a range of problems which could include or be related to: electrical faults, interpreting information from process control system, equipment failure, cell instability, feeder problems, anode effect poles, metal tapping, bath tapping, beam height, anodes, current draw, materials handling systems, bake process, loading anodes and anode effect.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMASMELT265A Operate reduction cells

Unit descriptor

This competency applies to plant technicians who operate reduction cells for the aluminium smelting process. Typically the plant technician would monitor and adjust the operation of the cells and tap molten aluminium and bath as required. This competency unit typically covers items of equipment, such as:

- reduction cell (pot)
- carbon anodes and beams
- cell tending equipment (may require PMA SUP 237 Undertake crane, dogging and load transfer operations)

The plant technician would:

- monitor and control reduction cell operation
- conduct anode setting and change anodes as required
- conduct metal tapping
- conduct bath tapping
- conduct beam raising
- start up and shut down cells
- recognise and respond to 'out of parameter' issues
- respond to emergency situations
- identify and control hazards in the workplace.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Plan and prepare for operations.	1.1 Interpret and confirm work requirements before proceeding 1.2 Ensure appropriate authorisations have been obtained/issued 1.3 Identify work flow path (interruptions or bottlenecks) blockage.
2. Conduct pre-start requirements to procedures.	2.1 Conduct routine pre-start equipment checks 2.2 Conduct isolation as appropriate for pre-start inspections 2.3 Prepare equipment for operation 2.4 Complete routine equipment checklists 2.5 Complete reports as required for equipment inspections.

Element	Performance criteria
3. Operate reduction cell to procedures.	3.1 Monitor equipment operation and check operational variables are within parameters. 3.2 Verify equipment performance throughout the process 3.3 Apply operating principles to resolve identified problems and adjust operational variations using trouble- shooting techniques 3.4 Shut down reduction cell as required 3.5 Conduct routine housekeeping activities 3.6 Complete records as required for equipment operation and performance.
4. Control hazards.	4.1 Identify hazards in the production 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 plant problems.	5.1 Monitor plant frequently and critically throughout shift, using measured/indicated data and senses (sight, hearing etc.) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

Procedures include all company, enterprise, site or section procedures, work instructions or policies, equipment or manufacturer's manuals, procedures or guidelines which maybe written or electronically communicated.

Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.

Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment

Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.

Emergency responses include those related to: leak/loss of containment, evacuation due to fire or open cell circuit, loss of power, excessive emissions of fumes or particulates, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress.

Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.

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Hazards may include:

- Heat (burns, dehydration and heat stress)
- Energy sources eg hydraulic, pneumatic and electric
- Electro magnetic effects
- High pressure piping and valves
- Pinch and crush points
- Moisture
- Banned items
- Mobile equipment and pedestrian interaction
- Suspended loads and roller conveyors
- Hazardous materials eg reactive alumina, kaowool, and emissions
- Molten materials.

Out of parameter issues, faults and problems may include:

- Tap out
- Out of parameter operation or product
- Fluctuation in temperature, power consumption or product movement.
- Instruments and equipment requiring cleaning
- Equipment mechanical and electrical problems
- Flow path blockages
- Out of parameter emissions
- Unavailability of equipment, personnel or material.

Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.

Instrument/electrical systems may include:

- Emergency shutdown systems
- Fire systems
- Pressure and temperature control systems
- Communications systems
- Utility systems.

Monitoring systems may include:

- Monitoring the operation of reduction cell
- Monitoring the effectiveness of the process
- Condition of the bath.
- Monitor abnormal trends in the operation of equipment or product specification.

Equipment and tools may include:

- Hand tools
- Harnesses and slings
- Materials handling equipment.

Reports and records may include:

- Routine inspections (daily readings, monthly checks)
- Scheduled maintenance activities
- Computer readouts locally or in the control room
- Shift log sheet
- Mandatory or statutory inspections
- Hazard, accident and incident reports

- Quality inspection reports of the product.

Start up procedure will conform to site procedure and include:

- Safety and Pre-start checks
- Accessing shift logs and equipment records
- Pre-shift briefing information
- Records and reports from the previous shift.

Monitor and adjust operational variations using troubleshooting techniques may refer to the use of historical data, records, common faults, access troubleshooting lists and directives, site procedure.

Shut down procedure must follow equipment and site authorised checklist and may include communication to supply and delivery areas, communication to impacting areas, obtaining appropriate authorisations, rescheduling operations and liaison with maintenance teams.

Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.

HSE

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures eg. spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this competency unit (eg, elements 2, 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

Critical aspects

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:

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- Emergency responses are known.
- Hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- Early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the reduction cell process including equipment, material handling systems and mobile equipment.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.

This competency may be assessed in conjunction with:

- PMAOHS200A Participate in workplace OHS procedures
- PMAOHS110A Respond to emergency situation.
- PMCSUP270A Move materials
- Other units which are relevant to the job.

Essential knowledge

Competence includes a comprehensive understanding of the reduction line process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes knowledge of:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements (eg. CTPV)
- all items on a schematic of the reduction cell process and describe the function of each
- basic principles of operation of main equipment items including: cathode bed, anodes and adjusters, feeders, bath conditions, current distribution
- basic understanding of the product specifications, (including depth of cover and uniformity of aluminium layer) and variations required on the input and output side
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

Competence includes the responding to emergency situations such as, tap outs, evacuation due to fire, loss of power and excessive emissions of fumes or particulate, equipment failure and recognising hazards associated with electromagnetic effects, moisture, wet bath and wet soda ash.

Troubleshooting a range of problems which could include or be related to: electrical faults, interpreting information from process control system, equipment failure, cell instability, feeder problems, anode effect poles, metal tapping, bath tapping, beam height, anodes, current draw, materials handling systems, bake process, loading anodes and anode effect.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMASMELT266A Deliver molten metal

Unit descriptor

This competency applies to plant technicians who transport molten metal in the aluminium smelting process. Typically the molten aluminium would be moved using mobile transport equipment and crucibles. This competency unit typically covers items of equipment, such as:

- crucibles
- siphoning equipment
- mobile transporting equipment.

The plant technician would:

- collect filled crucibles for transportation
- move the crucible to required location
- transfer/siphon molten aluminium to the destination furnace
- recognise and respond to 'out of parameter' issues
- respond to emergency situations
- identify and control hazards in the workplace.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Plan and prepare for operations.	1.1 Interpret and confirm work requirements before proceeding
	1.2 Ensure appropriate authorisations have been obtained/issued
2. Conduct pre-start requirements to procedures.	2.1 Conduct routine pre-start equipment checks
	2.2 Conduct isolation as appropriate for pre-start inspections
	2.3 Prepare equipment for operation
	2.4 Complete routine equipment checklists
	2.5 Complete reports as required for equipment inspections.

Element	Performance criteria
3. Conduct metal delivery operations to procedures.	3.1 Start up equipment as required 3.2 Monitor equipment operation and check operational variables are within parameters. 3.3 Verify equipment performance throughout the process 3.4 Apply operating principles to resolve identified problems and adjust operational variations using trouble- shooting techniques 3.5 Shut down equipment as required 3.6 Conduct routine housekeeping activities 3.7 Complete records as required for equipment operation and performance.
4. Control hazards.	4.1 Identify hazards in the production 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 plant problems.	5.1 Monitor plant frequently and critically throughout shift, using measured/indicated data and senses (sight, hearing etc.) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

Procedures include all company, enterprise, site or section procedures, work instructions or policies, equipment or manufacturer's manuals, procedures or guidelines which maybe written or electronically communicated.

Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.

Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment

Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.

Emergency responses include those related to: leak/loss of containment, evacuation due to fire or open cell circuit, loss of power, excessive emissions of fumes or particulate, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress.

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Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.

Hazards may include:

- Heat (burns, dehydration and heat stress)
- Energy sources eg hydraulic, pneumatic and electric
- Electro magnetic effects
- High pressure piping and valves
- Pinch and crush points
- Moisture
- Banned items
- Mobile equipment and pedestrian interaction
- Suspended loads
- Hazardous materials (eg chlorine)
- Furnace emissions
- Molten materials.

Out of parameter issues, faults and problems may include:

- Delivery of molten metal from reduction cells to clean crucible
- Pipe failures (eg cracks, blockages)
- Venturi and siphon system failure
- Siphoning suction equipment failure
- Out of parameter operation or product
- Fluctuation in temperature, power consumption or product movement.
- Instruments and equipment requiring cleaning
- Equipment mechanical and electrical problems
- Flow path blockages
- Out of parameter emissions
- Unavailability of equipment, personnel or material.

Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.

Instrument/electrical systems may include:

- Emergency shutdown systems
- Fire systems
- Pressure and temperature control systems
- Communications systems
- Utility systems.

Monitoring systems may include:

- Monitoring the operation of crucibles, crucible transport equipment, furnaces
- Monitoring the effectiveness of the process
- Monitor abnormal trends in the operation of equipment or product specification.

Equipment and tools may include:

- Hand tools
- Harnesses
- Crucible transport equipment
- EWE
- Forklift

- Furnace tending vehicle
- Other materials handling equipment (fixed and mobile).

Reports and records may include:

- Routine inspections (daily readings, monthly checks)
- Scheduled maintenance activities
- Analysis of furnace metal specifications
- Computer readouts locally or in the control room
- Shift log sheet
- Mandatory or statutory inspections
- Hazard, accident and incident reports
- Quality sample records of the product.

Start up procedure will conform to site procedure and include:

- Safety and Pre-start checks
- Accessing shift logs and equipment records
- Pre-shift briefing information
- Records and reports from the previous shift.

Monitor and adjust operational variations using troubleshooting techniques may refer to the use of historical data, records, common faults, access troubleshooting lists and directives, site procedure.

Shut down procedure must follow equipment and site authorised checklist and may include communication to supply and delivery areas, communication to impacting areas, obtaining appropriate authorisations, rescheduling operations and liaison with maintenance teams.

Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.

HSE

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures eg. spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this competency unit (eg, elements 2, 5). Simulation should be based on the actual plant and will include

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walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

Critical aspects

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

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

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

- Emergency responses are known.
- Hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- Early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the metal delivery process including equipment, material handling systems and mobile equipment.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.

This competency may be assessed in conjunction with:

- PMAOHS200A Participate in workplace OHS procedures
- PMAOHS110A Respond to emergency situation.
- PMCSUP270A Move materials
- MEM4.1A Operate a melting furnace
- MEM4.7AA Pour molten metal
- Other units which are relevant to the job.

Essential knowledge

Competence includes a comprehensive understanding of crucibles, transporters and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes knowledge of:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and housekeeping requirements
- all items on a schematic of the siphon equipment, delivery equipment and describe the function of each

- basic principles of operation of main equipment items including: siphoning equipment and crucible transport equipment
- basic understanding of the product specifications and variations required on the input and output side
- isolation of equipment
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

Competence includes the responding to emergency situations such as, evacuation due to fire and chlorine, loss of power and excessive emissions of fumes or particulate, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress and equipment failure.

Troubleshooting a range of problems which could include delivery of molten metal, furnace operation and cleaning problems, interpreting information on the control system, maintenance system or equipment failure.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMASMELT267A Cast aluminium ingots

Unit descriptor

This competency applies to plant technicians who cast aluminium ingots using mould casting methods. This competency unit typically covers items of equipment, such as:

- tilting furnace
- launders
- casting moulds and/or casting wheel equipment
- stacking and strapping equipment

The plant technician would:

- pour molten aluminium from the holding furnace to delivery launders
- operate the casting equipment
- stack and strap ingots as required
- recognise and respond to 'out of parameter' issues
- respond to emergency situations
- identify and control hazards in the workplace.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

If crane use is required, see also PMA SUP 237 Undertake crane, dogging and load transfer operations.

This unit does NOT require the operation of a central control panel.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Plan and prepare for operations.	1.1 Interpret and confirm work requirements before proceeding 1.2 Ensure appropriate authorisations have been obtained/issued 1.3 Identify work flow path (interruptions or bottlenecks) blockage.
2. Conduct pre-start requirements to procedures.	2.1 Conduct routine pre-start equipment checks 2.2 Conduct isolation as required for pre-start inspections 2.3 Prepare equipment for operation 2.4 Complete routine equipment checklists 2.5 Complete reports as required for equipment inspections.

Element	Performance criteria
3. Conduct aluminium casting operations to procedures.	3.1 Start up equipment as required 3.2 Monitor equipment operation and check operational variables are within parameters. 3.3 Verify equipment performance throughout the process 3.4 Apply operating principles to resolve identified problems and adjust operational variations using trouble- shooting techniques 3.5 Shut down equipment as required 3.6 Conduct routine housekeeping activities 3.7 Complete records as required for equipment operation and performance.
4. Control hazards.	4.1 Identify hazards in the production 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 plant problems.	5.1 Monitor plant frequently and critically throughout shift, using measured/indicated data and senses (sight, hearing etc.) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

Procedures include all company, enterprise, site or section procedures, work instructions or policies, equipment or manufacturer's manuals, procedures or guidelines which maybe written or electronically communicated.

Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.

Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment

Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.

Emergency responses include those related to: leak/loss of containment, evacuation due to fire or open cell circuit, loss of power, excessive emissions of fumes or particulate, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress.

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Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.

Hazards may include:

- Heat (burns, dehydration and heat stress)
- Energy sources eg hydraulic, pneumatic and electric
- High pressure piping and valves
- Pinch and crush points
- Moisture
- Mobile equipment and pedestrian interaction
- Hazardous materials
- Furnace and crucible emissions
- Molten materials.

Out of parameter issues, faults and problems may include:

- Out of parameter operation or product
- Fluctuation in temperature, air pressure, power consumption or product movement.
- Instruments and equipment requiring cleaning
- Equipment mechanical and electrical problems
- Flow path blockages
- Out of parameter emissions
- Unavailability of equipment, personnel or material.

Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.

Instrument/electrical systems may include:

- Emergency shutdown systems
- Fire systems
- Pressure and temperature control systems
- Communications systems
- Utility systems.

Monitoring systems may include:

- Monitoring the effectiveness of the process
- Monitor abnormal trends in the operation of equipment or product specification.

Equipment and tools may include:

- Hand tools
- Slings
- Materials handling equipment (fixed and mobile).

Reports and records may include:

- Routine inspections (daily readings, monthly checks)
- Scheduled maintenance activities
- Quality sample records
- Computer read-outs locally or in the control room
- Shift log sheet
- Mandatory or statutory inspections
- Hazard, accident and incident reports

- Quality inspection reports of the product.

Start up procedure will conform to site procedures and include:

- Safety and pre-start checks
- Accessing shift logs and equipment records
- Pre-shift briefing information
- Records and reports from the previous shift.

Monitor and adjust operational variations using troubleshooting techniques may refer to the use of historical data, records, common faults, access troubleshooting lists and directives, site procedure.

Shut down procedure must follow equipment and site authorised checklist and may include communication to supply and delivery areas, communication to impacting areas, obtaining appropriate authorisations, rescheduling operations and liaison with maintenance teams.

Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.

HSE

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures eg. spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this competency unit (eg, elements 2, 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

Critical aspects

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:

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- Emergency responses are known.
- Hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- Early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the casting process including equipment, material handling systems and mobile equipment.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.

This competency may be assessed in conjunction with other relevant competencies such as:

- PMAOHS200A Participate in workplace OHS procedures
- PMAOHS110A Respond to emergency situation.
- PMASUP237A Undertake crane, dogging and load transfer operations
- PMCSUP270A Move materials
- MEM4.1A Operate a melting furnace
- MEM4.7AA Pour molten metal
- Other units which are relevant to the job.

Essential knowledge

Competence includes a comprehensive understanding of the casting process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes knowledge of:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements
- all items on a schematic of the metal delivery, casting and ingot stacking equipment and describe the function of each
- basic principles of operation of main equipment items including: metal delivery, casting and ingot stacking equipment
- basic understanding of the product specifications and variations required on the input and output side
- isolation of equipment
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

Competence includes the responding to emergency situations such as, evacuation due to fire and the escape of chlorine, loss of power and excessive emissions of fumes or particulate, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress and equipment failure.

Troubleshooting a range of problems which could include casting equipment, furnace operation and cleaning problems, interpreting information on the control system, maintenance system or equipment failure.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMASMELT268A Vertical Direct Casting

Unit descriptor

This competency applies to plant technicians who cast aluminium using the Vertical Direct Chill Casting process (referred to as Vertical Direct Casting or VDC) used for production of aluminium slabs, billet or T bar, using electrical furnace extrusion technology. This competency unit typically covers items of equipment, such as:

- casting furnace and launders
- Vertical Direct Casting equipment, including casting table
- billet and T-Bar saws and associated equipment
- inspection station homogenisers
- mobile transporting equipment.

The plant technician may:

- deliver molten aluminium from the tilt furnace to the launders and casting equipment
- operate the VDC equipment
- operate the saw, as required
- product inspection, as required
- recognise and respond to 'out of parameter' issues
- respond to emergency situations
- identify and control hazards in the workplace.

Generally the operator would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Plan and prepare for operations.	1.1 Interpret and confirm work requirements before proceeding 1.2 Ensure appropriate authorisations have been obtained/issued 1.3 Identify work flow path (interruptions or bottlenecks) blockage.
2. Conduct pre-start requirements to procedures.	2.1 Conduct routine pre-start equipment checks 2.2 Conduct isolation as appropriate for pre-start inspections 2.3 Prepare equipment for operation 2.4 Complete routine equipment checklists 2.5 Complete reports as required for equipment inspections.

Element	Performance criteria
3. Conduct VDC operations to procedures.	3.1 Start up equipment as required 3.2 Monitor equipment operation and check operational variables are within parameters. 3.3 Verify equipment performance throughout the process 3.4 Apply operating principles to resolve identified problems and adjust operational variations using trouble- shooting techniques 3.5 Shut down equipment as required 3.6 Conduct routine housekeeping activities 3.7 Complete records as required for equipment operation and performance.
4. Control hazards.	4.1 Identify hazards in the production 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 plant problems.	5.1 Monitor plant frequently and critically throughout shift, using measured/indicated data and senses (sight, hearing etc.) as appropriate 5.2 Recognise operational problems 5.3 Analyse cause of operational problems within scope of skill level 5.4 Take timely and appropriate action to solve operational problems.

Range of variables

Context

Procedures include all company, enterprise, site or section procedures, work instructions or policies, equipment or manufacturer's manuals, procedures or guidelines which maybe written or electronically communicated.

Work requirements includes shift briefings, shift logs supervisor or crew leader meetings, toolbox talks and handover details.

Hazard control measures should follow the hierarchy of control, be specific to the hazard and work area and include relevant Personal Protective Equipment

Isolation refers to the complete isolation of the equipment from all sources of power or energy or isolate process flows and movement of machinery such to render it safe to work on as per site procedure.

Emergency responses include those related to: leak/loss of containment, evacuation due to fire or open cell circuit, loss of power, excessive emissions of fumes or particulate, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress.

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Personal Protective Equipment (PPE) requirements relate to the specified PPE for the task or job to be undertaken. PPE may include specific insulated boots, heat resistant material, full-ventilated suits, full-face masks or situation specific equipment.

Hazards may include:

- Heat (burns, dehydration and heat stress)
- Energy sources eg hydraulic, pneumatic and electric
- High pressure piping and valves
- Pinch and crush points
- Moisture
- Banned items
- Mobile equipment and pedestrian interaction
- Suspended loads
- Hazardous materials
- Furnace emissions
- Oxygen and chlorine level fluctuations
- Molten materials.

Out of parameter issues, faults and problems may include:

- Delivery of molten metal from furnace
- Pipe failures (eg cracks, blockages)
- Out of parameter operation or product
- Fluctuation in temperature, air pressure, power consumption or product movement.
- Instruments and equipment requiring cleaning
- Equipment mechanical and electrical problems
- Flow path blockages
- Out of parameter emissions
- Unavailability of equipment, personnel or material.

Pre-start checks relate to the required site or equipment pre-start checklist and must be completed before the equipment is operated or as otherwise stated in the procedures.

Instrument/electrical systems may include:

- Emergency shutdown systems
- Fire systems
- Pressure and temperature control systems
- Communications systems
- Utility systems.

Monitoring systems may include:

- Monitoring the operation of the VDC process
- Monitor the operation of the furnace, whilst casting
- Monitor the operation of the billet and T bar saw
- Monitoring the effectiveness of the process
- Monitor abnormal trends in the operation of equipment or product specification.

Equipment and tools may include:

- Hand tools
- Harnesses and slings

- Materials handling equipment (fixed and mobile).

Reports and records may include:

- Routine inspections (daily readings, monthly checks)
- Scheduled maintenance activities
- Quality sample records
- Computer readouts locally or in the control room
- Shift log sheet
- Mandatory or statutory inspections
- Hazard, accident and incident reports
- Quality inspection reports of the product.

Start up procedure will conform to site procedure and include:

- Safety and Pre-start checks
- Accessing shift logs and equipment records
- Pre-shift briefing information
- Records and reports from the previous shift.

Monitor and adjust operational variations using troubleshooting techniques may refer to the use of historical data, records, common faults, access troubleshooting lists and directives, site procedure.

Shut down procedure must follow equipment and site authorised checklist and may include communication to supply and delivery areas, communication to impacting areas, obtaining appropriate authorisations, rescheduling operations and liaison with maintenance teams.

Housekeeping procedure may include cleaning the area, removal of contaminants, safety inspections and rectification of issues that could compromise safety.

HSE

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures eg. spills and leaks identified, contained and cleaned up. Exposure to hazardous materials requires minimal personal contact, recognition of hazards and appropriate controls.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this competency unit (eg, elements 2, 5). Simulation should be based on the actual plant and will include

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walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

Critical aspects

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

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

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

- Emergency responses are known.
- Hazards are recognised and all site requirements to reduce or remove hazards are known and completed as part of the job.
- Early warning signs of equipment/processes needing attention or with potential problems are recognised, that is, monitoring systems in the VDC process including equipment, material handling systems and mobile equipment.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with other relevant units.

This competency may be assessed in conjunction with:

- PMAOHS200A Participate in workplace OHS procedures
- PMAOHS110A Respond to emergency situation.
- PMASUP237A Undertake crane, dogging and load transfer operations
- PMCSUP270A Move materials
- MEM4.1A Operate a melting furnace
- MEM4.7AA Pour molten metal
- Other units which are relevant to the job.

Essential knowledge

Competence includes a comprehensive understanding of the VDC process and equipment principles and typical problems to a level needed to control the operation, and recognise and resolve operational problems. In particular it includes knowledge of:

- awareness of hazardous materials, recognition of spills or escapes, personal protective equipment required, isolation and clean up requirements
- all items on a schematic of the furnace, launders and VDC equipment, and describe the function of each

- basic principles of operation of main equipment items including furnace, launders and VDC equipment
- basic understanding of the product specifications and variations required on the input and output side
- understanding of the VDC process
- isolation of equipment
- isolating a problem to an item of equipment/stage of process
- methods of resolving problems.

Competence includes the responding to emergency situations such as, evacuation due to fire and the escape of chlorine, loss of power and excessive emissions of fumes or particulate, major oil spill, equipment failure and recognising hazards associated with heat, electricity, hydraulics and pneumatics and high pressure piping and valves, pinch and crush points on conveyor systems, mobile equipment, hazardous materials, banned items, suspended loads, hydration and heat stress and equipment failure.

Troubleshooting a range of problems which could include VDC equipment, launders, furnace operation, billet saw, T bar saw and cleaning problems, interpreting information on the control system, maintenance system or equipment failure.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

FDFCORGMP2A Implement good manufacturing practice

Unit descriptor

This unit involves applying the Code of Good Manufacturing Practice (GMP) to prevent physical, chemical and biological contamination and control waste and pests. In PMA02 it is only relevant to processes manufacturing goods subject to the Therapeutic Goods Act or other similar food or pharmaceutical related processes.

Element	Performance criteria
1. Prevent physical contamination.	1.1 Good manufacturing practice is applied to prevent physical contamination 1.2 Critical points which impact on physical contamination are monitored to ensure appropriate control of contaminants 1.3 Physical contamination is identified, rectified and/or reported 1.4 Potential sources of physical contamination are identified and reported.
2. Prevent chemical contamination.	2.1 Good manufacturing practice is applied to prevent chemical contamination 2.2 Critical points which impact on chemical contamination are monitored to ensure appropriate control of contaminants 2.3 Chemical contamination is identified, rectified and/or reported 2.4 Potential sources of chemical contamination are identified and reported.
3. Prevent biological contamination.	3.1 Good manufacturing practice is applied to prevent biological contamination 3.2 Critical points which impact on biological contamination are monitored to ensure appropriate control of contaminants 3.3 Biological contamination is identified, rectified and/or reported 3.4 Potential sources of biological contamination are identified and reported.
4. Control waste and pests.	4.1 Waste is classified and disposed according to good manufacturing practice 4.2 Potential waste and pest problems are identified and reported.

Range of variables

The range of variables provides further advice to interpret the scope and context of this unit of competence.

It assumes:

- work is carried out within company policy and procedures, food safety, good manufacturing practice and legislative requirements
- the process used maybe computer controlled or manually controlled or a combination
- stock handled by the operator may include raw materials, ingredients, consumables, in-process product, finished product
- contaminants may be classified as physical, chemical, biological
- control points, inspection and tests requirements are contained in company plans/procedures
- equipment is available to detect contaminants
- reporting systems may include electronic and manual data recording and storage systems.

Evidence guide

The evidence guide identifies the skills and knowledge to be demonstrated to confirm competence for this unit. It should be read in conjunction with the range of variables.

Demonstrated ability to:

- monitor control points to identify risk of contaminants
- locate contamination
- follow GMP to remove/isolate problem
- take action to prevent contamination occurring or recurring
- sort and dispose waste materials
- identify presence of pests
- record workplace information.

Underpinning knowledge

- purpose and significance of compliance with the Code of Good Manufacturing Practice in preventing contamination
- the relationship between the Code of Good Manufacturing Practice and standard operating procedures, instructions, processes and procedures
- common types of physical, chemical and biological contaminants
- conditions which cause physical, chemical and biological contamination
- procedures for preventing contamination
- procedures for investigating contamination
- the effect of contamination on products, consumers and the company
- control points in the management of contamination
- common methods used to prevent contamination
- types of waste and the handling methods
- requirements for classifying and handling solid and liquid waste
- pest prevention and control methods and procedures
- reporting/recording systems and processes.

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Unit title

PMAOPS300A Operate a production unit

Unit descriptor

This competency covers the situation where the operations technician operates an enterprise specific unit of a production plant, which is not otherwise described by other units in this Training Package. The operations technician is expected to demonstrate a significant understanding of the process and the equipment operation AND the production unit involves at least two other prerequisite process competencies, which must be operated as part of the production unit. This competency covers the operation of a unit of equipment, which includes the operation of equipment ancillary to the main production unit.

It does NOT include the operation of any packaged unit (regardless of its engineering complexity) which are covered by PMAOPS100A 'Apply procedures to equipment operation'.

The operations technician would:

- identify and rectify operational problems
- predict the potential impact of the production unit output on the operation of the whole plant
- facilitate output changes

Generally the operations technician would operate independently in a plant with local control or in liaison with the control room operator in a plant with Distributed Control System (DCS) type controls. In the case of large complex plant, the operations technician would be part of a team during startup and shutdown procedures. The operations technician would be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

Prerequisites

This unit **has** prerequisites of *at least two* relevant OPS 200 series units.

Element	Performance criteria
1. Start up unit.	1.1 Perform pre-start-up checks 1.94 Start up individual items of equipment and the entire unit 1.95 Start up normally and after maintenance 1.96 Build rate steadily 1.97 Stabilise operation to produce specified rate and quality within minimum time.

Element	Performance criteria
2. Monitor and control the unit.	2.1 Complete routine checks, logs and paperwork 2.2 Recognise the signs of potential and actual problems 2.3 Take action to minimise the impact on safety, health, the environment and the business of potential and actual problems 2.4 Monitor critical variables and take action as required 2.5 Trim plant to achieve required output rate and quality while maximising plant efficiency.
3. Change unit output rate, grade or specification.	3.1 Predict the need to make a change to meet process requirements 3.2 Trim unit in preparation of changes 3.3 Make changes as required 3.4 Manage changes smoothly and in a timely manner 3.5 Minimise out of specification product/process disruptions as a result of the change.
4. Maintain plant effectiveness.	4.1 Frequently and critically monitor all plant throughout shift 4.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant 4.3 Identify critical equipment/processes and tune their performance 4.4 Identify issues likely to impact on plant performance and take appropriate action 4.5 Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people 4.6 Test trips and alarms 4.7 Complete minor maintenance according to procedures.
5. Shut down unit.	5.1 Determine type of shut down required 5.2 Give advance warning of shut down where possible 5.3 Change over individual items of equipment 5.4 Shut down individual items of equipment and the entire unit 5.5 Shut down to a standby condition if appropriate 5.6 Shut down in an emergency and otherwise when required 5.7 Prepare plant for maintenance/vessel entry as required 5.8 Receive plant back from maintenance 5.9 Reset trips and alarms after a shut down 5.10 Prepare plant for the introduction of chemicals and operation 5.11 Leave plant in a condition ready to restart 5.12 Shut down for maintenance when required.

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Element	Performance criteria
6. Control hazards	6.1 Identify hazards in work area 6.2 Assess the risks arising from those hazards 6.3 Implement measures to control those risks in line with procedures and duty of care.
7. Resolve 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.

Range of variables

Context

This unit of competency applies where the plant technician operates a unit of plant which is not otherwise described. The other 300 series process competencies should be used as an indicative guide as to the coverage and complexity of the operation.

This competency unit includes all items of equipment and unit operations which form part of the operation of the unit. This must include at least two of:

- fluid flow equipment
- fluid mixing equipment
- chemical storage
- utilities and services
- heat exchangers
- separation equipment
- powered separation equipment
- chemical separation equipment
- tank farming operations
- particulates processing equipment
- manufacturing extruders

and may also include other equipment as well as the unit itself.

Typical problems include:

- recognising and acting on unstable/sub-optimal operation
- control of critical variables and outputs
- variations in feed rates and quality, etc.

All operations are performed in accordance with procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 and 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

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In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes an understanding of the production unit and its integral equipment to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the production unit and describe the function of each
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- describe the basis of the process used in the production unit to transform the feed materials into the product, including the basic chemistry of the process (where relevant)
- describe the causes and remedies of common problems such as those selected in the range of variables
- describe methods of changing rate 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 production unit and to be able to distinguish between causes of problems/alarm/fault indications such as:

- process materials variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

as is relevant to the practical operation of equipment at that job level.

This knowledge is required of all major items of equipment which comprise the production unit.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS301A Produce products by distillation

Unit descriptor

In a typical scenario an operations technician would be monitoring and controlling the distillation section of a plant which is separating two or more components. The process may be controlled from a central control panel, in order to achieve a finished product meeting a predetermined specification.

The distillation column may be trayed or packed and may be performing cryogenic gas distillation, liquid distillation, azeotropic distillation, fractional distillation, vacuum distillation or molten metal distillation.

Each tower may be provided with:

- reboiler/heater
- feed at an appropriate temperature
- over head product condenser
- reflux equipment
- tower internals
- instrumentation.

The operations technician will be able to:

- identify and correct operational problems
- determine the impact of composition changes and adjust accordingly
- direct members of the operational team under start up and running conditions.

This unit does NOT require the operation of a central control panel.

Generally the operations technician would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has the** prerequisites of:

- PMAOPS201A Operate fluid flow equipment
- PMAOPS205A Operate heat exchangers.

Element	Performance criteria
1. Start up distillation system.	1.1 Perform pre-start up checks 1.98 Bring into operation equipment required for distillation 1.99 Correctly sequence all rotating equipment required before commencing the process 1.100 Monitor temperature increase during start up and take corrective action if required 1.101 Stabilise distillation system to produce specified rate and quality within minimum time.

Element	Performance criteria
2. Monitor distillation process.	2.1 Continually monitor process systems to ensure that product specifications are maintained 2.2 Minimise the risk of product specification deviations during the process by applying process knowledge 2.3 Adjust process variables to ensure the product remains within specification 2.4 Identify issues likely to impact on plant performance and take appropriate action 2.5 Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people 2.6 Record product movements as a historical record of the quantity and quality of the finished product.
3. Change production rates and/or product specification.	3.1 Predict the need to make change to meet process requirements 3.2 Manipulate unit temperatures to achieve product specifications 3.3 Trim plant in a manner which prepares it for the transition 3.4 Manage transitions smoothly and in a timely manner 3.5 Minimise out of specification material as a result of a transition.
4. Shut down distillation systems.	4.1 Determine type of shut down required 4.2 Give advanced warning of shut down where possible 4.3 Change over individual items of equipment 4.4 Shut down individual items of equipment and the entire reaction system 4.5 Shut down to a stand-by condition if required 4.6 Shut down in an emergency when required 4.7 Reset trips and alarms after a shut down 4.8 Leave plant in a condition ready to restart 4.9 Shut down for maintenance when required.
5. Prepare distillation unit for maintenance.	5.1 Inform plant personnel of impending maintenance activity 5.2 Prepare unit for maintenance/vessel entry as required according to procedures 5.3 Complete minor maintenance according to procedures 5.4 Test trips and alarms on a regular basis 5.5 Accept plant back from maintenance 5.6 Prepare plant for the introduction of hydrocarbons/ chemicals and operation.
6. Control hazards.	6.1 Identify hazards in distillation area of work 6.2 Assess the risk arising from these hazards 6.3 Implement control measures for these risks in line with procedures and duty of care.

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Element	Performance criteria
7. Resolve problems.	7.1 Identify problems needing action 7.2 Determine possible fault causes 7.3 Rectify problems using appropriate solution in area of responsibility 7.4 Follow up items initiated until resolved 7.5 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the distillation system. For your plant this may include (select relevant items):

- columns/towers
- trays/packing
- boilers/reboilers
- condensers
- heat exchangers
- refrigerant compressors
- pumps
- valves.

Typical problems for your plant may include:

- flooding
- channelling (packed column)
- dumping
- entrainment.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1- 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive

systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of distillation units and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS201A Operate fluid flow equipment
- PMAOPS222A Operate and monitor pumping systems and equipment
- PMAOPS205A Operate heat exchangers.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- architecture of the process/production system
- tolerances, limitations and specifications required
- systems operating parameters

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- process control philosophies and strategies
- outside process/production operations (including column, tray/packing and boiler operations) and distillation principles (including stripping and rectification)
- heating and cooling principles
- stabilisation principles.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the distillation system and to distinguish between causes of problems/alarm/fault indications such as:

- process feed variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS302A Operate reactors and reaction equipment

Unit descriptor

Typically an operations technician would be looking after the operation of a production unit which, as its prime function, causes and controls a chemical reaction. It includes the operation of equipment ancillary to the main reactor. The reactor or reaction equipment includes types of reactors such as:

- batch
- continuous
- catalytic
- fluidised bed.

The plant technician would:

- identify and rectify operational problems
- run all aspects of the reactor operation, including start-up and shut down
- monitor and manage the supply of raw materials and output of product
- adjust product properties to meet specifications.

Generally the plant technician would operate independently in a plant with local control or in liaison with the control room operator in a plant with centralised/distributed control system (DCS) type controls. The plant technician would be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

Prerequisites

This unit **has** the prerequisites of:

- PMAOPS201A Operate fluid flow equipment
- PMAOPS202A Operate fluid mixing equipment
- PMAOPS205A Operate heat exchangers.

Element	Performance criteria
1. Start up reaction systems.	1.1 Perform pre-start-up checks 1.102 Start up individual items of equipment and the entire reactor system 1.103 Start up from standby and after maintenance 1.104 Build reaction rate steadily with no surges or lulls 1.105 Stabilise reaction system to produce in specification product at specified rates within minimum time.

Element	Performance criteria
2. Monitor and control the reaction process.	2.1 Complete routine checks logs and paperwork 2.2 Recognise the signs of potential and actual problems 2.3 Take action to minimise the impact on safety, health, the environment and the business of potential and actual problems 2.4 Monitor condition of catalyst (if appropriate) and take action to maintain production schedule and quality 2.5 Monitor materials and stock levels of feeds and take action to maintain production schedule and quality 2.6 Trim plant to achieve required rates and quality while maximising plant efficiency.
3. Change production rates and/or product grade/specification.	3.1 Predict from rates and schedule when a transition will be required 3.2 Give advanced notice of transition to work team 3.3 Trim plant in a manner which prepares it for the transition 3.4 Manage transitions smoothly and in a timely manner 3.5 Minimise scrap/off grade as a result of a transition.
4. Maintain plant effectiveness.	4.1 Frequently and critically monitor all plant throughout shift 4.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant 4.3 Identify critical equipment/processes and tune their performance 4.4 Identify issues likely to impact on plant performance and take appropriate action 4.5 Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people 4.6 Test trips and alarms 4.7 Complete minor maintenance according to procedures.
5. Shut down reaction systems.	5.1 Determine type of shut down required 5.2 Give advance warning of shut down where possible 5.3 Change over individual items of equipment 5.4 Shut down individual items of equipment and the entire reaction system 5.5 Shut down to a stand-by condition if required 5.6 Shut down in an emergency when required 5.7 Prepare plant for maintenance/vessel entry as required 5.8 Receive plant back from maintenance 5.9 Reset trips and alarms after a shut down 5.10 Prepare plant for the introduction of chemicals and operation 5.11 Leave plant in a condition ready to restart 5.12 Shut down for maintenance when required.
6. Clean reactors/vessels.	6.1 Identify cleaning requirements

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Element	Performance criteria
	6.2 Clean to requirements according to procedures.
7. Control hazards.	7.1 Identify hazards in reactor 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.
8. Resolve problems.	8.1 Identify possible problems in 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 Follow through items initiated until final resolution has occurred 8.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This competency unit includes all such items of equipment and unit operations which form part of the reaction system. Typically this will include:

- pumps
- valves
- mixers and
- heat exchangers/jackets/coils.

and may also include other equipment as well as the reaction vessel itself.

Typical problems include:

- variations in catalyst activity
- control of exotherm/endotherm
- adjustments to meet product specifications
- variations in feed rates/quality.

All operations are performed in accordance with procedures.

HSE

All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Plant technicians should be able to determine safe working practice using the relevant materials safety data sheets (MSDSs).

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg elements 1,5 and 6). 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

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- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Competence includes an understanding of the reaction system and its integral equipment to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the reaction system and describe the function of each
- distinguish between elements, compounds and mixtures in their raw materials and products
- describe the nature/condition of materials at each stage of the reaction, the changes which have occurred in that stage and why they have occurred
- describe reaction in chemical terms, including the effect of changing reaction variables (eg, temperature, pressure, catalyst, concentration, pH)
- state the type of reactor(s) used and their characteristics (advantages and limitations)
- describe the methods of controlling the reaction (including rate and yield)
- describe the causes and remedies of common problems such as those selected in the range of variables.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the reaction system and to distinguish between causes of problems/alarm/fault indications such as:

- raw materials variations
- instrument failure/wrong reading
- equipment failure (electrical/mechanical)
- mechanical failure
- operational problems

as is relevant to the practical operation of equipment at that job level.

This knowledge is required of all major items of equipment which comprise the reaction system.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS303A Operate furnaces

Unit descriptor

In a typical scenario, an operating technician in a plant looks after the operation of a furnace, which may be used to cause and control the cracking of oil or gas, the smelting of ore or other process function. The furnace is not used primarily to generate heat or raise steam, but rather to cause a chemical change which requires high temperatures (and which may or may not be assisted by other means). It includes the operation of equipment ancillary to the main furnace.

This competency unit covers items of equipment such as:

- thermal cracking furnaces
- catalytic cracking furnaces
- reduction furnaces
- cabin type
- cylindrical or vertical.

It does NOT include packaged furnaces which are covered by *PMAOPS100A Operate equipment*, or furnaces used for the production of steam, which is covered by *UTPNEG162A Operate boiler steam/water cycle*.

The plant technician would:

- identify and rectify operational problems
- predict the potential impact of furnace output on the operation of the whole plant
- facilitate output changes.

Generally the plant technician would be part of a team during startup and shutdown procedures and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

Prerequisites

This unit **has** the prerequisites of:

- PMAOPS201A Operate fluid flow equipment, OR
- PMAOPS204A Use utilities and services.

Element	Performance criteria
1. Start up furnace.	1.1 Perform pre-start-up checks 1.106 Start up individual items of equipment and the entire furnace system 1.107 Start up from standby and after maintenance 1.108 Build production rate steadily with no surges or lulls 1.109 Stabilise system to produce in specification product at specified rates within minimum time.

Element	Performance criteria
2. Monitor and control the reaction process.	2.1 Complete routine checks, logs and paperwork 2.2 Recognise the signs of potential and actual problems 2.3 Take action to minimise the impact on safety, health, the environment and the business of potential and actual problems 2.4 Monitor condition of catalyst (if any) and take action to maintain production schedule and quality 2.5 Monitor availability of feeds and take action to maintain production schedule and quality 2.6 Remove product as appropriate 2.7 Trim plant to achieve required rates and quality while maximising plant efficiency.
3. Change production rates and/or product specification.	3.1 Predict from rates and schedule when a transition will be required 3.2 Give advanced notice of transition to work team 3.3 Trim plant in a manner which prepares it for the change 3.4 Manage changes smoothly and in a timely manner 3.5 Minimise off grade as a result of a transition.
4. Maintain plant effectiveness.	4.1 Frequently and critically monitor all plant throughout shift 4.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant 4.3 Identify critical equipment/processes and tune their performance 4.4 Identify issues likely to impact on plant performance and take appropriate action 4.5 Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people 4.6 Test trips and alarms 4.7 Complete minor maintenance according to procedures.
5. Shut down furnace.	5.1 Determine type of shut down required 5.2 Give advance warning of shut down where possible 5.3 Change over individual items of equipment 5.4 Shut down individual items of equipment and the entire furnace system 5.5 Shut down to a stand-by condition if required 5.6 Shut down in an emergency when required 5.7 Prepare plant for maintenance/vessel entry as required 5.8 Receive plant back from maintenance 5.9 Reset trips and alarms after a shut down 5.10 Prepare plant for the introduction of hydrocarbons and operation 5.11 Leave plant in a condition ready to restart.

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Element	Performance criteria
6. Control hazards.	6.1 Identify hazards in furnace work area 6.2 Assess the risks arising from those hazards 6.3 Implement measures to control those risks in line with procedures and duty of care.
7. Resolve 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.

Range of variables

Context

This competency unit includes all such items of equipment and unit operations which form part of the furnace system. Typically this may include:

- pumps
- valves
- utilities and services
- heat exchangers and/or scrubbers
- fuel systems
- tapping systems

and may also include other equipment as well as the furnace itself.

Typical problems include:

- soot blowing
- control of draft, fuel and air
- variations in catalyst activity (where appropriate)
- control of temperature and cracking/product rate/quality
- variations in feed rates/quality.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 and 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

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Essential knowledge

Competence includes an understanding of the compressor system and its integral equipment to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the furnace system and describe the function of each, including furnace components such as
    - burner
    - convection section
    - radiation section
    - floor/walls including insulation (refractory)
    - stack/damper (flue type)
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- describe the principles of operation of the furnace, including: combustion principles, draft, burner design, excess air/flue CO/CO_2
- describe the importance of flame patterns/flame impingement
- describe the causes and remedies of common problems such as those selected in the range of variables
- describe methods of changing rate 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 furnace system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- process materials variations
- chemical processes (including combustion)
- instrument failure/wrong reading
- equipment (mechanical/electrical problems)
- operational problem

as is relevant to the practical operation of equipment at that job level.

This knowledge is required of all major items of equipment which comprise the furnace system.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS304A Operate and monitor compressor systems and equipment

Unit descriptor

In a typical scenario, an operations technician in a large plant looks after the operation of a complex compressor system. At the heart of the compressor system would be a reciprocating or rotary (screw or centrifugal) compressor capable of high pressure and high volume. These compressors would be distinguished by features such as:

- multistage compression
- intercoolers
- advanced lubrication and seal systems
- surge control systems.

This unit does NOT:

- require the operation of a central control panel
- apply to a packaged compressor, regardless of how large it may be, which is covered by *PMAOPS100A Use equipment to procedures.*

The operations technician would:

- identify and rectify operational problems
- predict the potential impact of compressor output on the operation of the whole plant
- facilitate output changes.

Generally the operations technician would be part of a team during startup and shutdown operations. They would be expected to be capable of performing all parts of this unit. At all times they would be liaising and communicating with relevant team members.

Prerequisites

This unit **has** the prerequisite of:

- PMAOPS221A Operate and monitor prime movers.

Element	Performance criteria
1. Start up compressor systems/ equipment.	1.1 Perform pre-start-up checks 1.110 Check the status of the system/equipment prior to commencing start-up process 1.111 Check all required auxiliary systems, including oil and water, to confirm their operational condition 1.112 Start up individual items of equipment and the entire compressor system 1.113 Activate and engage switching systems as required, to bring the system/equipment on line safely.

Element	Performance criteria
2. Control and monitor the compressor system.	2.1 Initiate load-up through the selection of appropriate speed or cycle 2.2 Monitor and adjust downstream equipment as required 2.3 Monitor the operational condition and safety status of the unit/system 2.4 Adjust operational speeds and operating cycles as required 2.5 Monitor or activate safety systems to ensure that any system shutdowns are controlled and conducted safely and effectively.
3. Shut down compressor systems/equipment.	3.1 Confirm shutdown cause with other personnel and plant operators before commencing to isolate or shut down the equipment/system 3.2 Implement control measures to minimise damage and hazards 3.3 Shut down system to procedures 3.4 Inspect the system/equipment in order to determine what repair or maintenance may need to be undertaken to return the system/equipment to an on-line condition 3.5 Isolate and purge systems/equipment and prepare for identified repair or maintenance 3.6 Ensure the issued permit to work required to effect this action.
4. Maintain plant effectiveness.	4.1 Frequently and critically monitor all plant throughout shift 4.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant 4.3 Identify critical equipment/processes and tune their performance 4.4 Identify issues likely to impact on plant performance and take appropriate action 4.5 Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people 4.6 Test trips and alarms 4.7 Prepare plant for maintenance/vessel entry as required 4.8 Complete minor maintenance according to procedures.
5. Control hazards.	5.1 Identify hazards in compressor work area 5.2 Assess the risks arising from those hazards 5.3 Implement measures to control those risks in line with procedures and duty of care.

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Element	Performance criteria
6. Resolve problems.	6.1 Identify possible problems in equipment or process 6.2 Determine problems needing action 6.3 Determine possible fault causes 6.4 Rectify problem using appropriate solution within area of responsibility 6.5 Follow through items initiated until final resolution has occurred 6.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the compressor system. For your plant this may include (select relevant items):

- single/multi-stage rotary compressors (axial flow, centrifugal, turbine, screw)
- single/multi-stage reciprocating compressors
- turbo expanders/compressors
- advanced lube and seal oil systems
- intercoolers/heat exchangers
- scrubbers
- instrument/control systems
- programmable logic controllers (PLCs)
- process controllers.

Typical problems for your plant may include:

- surging
- control of temperature and pressure
- variations in feed
- vibration.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 - 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the compressor system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

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Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS221A Operate and monitor prime movers
- PMAOPS223A Operate and monitor valve systems.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- power and torque envelopes
- compression flows and characteristics
- liquid and product separation principles
- plant and field operational requirements
- field and plant geography
- product characteristics and tolerances
- equipment operational parameters
- flow charts
- flow, pressure, temperature, levels and rates.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the compressor system and to distinguish between causes of problems/alarm/fault indications such as:

- process gas variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS305A Operate process control systems

Unit descriptor

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 within its operation. 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.

The operations technician would:

- identify, correct and report operational problems
- be aware of and contribute to a safe working environment
- contribute to the safe and productive operation of the system
- operate, monitor and maintain equipment using relevant procedures
- take appropriate action following an alarm or out of specification condition developing

Generally the operations technician would be part of a team during start up, shut down and normal operating conditions and would be expected to be capable of demonstrating competence in all parts of this unit. He/she would be taking a leading role in liaising and cooperating with other members of the team.

Prerequisites

This unit **has** the prerequisites of at least two relevant OPS200 units or one relevant OPS 300 unit.

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 1.114 Monitor the process using the operator interfaces and keep field operators informed of developments 1.115 Select appropriate controller modes 1.116 Undertake required set point/output changes as required 1.117 Access historical data and information 1.118 Acknowledge messages and alarms.

Element	Performance criteria
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 potential faults 2.3 Interpret alarms and prioritise steps to ensure control of system is maintained 2.4 Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics 2.5 Record process variations/irregularities to procedures.
3. Control process variations and monitor normal operations.	3.1 Use historical data to assist the identification of problems 3.2 Process available information to identify potential faults 3.3 Undertake required set point/output changes to meet plant and process requirements 3.4 Optimise plant operating conditions in accordance with guidelines 3.5 Adjust production in response to test results and control panel information 3.6 Record adjustments and variations to specifications/ schedules and report to appropriate personnel.
4. Facilitate planned and unplanned process start-ups and shut-downs.	4.1 Select and apply procedures to planned startup and shutdown processes 4.2 Select and apply procedures to unplanned shutdown processes 4.3 Communicate with all operational areas and personnel affected by events to ensure that safety of the system and process is maintained during the process 4.4 Implement all required emergency responses and ensure the outcomes of these responses are communicated to all affected areas 4.5 Log all required information for further action to provide a historical record of all events.

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Element	Performance criteria
5. Respond to alarms or out of specification conditions.	5.1 Identify which system is affected by the alarm or out of specification condition 5.2 Examine the condition for signs of severity and check logs for recency of the occurrence 5.3 Identify other alarms or abnormal conditions registered 5.4 Respond to the alarm or incident by following procedures 5.5 Communicate the problem to appropriate personnel 5.6 Record the information on the appropriate log and/or ensure the operations data base is updated with details of the alarm 5.7 Provide details of the alarm and action taken to the next shift at change over 5.8 Follow the incident up see that appropriate action has been taken.
6. Control hazards.	6.1 Identify hazards in the production/processing work area 6.2 Assess the risks arising from those hazards 6.3 Implement measures to control risks in line with procedures and duty of care
7. Resolve problems.	7.1 Identify possible problems in equipment, control systems or process 7.2 Determine problems needing action 7.3 Determine possible fault causes 7.4 Rectify problem using appropriate solution within area of responsibility 7.5 Follow initiated items through until final resolution has occurred 7.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the control system. For your control room this may include (select relevant items):

- process control systems (eg,. distributed control systems)
- personal computers
- printers
- fire and gas detection/protection systems
- emergency shutdown systems
- communications systems.

Typical problems for your plant may include:

- loss of power/utilities
- analysing failure modes
- 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.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 - 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the process control system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responses. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance

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- 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.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, communication and leadership units.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- the architecture and location of the process/production equipment
- specific plant process operations
- product specifications and tolerances
- systems operating parameters
- system integrity limits
- process control philosophies and strategies
- emergency shutdown procedures
- process specific physics, chemistry and mathematics
- process drawings (eg, PID, PFS, cause and effect)
- instrumentation and control systems.

Competence also includes the ability to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies
- product parameters (temperature, flows, pressure and levels)
- process control system malfunction.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	2	2	2

Unit title

PMAOPS307A Transfer bulk fluids into/out of storage facility

Unit descriptor

In a typical scenario involving land based tank farms or tankers at sea, the control room operator, from the main panel, will monitor and control the transfer of product into storage facilities including controlling product levels, flows, temperatures and pressures. The operations technician will also prepare and complete all necessary documentation for the control, transfer and calculation of product volumes.

The storage facility or vessel will be monitored through the use of gas and fire detection equipment. Automatic sprinkler systems or deluges will be activated in the event of fire detection and emergency shutdown systems will operate.

The equipment to be used in the transfer of product will be checked and tested before use. In some cases, before transferring, the circulation of product through pipelines, will commence. This is usually for the purpose of pipeline chilldown, and is required to minimise vapour pressure build-up in warm pipework.

The site may contain the following equipment:

- concrete bunded storage tanks
- atmospheric pressure tanks, floating roof tanks, pressure storage vessels
- temperature controlled tanks (heated, chilled, refrigerated)
- vessels at sea
- transfer and circulation pumps
- stripping pumps
- boil-off gas compressors
- flare system
- instrumentation.

A comprehensive fire water supply main may encompass the facility and/or be located on the vessel, and a suitable fire pump would be able to provide fire water requirements in emergencies.

Safety equipment on site may include

- main fire pumps
- jockey pumps
- fire monitors
- deluge systems
- sub-surface foam injection
- gas detection and reporting systems
- fire detection and reporting systems
- emergency shutdown systems.

Prerequisites

This unit **has** the prerequisites of:

- PMAOPS201A Operate fluid flow equipment OR
- PMAOPS222A Operate and monitor pumping systems and equipment

- PMAOPS223A Operate and monitor valve systems.

Element	Performance criteria
1. Prepare storage/transfer facilities.	1.1 Manage products within the tank farm or at the platform in accordance with the site/enterprise's storage types, products and locations 1.119 Inspect storage or docking facilities for leaks or damage 1.120 Check and test safety systems to verify their operational condition and status, and report on all equipment faults 1.121 Conduct critical inspections of storage and tank farms (and ascertain seaworthiness of vessels at sea if required) ensuring areas are safe, clean and equipment can't be compromised by debris 1.122 Identify and report all equipment requiring maintenance, follow up to satisfactory conclusion.
2. Monitor storage facilities.	2.1 Confirm tank mixes, capacities and quality, and determine if these are being maintained within the agreed product requirements prior to transfer 2.2 Monitor gas detection/environmental/safety systems to ensure the storage area is a safe environment and that the safety of the area or vessel is not compromised 2.3 Communicate storage conditions to transfer or other personnel to inform them of the operational condition and status of the storage facilities or vessel.
3. Monitor load-out/transfer platform or facility as required.	3.1 Monitor load-out/transfer systems on the platform or in the terminal load-out/transfer area 3.2 Monitor gas detection/environmental/safety systems to ensure the load-out/transfer area is a safe environment 3.3 Inform appropriate personnel of the load-out/transfer area's status and conditions of the storage facilities.
4. Conduct load-out/transfer.	4.1 Communicate operational status to required personnel prior to loading 4.2 Ensure that all start-up permissives have been satisfied and product is ready for transfer 4.3 Set and adjust pump flow rates to keep within agreed capacities 4.4 Monitor loading pump performance to keep within stated operational ranges and vibration is in limits 4.5 Take and record product shipping/transfer samples as required.

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Element	Performance criteria
5. Control hazards.	5.1 Identify hazards on platform or in terminal storage work area 5.2 Assess the risks arising from these hazards 5.3 Implement measures to control those risks in line with procedures and duty of care.
6. Resolve problems	6.1 Identify possible problems in equipment and 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 up items until resolved 6.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the load-out and storage system. For your facility this may include (select relevant items):

- tanks
- vessels
- pumps
- compressors
- gauges
- fire protection and deluge systems
- gas detection systems and equipment
- tank dipping and measurement equipment.

Product may include hydrocarbons, oil, gas or bulk liquid chemicals/petrochemicals.

Typical problems for your facility may include:

- insufficient/inappropriate storage for product/material
- interruptions to loading through adverse weather conditions
- product surging
- control of temperature and pressure
- variations in feed
- vibration
- tank capacities and space.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 and 5). Simulation should be based on the actual plant or platform and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS221A Operate and monitor prime movers
- PMAOPS223A Operate and monitor valve systems
- PMAOPS222A Operate and monitor pumping systems and equipment

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- PMAOPS304A Operate and monitor compressor systems and equipment.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

Demonstration of competence in this unit must include knowledge of the following:

- physics of operation
- testing techniques
- equipment isolation and purging
- use and operation of safety equipment, including breathing apparatus
- tank and product mixes
- flow rates and measures
- tank capacities and percentages
- static electricity principles.

Sound knowledge of storage and transfer techniques required to transport oil, gas or water is expected.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title
PMAOPS308A Organise storage and logistics of general materials

Unit descriptor

In a typical scenario, an operations technician organises the storage and logistics of general materials for the plant or work area. Knowledge of the materials, labeling and their storage requirements is applied to the operation of the materials storage and retrieval system. General materials include:

- raw materials and finished goods
- materials in sacks, bags, drums and portable storage containers
- hazardous and dangerous goods.

This unit does NOT apply to the storage and handling of bulk materials, which are covered by *PMAOPS307A Transfer bulk fluids into/out of storage facility* and *PMAOPS309 Operate particulates handling/storage equipment*. Whilst this competency includes the storage and handling of hazardous and dangerous materials, the handling of emergencies is covered by other competencies, for example *PMAHAZ100A Respond to emergency situation*.

The operations technician would:

- determine the storage requirements for materials
- follow requirements of the codes of practice, regulations or statutory requirements in the handling and storage of general materials
- use product and hazard knowledge to contribute to the solving of operational problems to do with the handling and storage of materials.

Generally the operations technician would be part of a team and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Categorise materials.	1.1 Locate storage and handling information for the materials, including hazardous and dangerous goods information, using labels, inventory system or other sources of information 1.123 Interpret storage, handling and hazards information from information sources 1.124 Categorise materials in terms of frequency of use (pick), handling requirements, sources and destination points (internal and external), security requirements, product life and location in the storage area.

Element	Performance criteria
2. Select storage location and method.	2.1 Determine storage location for materials based on hazardous or dangerous goods, composition, state of the materials and containers, temperature or light control, fragility, quantity, size or shape 2.2 Determine storage requirements for new materials based on information available and recommend requirements 2.3 Assist others with advise concerning the storage and handling of materials based on the information available.
3. Store and retrieve materials.	3.1 Determine appropriate transport and handling requirements for materials 3.2 Move materials to and from storage areas, using appropriate handling methods 3.3 Update relevant stock records and documentation as required 3.4 Advise of material stock status, stock-outs or oversupply to relevant personnel 3.5 Contribute to the logistics management process by supply of accurate stock information, movement and advice on storage requirements and capacity.
4. Resolve problems.	4.1 Identify possible problems in equipment or process 4.2 Determine problems needing action 4.3 Determine possible fault causes 4.4 Rectify problem using appropriate solution within area of responsibility 4.5 Follow through items initiated until final resolution has occurred 4.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all types of storage. For your plant this may include (select relevant items):

- bins and binning systems
- racks and racking systems
- marked floor spaces
- pallets, collapsible bins, portable tanks
- specialised storage areas (bunds, secure, weather protected, heated, cooled).

Information in support of storage and handling processes may be from many sources. For your plant this may include (select relevant items):

- goods identification number and codes
- manifests
- picking slips, transfer documents, stock requisitions, batch specifications
- manufacturer's specifications, supplier or customer instructions
- materials safety data sheets (MSDSs)

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- verbal or written communications
- codes of practice, standards, regulations and legislation (including dangerous goods, airfreight, export, import, quarantine, bond or licence requirements)
- quality documentation, procedures.

Typical problems for your plant may include:

- labelling problems (missing, damaged, illegible)
- congestion and lack of appropriate storage area.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, element 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of materials, storages or information needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas and systems are recognised and an appropriate contribution made to their solution.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable

situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Resource implications

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.

Other assessment advice

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 *TDTD1097B Operate a forklift.*

Essential knowledge

Competence includes an understanding of the logistics system, procedures and requirements to the level needed to use the system and recognise and resolve problems. In particular it includes the ability to:

- locate, interpret and apply relevant information
- provide customer service (both internal and external) and work effectively with others
- apply knowledge of regulations and legislation to the storage and handling of materials
- determine material type, location, handling and transport requirements using information sources and systems
- safely move materials to the appropriate areas.

Competence also includes the ability to isolate the causes of problems to a component of logistics system and to distinguish between causes of problems such as:

- missing or damaged labels
- new materials requiring information about storage and handling to be found from additional information sources
- special location requirements for materials.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMAOPS309A Operate particulates handling/storage equipment

Unit descriptor

This competency covers the skills needed to manage a complex storage facility. This requires the operations technician to utilise the storage capacity efficiently, and to ensure particulates are stored in the appropriate containers. The operations technician also needs to monitor the quality and quantity of stock held in each container, and to ensure all containers are free of contamination.

The operations technician would control the conveyor systems transporting particulates into or out of a wide range of storage containers. This means setting up the required routing and starting and stopping conveyors and their feeder systems (if any) to convey materials from one point to another (eg, between storage units, from or into storage). During the process the operations technician would monitor the transfer operations, and take appropriate action to keep particulates moving correctly. This could include removing blockages and preventing rat holing or bridging in hoppers/silos.

The operations technician would also maintain the cleanliness of the facility, along with carrying out minor maintenance according to procedures, and documenting/reporting maintenance requirements and other issues affecting the operation of the facility. At this level, the operations technician would also recognise and solve problems with the transfer or storage processes. This includes recognising indications of potential problems and taking appropriate and timely remedial action to ensure minimal loss of production time.

This competency also covers identifying and controlling hazards related to particulates handling equipment, storage facilities and surrounding areas.

Prerequisites

This unit **has** the following prerequisites.

- PMAOPS210A Operate particulates handling equipment

Element	Performance criteria
1. Prepare storage facilities.	1.1 Identify contents of each container in the facility 1.125 Recognise container types for each product being stored 1.126 Identify leakage and other problems with storage facility 1.127 Confirm safety systems are operational (where required) 1.128 Carry out general housekeeping of facility to remove foreign matter or hazards 1.129 Record and/or communicate identified maintenance requirements.

Element	Performance criteria
2. Operate conveyor systems.	2.1 Identify the type of conveyor/feeder 2.2 Identify the storage container(s) required to supply or store particulates 2.3 Set up routing of conveyor systems to meet requirements 2.4 Start up and shut down conveyor/feeder according to the conveyor type and duty 2.5 Complete routine checks, logs and paperwork, taking action on unexpected observations, readings and trends 2.6 Convey correct material from and to correct location as required.
3. Operate fan/blower if appropriate.	3.1 Identify type of fan/blower 3.2 Start up and shut down fan/blower according to its type and duty 3.3 Monitor critical variables such as amps, temperature or vibration and recognise trends/patterns which indicate a potential or actual problem with the fan/blower.
4. Manage particulates storage facility.	4.1 Monitor quality and quantity of stored solids 4.2 Identify and deal with product contamination 4.3 Transfer stock into, out of or between storage units as required 4.4 Supply customers with correct quality and quantity in a timely manner 4.5 Make effective use of available storage capacity 4.6 Monitor storage facility for actual or potential problems likely to affect the efficient operation of the facility.
5. Carry out maintenance procedures.	5.1 Isolate particulates handling equipment and prepare for maintenance/vessel entry as required 5.2 Complete minor maintenance according to procedures 5.3 Receive plant back from maintenance 5.4 Prepare plant for the introduction of particulates 5.5 Return plant to operation.
6. Control hazards.	6.1 Identify hazards in work area and with equipment 6.2 Assess risks arising from those hazards 6.3 Take appropriate action to control risks in accordance with procedures and duty of care.

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Element	Performance criteria
7. Resolve 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 skill level 7.5 Follow through on initiated items until final resolution 7.6 Report problems outside skill level to designated person.

Range of variables

Context

This competency unit includes items of equipment such as:

- mechanical conveyors/feeders (including belt, vibrating, screw, flight; and feeders such as screw, star, slide, volumetric and weight)
- pneumatic conveyors (including aspects such as dense phase, disperse phase, pressure and vacuum)
- storage facilities (eg, silos and hoppers, also includes purging hoppers).

Typical problems include:

- damage to particulates
- contamination of stored stock
- rat holing and bridging in silos
- routing issues, etc
- vessel capacities.

All operations are performed in accordance with procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 5 and 7). 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

- PMAOPS210A Operate particulates handling equipment
- PMACOM200A Process and record information.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS100A Follow OHS procedures.

Essential knowledge

Competence includes an understanding of the particulates handling system and its integral equipment, and also of the storage facility to a level needed to control the handling system and storage facility, and to recognise and resolve problems. In particular it includes the ability to:

- identify all items of the particulates handling system and describe the function of each
- identify the location of all storage units in the facility and their contents

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- describe the causes and remedies of common problems such as those selected in the range of variables.

It also requires a knowledge of:

- particulate properties
- logistics
- forward demand
- material storage requirements
- compatibility and contamination issues

Competence also includes the ability to distinguish between:

- grade and specification of materials
- types and causes of conveyor or storage problems to a level that allows problems to be isolated to an item of equipment.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	2	2	1	2	2

Unit title

PMAOPS312A Undertake ship loading/unloading operations

Unit descriptor

In a typical scenario, the operations technician is responsible for the custody transfer of materials/products from the loading area to vessels or from vessels to storage areas. The operations technician will report the state of readiness of the loading facilities before starting transfer to the loading master and to the terminal operator. Loading areas can include:

- terminal facilities
- jetties
- production platforms
- FPSOs/FSOs.

The operations technician will control the cargo transfer rate within safe limits, which are agreed between the ship and/or the terminal prior to commencing transfer. Jetty and platform operators will observe the mooring and direct the positioning of ships in order to facilitate the safe connection and operation of loading arms and gantries. The operations technician will complete all necessary documentation for the control and calculation of product volumes. This unit applies to products such as LNG, LPG, oil and chemicals.

Generally the operations technician would be part of a team during loading activities and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has** the following prerequisites.

- PMAOPS223A Operate and monitor valve systems **OR**
- PMAOPS222A Operate and monitor pumping systems and equipment.

Element	Performance criteria
1. Prepare for ship transfer (unloading/loading) of product.	1.1 Check to ensure that the vessel is ready for product transfer (including secured and properly moored) before starting transfer 1.130 Activate/bring on line all safety systems (eg, deluge, fire protection) as required to protect the vessel and personnel during product transfer 1.131 Ensure all operational conditions for transfer of product are satisfied (eg, connect and initiate loading pumps and arms/hoses) 1.132 Ensure safety check documentation is completed.

Element	Performance criteria
2. Transfer product to/from ship.	2.1 Check transfer advice/documentation and complete required records 2.2 Engage fire and deluge protection systems as required 2.3 Launch and retrieve batching pigs as required 2.4 Start pumps to commence the transfer process of the specified product 2.5 Control and monitor transfer rates to ensure the product is transferred safely and within the defined storage capacities 2.6 Monitor the progress of the transfer and tank levels and liaise as appropriate 2.7 Identify vapour or product leakages/spills and take corrective action to minimise the risk of significant loss of product and damage to the local environment 2.8 Apply emergency procedures as required.
3. Complete transfer process.	3.1 Achieve or satisfy capacities and transfer requirements within the allowable timeframes and schedules 3.2 Retrieve batching pigs as required 3.3 Decommission, isolate and disengage transfer pumps and arms/hoses from or to the vessel as required 3.4 Continue to monitor and control fire, deluge and safety systems during the finalisation of the loading process and let-go of the vessel as required 3.5 Complete all required logs and documentation and communicate the results of the transfer to the appropriate personnel 3.6 Shut down and bring transfer facilities off line, ensuring that the area has been made safe after the transfer has been completed.
4. Control hazards.	4.1 Identify hazards in terminal and ship transfers 4.2 Assess the risks arising from these hazards 4.3 Implement measures to control those risks in line with procedures and duty of care.
5. Resolve problems.	5.1 Identify possible problems in equipment and process 5.2 Determine problems needing action 5.3 Determine possible fault causes 5.4 Rectify problem using appropriate solution within area of responsibility 5.5 Follow items up until resolved 5.6 Report problems outside area of responsibility to designated person.

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Range of variables

Context

This unit of competency includes all items of equipment and unit operations which form part of the ship loading/unloading system. For your plant this may include (select relevant items):

- loading pumps
- loading arms
- gantries
- fire extinguishers, hoses and jets
- gas and other hazard monitoring systems
- mooring lines
- compressors
- storage tanks
- pipelines and trunklines
- pig launcher, pig trap, batching pigs
- measurement systems.

Typical problems for your plant may include:

- surging
- control of temperature and pressure
- variations in feed
- product leakage.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, element 1). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of ship loading and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS221A Operate and monitor prime movers
- PMAOPS222A Operate and monitor pumping systems and equipment.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- all items on a schematic of the ship loading/unloading system and the function of each
- the nature/condition of materials being transferred to and from the vessel and the factors to be considered in the transfer operation
- causes and remedies of common problems such as those selected in the range of variables
- effects of temperature and pressure in transfer operations
- storage and product transfer techniques and mediums.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the compressor system and distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/wrong reading
- electrical failure
- mechanical failure

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- operational problems
- metering problems
- spills/leaks
- meteorological events.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS320A Conduct artificial lift

Unit descriptor

In a typical scenario, an operations technician is responsible for controlling the artificial lift of fluids from operating wells either on land or off-shore using pumps, valves and compressors. The operations technician is also responsible for conducting tests and analyses of the product and the operating condition of the equipment. Fluids lifted by the process can include:

- oil
- condensate
- water.

The operations technician would:

- identify and rectify operational problems
- monitor production
- conduct tests
- facilitate output changes.

Generally the operations technician would be part of a team during startup and shutdown procedures and may be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Produce product.	1.1 Operate lifting process in accordance with local lease and lease equipment requirements and constraints 1.133 Operate pumps, valves and other production equipment to transfer product/fluid from well to surface 1.134 Test production equipment to ensure correct operating efficiencies are maintained 1.135 Monitor valves, pumps and other production equipment to determine any operational faults and repairs required during the production phase 1.136 Diagnose operational faults during the production phase.
2. Monitor product/volume efficiencies.	2.1 Select and operate the required testing equipment 2.2 Test and analyse product flow temperatures and pressures and determine fluid volumes to evaluate the production efficiencies of the well 2.3 Monitor and observe equipment operating condition, pressures and temperatures to maintain correct operating parameters of the equipment.

Element	Performance criteria
3. Transfer product to storage.	3.1 Maintain records and reports to provide a history of the production capacities of the well and any deviations which have occurred 3.2 Communicate transfer of the product to all appropriate support groups and work groups downstream of the well 3.3 Select an appropriate medium for safe transfer of the product to the next phase in the product process 3.4 Observe and act upon all environmental conditions and legislative requirements to ensure the protection of the working environment is maintained during product transfer.
4. Control hazards.	4.1 Identify hazards in the wellhead 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. Resolve problems.	5.1 Identify possible problems in equipment or process 5.2 Determine problems needing action 5.3 Determine possible fault causes 5.4 Rectify problem using appropriate solution within area of responsibility 5.5 Follow items initiated through until final resolution has occurred 5.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the wellhead system. For your plant this may include (select relevant items):

- gas lifts
- down hole pumps.

Typical problems for your plant may include:

- gassing up
- solids control
- gas lift valve erosion
- mechanical failures
- electrical and instrument failures.

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.

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Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of artificial lift systems and their integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

As a general rule assessment will require access to an operating artificial lift system over an extended period of time, or a suitable method of gathering evidence of operating competence over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

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Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS221A Operate and monitor prime movers
- PMAOPS222A Operate and monitor pumping systems and equipment
- PMAOPS223A Operate and monitor valve systems
- PMCSUP292A Sample and test materials.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- methods of down hole installation of equipment
- well bore hydraulics
- reservoir formation
- local knowledge concerning the well's operations
- principles of well operation
- pumping/compressor efficiencies, production volumes and product capacities.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the system and to be able to distinguish between causes of problems/ alarm/fault indications such as:

- lift gas variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	2

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Unit title

PMAOPS321A Undertake well management

Unit descriptor

In a typical scenario an operations technician operates, monitors and manages wells and ancillary equipment. The activity includes operating and monitoring the performance of well equipment, making adjustments to and reporting on product flows, identifying and reporting operational problems, being aware of and contributing to a safe working environment, and the safe and productive operation of the system.

Well systems can include:

- onshore and offshore production facilities
- oil or gas production sites.

Generally the operations technician would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has** the prerequisites of:

- PMAOPS223 Operate and monitor valve systems **OR**
- PMAOPS201A Operate fluid flow equipment **OR**
- PMAOPS222A Operate and monitor pumping systems and equipment

Element	Performance criteria
1. Produce oil and gas.	1.1 Operate valves to control and direct flows to meet demand requirements 1.137 Utilise process control instrumentation to produce oil/gas 1.138 Liaise with other services and contractors during the production phase 1.139 Collect, interpret, correlate and report or communicate selected data.
2. Conduct flow measurement.	2.1 Apply appropriate mathematical formulae and formats to determine product volumes 2.2 Collect and utilise appropriate production data to determine product flows 2.3 Analyse historical data and records to monitor and determine well performance 2.4 Calculate production figures and targets, and apply this data to all functions related to this competency.

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Element	Performance criteria
3. Maintain well and associated production equipment.	3.1 Monitor operational condition and efficiencies of equipment 3.2 Implement corrosion control procedures for all equipment to maintain its operating integrity 3.3 Conduct inspections of instrumentation equipment and rectify faults where possible or report to appropriate person or service group 3.4 Liaise with maintenance operations to determine and prioritise any required maintenance.
4. Handle product transfer.	4.1 Separate products into their respective product groupings 4.2 Treat all excess separation process waste water, utilising the appropriate chemical and disposal techniques 4.3 Transfer product to appropriate location for future processing or sale 4.4 Maintain all well logs and records as required.
5. Prepare equipment for maintenance.	5.1 Isolate equipment identified for maintenance ensuring that equipment is drained, depressured, purged, flushed and made safe to work on, according to procedures 5.2 Perform appropriate gas sampling or testing as required. 5.3 Check equipment is prepared to work permit conditions 5.4 Prepare well for intervention work.
6. Control hazards.	6.1 Identify hazards in the production/processing work area 6.2 Assess the risks arising from those hazards 6.3 Implement measures to control those risks in line with procedures and duty of care.
7. Resolve 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 items initiated through until final resolution has occurred 7.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. For your plant this may include (select relevant items):

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- valves including non-return valves
- pumps
- prime movers
- product separation units
- instrumentation
- testing equipment
- hydraulic power units.

Typical problems for your plant may include:

- leakage
- vibration
- loss of control of pressure and/or flow
- hydrates/blockages
- liquid slugging
- corrosion
- scale formation
- erosion.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, element 2). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in well operation and the equipment integral to its use, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

Assessment will require access to an operating well over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with

- PMAOPS320 Conduct artificial lift.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- well design and construction
- fluid dynamics and statics
- natural gas and oil characteristics
- reservoir management and characteristics
- static electricity principles
- flange, pressure and temperature ratings
- corrosion control and chemical handling
- environmental aspects and conditions
- hydrate formation.

Competence also includes the ability to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure malfunction
- electrical failure malfunction
- mechanical failure malfunction
- equipment design deficiencies
- change in product parameters (temperature, flows, pressure and levels)
- fouling or contamination
- corrosion
- quality measurement inaccuracy (eg, from analyser or manual sampling deficiencies).

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Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	2	2	2

Unit title

PMAOPS325A Generate electrical power

Unit descriptor

In a typical scenario an operations technician operates, monitors, starts up and shuts down power generation systems and ancillary equipment. This unit includes operating and monitoring the performance of the power generation plant and making appropriate changes to meet power demand. This includes a full understanding of the process and all OHS requirements including emergency situations.

The operations technician would:

- identify, correct and report operational problems
- be aware of and contribute to a safe working environment
- contribute to the safe and productive operation of the system
- operate, monitor and maintain equipment using relevant procedures.

Generally the operations technician would be part of a team during start up, shut down and normal operating conditions. However they would be expected to be capable of demonstrating competence in all parts of this unit. They would be taking a leading role in liaising and cooperating with other members of the team.

Prerequisites

This unit **has** the prerequisite of:

- PMAOPS221A Operate and monitor prime movers.

Element	Performance criteria
1. Prepare for power generation.	1.1 Communicate startup of power generation to all required personnel 1.140 Select the prime mover to be used 1.141 Select system for the generation process appropriate to voltage systems and requirements 1.142 Conduct pre-start-up checks as required 1.143 Start the prime mover for the generation system to procedures 1.144 Synchronise all equipment to transfer the power safely into the system.
2. Operate generation equipment.	2.1 Balance loads and power factors 2.2 Monitor and adjust loads as required to ensure that all machine loads are maintained within safe working conditions 2.3 Distribute energy to the generation system in a safe and efficient manner, ensuring that the status of all equipment is monitored as required 2.4 Rebalance loads as required so as to maximise production efficiency 2.5 Maintain logs to record all systems data and identify all deviations or problems encountered.

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Element	Performance criteria
3. Shut down process.	3.1 Communicate shutdown of process to all required personnel 3.2 Systematically shed loads, shut down generators as required during the shutdown process 3.3 Isolate all required equipment from the bus in accordance with procedures 3.4 Return the system to a balanced operating condition after shutting down selected generator(s).
4. Control hazards.	4.1 Identify hazards in the production/.processing 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. Resolve problems.	5.1 Identify possible problems in equipment or process 5.2 Determine problems needing action 5.3 Determine possible fault causes 5.4 Rectify problem using appropriate solution within area of responsibility 5.5 Follow through items initiated until final resolution has occurred 5.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. For your power generation system this may include (select relevant items):

- high voltage and low voltage AC and DC
- battery systems
- uninterrupted power supplies (UPS)
- switchboards
- prime movers
- transformers
- unit control panels
- electrical protection equipment.

Typical problems for your plant may include:

- variation/loss of fuel/energy supply
- control equipment failure
- power demand changes
- change in atmospheric conditions (rain, temperature, wind, lightning)
- emergency situations.

HSE

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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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 - 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the electrical generation system and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

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Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS221A Operate and monitor prime movers.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- cathodic protection techniques
- switching techniques
- isolation procedures
- earthing techniques
- voltage systems
- electrical generation and distribution theory
- theory of synchronisation
- hazards associated with chemical substances such as PCBs.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the system and to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure malfunction
- electrical failure malfunction
- mechanical failure malfunction
- equipment design deficiencies
- changes in fuel quality.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMAOPS326A Produce product using gas absorption

Unit descriptor

In a typical scenario an operations technician operates and monitors gas absorption units and ancillary equipment such as glycol dehydration or CO_2 absorption units. In this role the operations technician would:

- identify and report operational problems
- be aware of and contribute to a safe working environment
- contribute to the safe and productive operation of the system
- operate, monitor and maintain equipment using relevant procedures.

Generally the operations technician would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

Prerequisites

-
- This unit **has no** prerequisites.

Element	Performance criteria
1. . Start up absorption system.	1.1 Check the operational condition of all required process equipment to ensure that it is ready for startup 1.145 Bring absorption systems on line, ensuring all equipment is correctly lined up to procedures 1.146 Monitor absorption process ensuring the plant is operating safely and efficiently.
2. Undertake gas absorption.	2.1 Operate the process equipment, ensuring that all required valves, systems and equipment are lined up to ensure steady operating conditions 2.2 Select the appropriate medium for the stripping and rectification of the product 2.3 Recover all hydrocarbons from the medium by skimming as necessary 2.4 Monitor vapour pressures to ensure that product remains on specification 2.5 Top up and drain medium used in the process as required to maintain operating levels 2.6 Maintain liaison with required personnel.

Element	Performance criteria
3. Record process variations and communicate problems.	3.1 Record any product variations and note the type of variation and action taken to rectify the variation 3.2 Record actions as a reference and for any further investigation 3.3 Arrange maintenance of operational equipment as required and communicate to appropriate personnel 3.4 Isolate identified operational equipment requiring maintenance from the process and purge in accordance with procedures to rectify the problem.
4. Control hazards.	4.1 Identify hazards in the production/processing 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. Resolve problems.	5.1 Identify possible problems in equipment or process 5.2 Determine problems needing action 5.3 Determine possible fault causes 5.4 Rectify problem using appropriate solution within area of responsibility 5.5 Follow through items initiated until final resolution has occurred 5.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. For your plant this may include (select relevant items):

- heat exchangers, coolers and cooling systems
- turbines, including LSO, relay oil and governing
- pumps and filters
- valves
- regeneration or top-up systems
- columns, towers
- vessels.

Typical problems for your plant may include:

- variation/loss of feed
- unstable control of pressure, temperature level and flows
- control equipment failure
- process plant trips
- change in atmospheric conditions (rain, temperature, wind, lightning)
- medium contamination (acidic - pH, solids, water content, hydrocarbon content)
- poor regeneration (flow/heat/cooling)
- analyser inaccuracy/malfunction.

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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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1, 3 and 4). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of gas absorption equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

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Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS221A Operate and monitor prime movers
- PMAOPS222A Operate and monitor pumping systems and equipment
- PMAOPS223A Operate and monitor valve systems.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- principles of operation of the absorber
- product tolerances and specifications
- systems operating parameters
- process control philosophies and strategies
- outside process/production operational knowledge, including column operation, furnaces and trays
- extraction principles
- industry entry level physics and chemistry
- hydrate formation.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the compressor system and to distinguish between causes of problems/alarm/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies
- product parameters (temperature, flows, pressure and levels)
- fouling or contamination
- corrosion
- quality measurement inaccuracy (eg, from analyzer or manual sampling deficiencies).

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMAOPS327A Produce product using fixed bed dehydration

Unit descriptor

In a typical scenario an operations technician operates and monitors fixed bed dehydration units and ancillary equipment. This also includes the operations technician identifying and reporting operational problems, being aware of and contributing to a safe working environment, contributing to the safe and productive operation of the system, and operating, monitoring and maintaining the equipment using relevant procedures.

Generally the operations technician would be part of a team during start up and shut down procedures and would be expected to be capable of demonstrating competence in all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT apply to glycol dehydration systems see *PMAOPS326A Produce product using gas absorption*

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Start up dehydration system.	1.1 Check all required equipment is ready for startup 1.147 Start up dehydration systems and bring on line, ensuring all equipment is correctly lined up to procedures 1.148 Monitor dehydration process, ensuring the plant is operating safely and efficiently.
2. Undertake dehydration of product.	2.1 Apply knowledge of hydride formation, absorption and/or adsorption process theories to facilitate safe operation of the process 2.2 Adjust operating parameters and process conditions during dehydration in order to keep product moisture within specification 2.3 Ensure that heating and cooling times during the dehydration and regeneration process are such that the product remains on specification 2.4 Maintain liaison with required personnel throughout the process 2.5 Resequence process equipment as required to achieve and maintain required operating criteria.

Element	Performance criteria
3. Record process variations and communicate problems.	3.1 Record any product variations, noting the type of variation and action taken to rectify the variation 3.2 Record actions as a reference and for any further investigation 3.3 Arrange maintenance of operational equipment as required and communicate to appropriate personnel 3.4 Isolate identified operational equipment requiring maintenance from the process and purge in accordance with procedures to rectify the problem.
4. Control hazards.	4.1 Identify hazards in the production/processing 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. Resolve problems	5.1 Identify possible problems in equipment or process 5.2 Determine problems needing action 5.3 Determine possible fault causes 5.4 Rectify problem using appropriate solution within area of responsibility 5.5 Follow items initiated through until final resolution has occurred 5.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the production/processing system. For your plant this may include (select relevant items):

- vessels
- valves
- compressors
- piping systems
- exchangers
- furnaces
- columns and towers
- cooling and heating systems
- burner management systems
- programmable logic controllers (PLCs)
- filters
- analysers.

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Typical problems for your plant may include:

- variation/loss of feed
- unstable control of pressure, temperature level and flows
- control equipment failure
- process plant trips
- change in atmospheric conditions (rain, temperature, wind, lightning)
- emergency situations
- desiccant contamination
- desiccant damage/bed collapse (overpressuring)
- poor regeneration (flow/heat/cooling).

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 to 4). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of dehydration and integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined

- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS223 Operate and monitor valve systems.
- PMAOPS304 Operate and monitor compressor systems and equipment.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- Principles of operation of dehydrator
- product tolerances and specifications
- systems operating parameters
- process control philosophies and strategies
- outside process/production operational knowledge, including columns, furnaces, waste heat recovery and trays
- extraction principles
- other process equipment, including valves
- basic level physics and chemistry
- hydrate formation
- adsorption/desorption
- alarm systems.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the dehydration system and to distinguish between causes of problems/alarms/fault indications such as:

- instrument failure/malfunction
- electrical failure/malfunction
- mechanical failure/malfunction
- equipment design deficiencies
- product parameters (temperature, flows, pressure and levels)
- fouling or contamination
- corrosion
- quality measurement inaccuracy (eg, from analyser or manual sampling deficiencies)

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Key competencies

1 Collect, analyse and organise information	2 Communicate ideas and information	3 Plan and organise activities	4 Work with others and in teams	5 Use mathematical ideas and techniques	6 Solve problems	7 Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS329A Produce product using liquid extraction

Unit descriptor

A typical example of liquid extraction occurs in a natural gas processing plant and contains an absorber, de-ethaniser tower, turbo expander compressor, cold separator vessel and various plate fin type heat exchangers. An operations technician would be monitoring and controlling this process in order to achieve condensation of all the desired product to meet a predetermined specification.

The turbo expander and absorber tower can be considered to be the heart and lungs of the unit. Cryogenic absorbers may be trayed or packed and will be designed to provide sufficient vapour liquid contact to achieve the required overheads and bottoms product specification.

The operations technician will be able to:

- identify and correct operational problems
- determine the impact of composition changes
- liaise with maintenance to schedule equipment availability.

This competency would be undertaken within a team environment and in conjunction with the overall control of the product being produced.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Bring system on line.	1.1 Bring process equipment into operational condition, ensuring that all trays, columns and heat exchangers are operating within their specified parameters 1.149 Make ready liquid extraction systems and related equipment and bring on line during start-up 1.150 Apply a knowledge of turbo expander and Joule Thomson theories and principles to the safe operation of the system.
2. Monitor liquid extraction process.	2.1 Monitor the product variables, ensuring they stay within specification 2.2 Check process equipment, including pumps, compressors and heat exchangers, and keep within operating parameters 2.3 Adjust equipment as required 2.4 Identify cryogenic products and any other hazards to determine what safety requirements may be necessary 2.5 Transfer product to the next stage of the production process.

Element	Performance criteria
3. Record product and equipment deviations.	3.1 Log unit details updating information on an ongoing basis 3.2 Identify required maintenance of equipment and communicate to appropriate personnel 3.3 Isolate, purge and depressurise equipment identified for maintenance work 3.4 Hand over equipment to maintenance when safe to do so 3.5 Ensure work is completed within the constraints of the issued work permit.
4. Control hazards.	4.1 Identify hazards in a liquid extraction unit area 4.2 Assess the risk arising from these hazards 4.3 Implement control measures for these risks in line with procedures and duty of care.
5. Resolve problems.	5.1 Identify problems needing action 5.2 Determine possible fault causes 5.3 Solve unit problems in area of responsibility 5.4 Follow up items until resolved 5.5 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the liquid extraction system system. For your plant this may include (select relevant items):

- absorber tower
- expanders/compressors
- lube oil system
- instrumentation
- cold separator
- pumps
- fans
- refrigeration systems or cryogenic systems.

Typical problems for your plant may include:

- design temperature constraints
- CO_2 freezing
- Flooding.

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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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 to 3). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the liquid extraction and integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

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Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAOPS304A Operate and monitor compressor systems and equipment
- PMAOPS205A Operate heat exchangers.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- principles of operation of liquid extractors
- product tolerances, limitations and specifications
- systems operating parameters
- basic level physics and chemistry
- process control philosophies and strategies
- stabilisation principles
- the basis of cryogenic operations.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the liquid extraction system and to distinguish between causes of problems/alarms/fault indications such as:

- process gas variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure.

Key Competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMAOPS330A Communicate, and monitor pipeline activities

Unit descriptor

In this scenario operations technicians maintain a watching brief over the pipeline from the pipeline control centre. The centre will be the hub for pipeline activities in order to achieve minimum risk to continued safe and efficient operation of the pipeline system. The pipeline control centre operations technician will communicate with field personnel to obtain information and direct field operators to check and maintain pipeline operations.

The operations technician will:

- ensure the safety of the system and check operational equipment prior to start up
- maintain productivity through the monitoring of flows, pressures and temperatures in the field
- maintain communication with product suppliers and user customers to maintain the safe and efficient operation of the pipeline.

Generally the pipeline control centre operations technician would be part of a team during pipeline startup and shutdown procedures. However, they will be expected to be capable of performing all parts of this unit on their own. At all times they would be liaising and cooperating with other members of the team and customers.

AS 2885 Part 3 forms the principle reference standard for this competency.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Gather information about pipeline operation needs.	1.1 Respond to and record messages and information received from field operations and pipeline system stations 1.2 Interpret and acknowledge alarm codes correctly to ensure the correct response strategy is selected and applied to the situation 1.3 Clarify additional information needs and select an appropriate communication medium to deliver the information required 1.4 Improve operational efficiency through adequate and timely application of information provided 1.5 Interpret and action customer/shipper gas forecasts to ensure correct gas flow rates into the pipeline system are achieved.

Element	Performance criteria
2. Communicate pipeline information.	2.1 Monitor activities of pipeline personnel in the field and data from the control center 2.2 Evaluate internal messages and response communications concerning system alarms/incidents to establish the scope and severity of the alarm/ incident 2.3 Convey pipeline system operation information to relevant personnel in other work areas to ensure safe and efficient operation of the pipeline system 2.4 Relay information to technicians and other services/parties so that fault finding or safety checks can be conducted to identify risks to product supply, pipeline equipment, environment and personnel 2.5 Authorise, record and monitor permits to work to allow operational activities to be undertaken or cancelled.
3. Coordinate pipeline systems operations.	3.1 Monitor field and pipeline station operations data 3.2 Monitor and observe equipment operating conditions, pressures and temperatures, and maintain correct equipment operating parameters 3.3 Identify faults and initiate the required repair or reporting of the fault 3.4 Isolate identified faults in the pipeline as appropriate 3.5 Respond to system alarms and emergencies 3.6 Determine the required course of action or emergency response to the identified system condition/ emergency 3.7 Complete and document pre-shutdown checks 3.8 Shut down the pipeline system under either normal or emergency conditions in accordance with operating procedures 3.9 Confirm all identified maintenance is in compliance with the permit to work system and administer to ensure that all work complies with all issued permits.
4. Record and report.	4.1 Record and monitor field personnel movements to ensure the safety of all personnel in the field 4.2 Report safety and environmental risks or faulty equipment to designated personnel for further action or advice concerning the selection of the appropriate response or course of action 4.3 Interpret and maintain field inspection records and reports 4.4 Complete operations and production reports 4.5 Perform shift handover procedures.
5. Control hazards.	5.1 Identify hazards in work area 5.2 Assess the risks arising from those hazards 5.3 Implement measures to control those risks in line with procedures and duty of care.

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Element	Performance criteria
6. Resolve problems.	6.1 Identify possible problems in equipment or process 6.2 Determine problems needing action 6.3 Determine possible fault causes 6.4 Rectify problem using appropriate solution within area of responsibility 6.5 Follow items initiated up until final resolution has occurred 6.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the pipeline control system. For your organisation this may include (select relevant items):

- radio communications equipment, email, fax and telephones
- heaters, furnaces and exchangers
- station instrumentation/metering equipment
- condition monitoring equipment
- process control equipment
- gas quality and analysis equipment
- valves, actuators and flanges
- piping systems
- pressure vessels/filtration equipment
- compressors and prime movers
- cathodic protection systems.

Typical problems for your plant may include:

- communications disruptions
- corrosion/hydrate formation
- variations in flow temperature and/or pressure
- failures of piping, valves or flanges
- pipeline leakages.

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

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 to 4). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the use of the systems in the pipeline control centre and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMAPER201B Monitor and control work permits
- PMAOPS230A Monitor, operate, and maintain pipeline stations and equipment.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- communications systems

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- pipeline system functions within the design parameters and design philosophy
- process information schemata of the pipeline system and associated facilities
- pipeline operating principles, parameters and product specifications
- relevant workplace documentation
- SCADA systems
- alarm systems and emergency systems, including fire and shutdown
- plant communication systems, including radio, faxes and telephone
- the 'permit to work' system
- architecture of the pipeline system
- pipeline system operating parameters
- gas quality/analysis equipment operation
- MSDS information.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the compressor system and distinguish between causes of problems/alarm/fault indications such as:

- pipeline pressure variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problems.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	2	2	2

Unit title

PMAOPS340A Operate cryogenic processes

Unit descriptor

This competency covers the skills needed to operate and maintain complex refrigeration/cryogenic systems that involve multi-stage centrifugal compressors (or similar) and associated equipment, including computer control and monitoring systems.

It does NOT cover small packaged refrigeration systems, which are covered by *PMAOPS100A Operate equipment to procedures*.

In this competency the operations technician would have a good understanding of the principles of refrigeration systems to a level that allows the operations technician to make adjustments to the system to achieve the required level of performance. The operations technician would typically understand:

- different types of refrigerants and the relationship between vapour pressure and temperature
- operating principles of each component of a large refrigeration system
- methods of controlling refrigerant temperature
- the objectives of refrigeration control.

In a typical application, the operations technician would monitor the operation of the refrigeration system and:

- make adjustments at the control panel/computer system to maintain the required operating parameters
- carry out minor maintenance in accordance with procedures
- identify situations requiring maintenance or repair outside the operator's skill level.

The operations technician would also be responsible for starting up and shutting down the system, and making relevant checks on all parts of the system, including safety systems. In particular, the operations technician would identify hazardous situations arising from a malfunction of the system and take appropriate timely remedial action. At this level, the operations technician would also recognise and solve problems with the refrigeration system. This includes recognising indications of potential problems and taking appropriate and timely remedial action to ensure minimal loss of production time.

This competency also covers identifying and controlling hazards related to large refrigeration systems.

Prerequisites

This unit **has** the prerequisites of:

- PMAOPS205A Operate heat exchangers
- PMAOPS221A Operate and monitor prime movers.

Element	Performance criteria
1. Start up and shut down refrigeration system.	1.1 Carry out pre-start up checks of all items of the system, including safety systems 1.151 Start-up to procedures 1.152 Monitor the start-up process and make adjustments as required to ensure operating parameters are achieved 1.153 Carry out general housekeeping of the system to procedures 1.154 Shut down to procedures 1.155 Perform emergency shut down of equipment (if required) 1.156 Record and/or communicate relevant information (if required).
2. Monitor and control refrigeration system.	2.1 Complete routine checks, logs and paperwork, taking action on unexpected observations, readings and trends 2.2 Recognise indications of actual or potential problems and take appropriate action to minimise the impact of problems on production time, safety, health and the environment 2.3 Recognise conditions likely to give rise to brittle fracture and take appropriate action 2.4 Identify critical exposure temperature (CET) and take action to minimise its impact 2.5 Monitor critical variables throughout the system and take appropriate action to maintain system operation 2.6 Make adjustments to maximise plant efficiency 2.7 Predict the need to make a change to meet process requirements 2.8 Make changes as required in a smooth and timely manner 2.9 Predict and communicate the impact on other parts of the plant that are reliant on the refrigeration system.
3. Resolve refrigeration problems.	3.1 Identify problems needing action 3.2 Determine possible fault causes 3.3 Rectify problems using appropriate solution in area of responsibility 3.4 Follow items initiated up until resolved 3.5 Report problems outside area of responsibility to designated person.
4. Carry out maintenance procedures.	4.1 Isolate refrigeration system and prepare for maintenance as required 4.2 Complete minor maintenance according to procedures and manufacturer's specifications 4.3 Receive plant back from maintenance 4.4 Prepare plant for operation 4.5 Return plant to operation.

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Element	Performance criteria
5. Control hazards.	5.1 Identify hazards in work area and with equipment 5.2 Assess risks arising from those hazards 5.3 Take appropriate action to control risks in accordance with procedures and duty of care.

Range of variables

Context

This competency unit includes items of equipment such as:

- large refrigeration systems that produce low temperatures
- multi-stage centrifugal compressors
- heat exchangers

Typical problems include:

- maintaining required operating temperatures
- recognising and acting upon unstable/sub-optimal operation (eg, icing, moisture, fouling)
- controlling critical variables and outputs.

All operations are performed in accordance with procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, parts of 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.

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.

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Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. For many plants, it might be appropriate for this unit to be assessed with:

- PMAOPS304A Operate and monitor compressor systems and equipment.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200A Participate in workplace safety procedures.

Essential knowledge

Competence includes a comprehensive understanding of the role of the refrigeration system and its integral equipment in the overall operation of the plant. In particular it includes the ability to:

- identify and describe the function of all items of the refrigeration system
- describe the causes and remedies of common problems such as those selected in the range of variables.

Competence includes a comprehensive understanding of the principles of refrigeration such as:

- block diagram of a refrigeration system
- basic principles of refrigeration
- types of industrial refrigerants and their applications
- the use of ‘self refrigerants’ (ie, the process fluid, such as ethylene or propylene, is also the refrigerant)

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- methods of controlling refrigeration systems (eg, pressure regulation)
- factors affecting performance.

It also requires a knowledge of:

- principles of operation of each item of equipment (eg, heat exchangers, compressors, condensers, vaporisers, refrigerant drains, valves)
- physics of operation
- brittle fracture, stress limits and the affects of thermal shock on materials of construction
- vapourisation, condensation and impact on process
- good operating practices
- contamination issues
- methods of resolving problems
- HAZCHEM symbols and codes.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	2

Unit title

PMAOPS350A Match and adjust colour

Unit descriptor

This unit covers the use of colour matching samples in comparing the colour of a product to the standard and then recommending adjustments to be made to bring the colour into the acceptable range.

In a typical scenario, a technician prepares a colour sample, compares it to the standard and then recommends adjustments (if required) in order to bring the product's colour within the acceptable range. This may be done using a 'colour computer' or by eye. The adjustments would be by making additions to the batch to bring it into range without overshooting. The 'standard' might be for a product being manufactured or for a new product being developed.

The ability to recommend adjustments is the critical element of this unit as this requires a significant understanding of colour.

The technician would:

- prepare a colour sample
- analyse the colour sample and compare it to the standard
- recommend adjustments to bring the batch into colour specification.

Generally the technician would work alone while colour matching, but must be capable of communicating effectively with the relevant operating personnel.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Prepare colour sample.	1.1 Identify required sample properties 1.157 Select appropriate sample preparation method 1.158 Identify required sample preparation conditions 1.159 Adjust and control sample preparation conditions 1.160 Prepare colour sample.
2. Compare colour sample to standard.	2.1 Identify light conditions for comparison 2.2 Compare colour sample to standard using 'colour computer' as required 2.3 Compare colour sample to standard by eye as required 2.4 Reconcile data from each comparison if appropriate.
3. Recommend adjustments to batch.	3.1 Estimate the colourant additions needed to bring batch to standard 3.2 Recommend additions to relevant personnel as appropriate 3.3 Recommend additional mixing/processing requirements to procedure 3.4 Repeat sample preparation, colour matching and adjustment until correct colour is obtained.

Range of variables

Context

This unit of competency includes the use of items of equipment required for colour sample preparation and colour matching.

Sample properties may include:

- surface finish
- gloss
- thickness
- opacity
- substrate properties.

Sample preparation methods may include:

- draw down
- spraying
- brushing.
- moulding
- casting
- milling
- pressing.

Sample preparation conditions may include:

- temperature
- drying rate
- time
- pressure
- volume.

Colourants may include:

- pigments
- masterbatches
- tinters.

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.

Evidence guide

Assessment context and methods

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

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Simulation may be used. 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- estimates of required adjustments are consistent with the colour match data
- adjustments are made cautiously and without overshooting
- adjustments are made efficiently with a minimum number of adjustments to bring the batch into specification.

These aspects may be assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response.

These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Competence includes an understanding of colour and how the pigments used interact with the process to develop the required colour in the final product. In particular it includes the ability to:

- recognise hue, value and chroma (or colour/tone, lightness/shade and saturation) differences
- describe the effect of a change of light conditions on the appearance of the colour for the pigment combination used as relevant to the product
- recognise colourant addition and colourant dispersion differences
- make judgements based on
    - perceptibility
    - acceptability/tolerance
    - grade 1, 2 or 3 match as required by specification
- describe the impact of opacity on colour as relevant to the product

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	2

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Unit title

PMAOPS390A Operate a biochemical process

Unit descriptor

In a typical scenario, a plant uses a biochemical process to produce chemical or biological materials which are the product of that plant. The process may use enzymes such as amylases, moulds such as yeasts and/or bacteria such as e coli. The product may be a chemical compound such as alcohol (which may be able to be produced by chemical synthesis) or biochemical products such as enzymes or proteins.

This unit includes the operation of all associated pumps, dosing pumps, agitation, aeration (if appropriate), temperature control and similar equipment which is integral to the operation of the biochemical process. While biochemical processes are often batch, this unit also applies to continuous biochemical processes.

This unit does NOT apply to ambient temperature biotreating such as might be typical of a waste stream biotreater — see *PMAOPS290A Operate a biotreater.*

This unit does NOT require the operation of a central control panel. Where the operation of a central control panel is part of the job, *PMAOPS305A Operate process control systems* is relevant.

The plant technician would:

- identify and rectify operational problems
- predict the potential impact of changes from other plant sections on biochemical process
- facilitate output changes.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Monitor and control the biochemical processes.	1.1 Get information relevant to the operation of the biochemical process 1.161 Identify changes in key variables such as: • feed • desired output • temperature • agitation • aeration (if appropriate) • microorganism/enzyme 1.162 Keep conditions within the optimum range 1.163 Check performance of ancillaries such as agitation and heat exchange 1.164 Recognise and interpret trends in bioreactor data/appearance 1.165 Recognise the signs of potential and actual problems 1.166 Identify the consequences to the bioreactor processes of the identified changes, trends and problems 1.167 Take action to minimise the impact on safety, health, the environment and the business of potential and actual problems.
2. Ramp output up/down.	2.1 Predict from rates and schedule when a change will be required 2.2 Give advanced notice of change to work team 2.3 Prepare plant for the change 2.4 Predict the required amount of adjustment to cause the required change 2.5 Make the change in a controlled manner without excessive variation 2.6 Monitor the progress of the change and make minor adjustments as required.
3. Maintain effectiveness of bioreactor system.	3.1 Frequently and critically monitor bioreactor system throughout shift 3.2 Use measured/indicated data and smell, sight, sound and feel as appropriate 3.3 Identify critical equipment and processes 3.4 Identify issues likely to impact on the whole plant performance and take appropriate action 3.5 Predict impact of a change in the bioreactor system on other plant units/areas and communicate this to relevant people 3.6 Predict impact of a change in the processing plant on the bioreactor and take appropriate action 3.7 Test trips and alarms as required 3.8 Complete minor maintenance according to procedures.

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Element	Performance criteria
4. Shut down reaction systems.	4.1 Determine type of shut down required 4.2 Give advance warning of shut down where possible 4.3 Change over individual items of equipment 4.4 Shut down individual items of equipment and the entire bioreactor system 4.5 Shut down to a stand-by condition if required 4.6 Shut down in an emergency when required 4.7 Prepare plant for maintenance/vessel entry as required 4.8 Receive plant back from maintenance 4.9 Reset trips and alarms after a shut down 4.10 Prepare plant for the introduction of feed and operation 4.11 Leave plant in a condition ready to restart 4.12 Shut down for maintenance when required.
5. Clean reactors/vessels.	5.1 Identify cleaning requirements 5.2 Clean to requirements according to procedures 5.3 Retain microorganisms contained in the plant and prepare for reuse as appropriate 5.4 Dispose of waste materials according to procedures.
6. Control hazards.	6.1 Identify hazards in bioreactor work area 6.2 Assess the risks arising from those hazards 6.3 Implement measures to control those risks in line with procedures and duty of care.
7. Resolve 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 items initiated through until final resolution has occurred 7.6 Report problems outside area of responsibility to designated person.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the bioreactor system. For your plant this may include (select relevant items):

- pumps (feed and dosing pumps)
- utilities and services such as air
- agitators
- air/gas supply/removal
- temperature control equipment such as heaters, coolers, heat exchangers
- other equipment integral to the operation of the bioreactor system.

Typical problems for your plant may include:

- sudden changes in feed (rate, composition, concentration)
- changes in required production rate
- changes in ambient conditions (eg, summer to winter operation)
- handling a plant shutdown without allowing the microorganisms to die
- control of degree of agitation
- settling/removal/recycling of microorganisms.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 2, 4, 5 and 7). 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

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incidents on similar plants around the world, hazard analysis activities and similar sources.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Competence includes an understanding of the bioreactor system and its integral equipment to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the bioreactor system and describe the function of each
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- state the biochemical changes which are occurring in each stage and the methods of controlling them
- describe the causes and remedies of common problems such as those selected in the range of variables
- describe methods of ramping up/down in to change output 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 bioreactor system and to distinguish between causes of problems/alarm/fault indications such as:

- feed variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	2	1	1	2	2

Unit title

FDFCORGMP3A Monitor the implementation of good manufacturing practice

Unit descriptor

This unit involves monitoring the implementation of good manufacturing practice and developing arrangements that will improve GMP compliance.

In PMA02 it is only relevant to processes manufacturing goods subject to the Therapeutic Goods Act or other similar food or pharmaceutical related processes.

Element	Performance criteria
1. Monitor good manufacturing practice.	1.1 GMP requirements and procedures are communicated to work team 1.168 Work processes and procedures are monitored to confirm compliance with GMP requirements 1.169 Mentoring and coaching is provided to support individuals/groups to implement GMP 1.170 Procedures describing improved GMP requirements are drafted and recommended to designated persons/groups.
2. Respond to non-compliance.	2.1 GMP non-compliance is identified, rectified and/or reported 2.2 Process and procedures for dealing with GMP non-compliance are implemented according to agreed arrangements 2.3 GMP procedures are reviewed and measures are implemented to prevent recurrence.
3. Conduct and participate in GMP audit.	3.1 GMP audit is conducted according to company and legislative requirements 3.2 Audit outcomes/recommendations are reported and followed up as part of the company's continuous improvement system/ processes.

Range of variables

The range of variables provides further advice to interpret the scope and context of this unit of competence.

It assumes:

- work is carried out within company policy and procedures, food safety, good manufacturing practice and legislative requirements
- stock handled by the operator may include raw materials, ingredients, consumables, in-process product, finished product
- contaminants may be classified as physical, chemical, biological
- control points, inspection and tests requirements are contained in company plans/procedures
- monitoring may involve the use of checklists, inspection lists, control charts, equipment

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- equipment is available to detect contaminants
- reporting systems may include electronic and manual data recording and storage systems.

Evidence guide

The evidence guide identifies the skills and knowledge to be demonstrated to confirm competence for this unit. It should be read in conjunction with the Range of variables.

Demonstrated ability to:

- implement work processes and procedures consistent with GMP requirements
- monitor control points to identify GMP compliance
- diagnose GMP non-compliance
- participate in investigating non-compliance problems
- remove/isolate/rectify the non-compliance
- take action to prevent non-compliance occurring/recurring
- draft procedures to improve GMP arrangements
- communicate information about GMP to others
- provide mentoring/coaching support
- plan the conduct of an internal GMP audit
- conduct/participate in GMP audit
- report/record information in the company system.

Underpinning knowledge:

- purpose and significance of compliance with the Code of Good Manufacturing Practice
- the relationship between the Code of Good Manufacturing Practice and standard operating procedures, instructions, and work processes and procedures
- factors which affect implementation of GMP
- risk assessment processes and procedures
- problem solving techniques to identify and rectify GMP non-compliance
- consultative processes to negotiate GMP improvement
- traceability and recall procedures
- mentoring and coaching techniques
- purpose and significance of GMP audits
- purpose and types of GMP audits
- audit responsibilities
- internal audit processes and procedures
- follow-up systems and processes
- reporting/recording systems and processes.

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Unit title

UTPNEG162A Operate and monitor boiler steam/water cycle

Unit descriptor

This unit refers to the operation, inspection and monitoring of boiler steam/water cycle.

Element	Performance criteria
1. Plan and prepare work.	1.1 Safety issues are identified to comply with enterprise/site and legislative requirements 1.2 Work requirements are identified from relevant personnel and documentation 1.3 Documentation to determine plant status is assessed and evaluate 1.4 Localised plant inspection, pre-operational checks and field preparations for service are carried out in accordance with manufacturers and enterprise/site procedures 1.171 Plant operational prerequisites are established in accordance with manufacturers and enterprise/site procedures 1.172 Sequence for recommissioning of plant is determined to suit existing circumstances in accordance with enterprise/site requirements 1.173 Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training.
2. Operate plant.	2.1 Plant is operated in accordance with enterprise and manufacturers operating procedures 2.2 Plant is monitored and observed to detect deviations from normal operating conditions 2.3 Corrective actions taken or reported, to rectify abnormalities, are in accordance with industry standards and site requirements 2.4 Plant to be removed from service is locally identified and is removed from service in accordance with enterprise/site requirements 2.5 Corrective actions are taken in accordance with enterprise safety rules and site requirements when abnormalities are identified during the removal from service.
3. Test plant operation.	3.1 Tests are performed in accordance with defined procedures applicable to the operational test 3.2 Plant is observed for correct operational response 3.3 Corrective action is taken when response is not in accordance with documentation, plant integrity or personnel safety requirements 3.4 Plant is returned to required operational status upon completion of test.

Element	Performance criteria
4. Analyse plant faults.	4.1 Causes of abnormal plant operating conditions are identified by analysing the technical and operational information in a logical and sequential manner 4.2 Corrective action taken is in accordance with enterprise/site procedures 4.3 Plant integrity and personnel safety are maintained through consultation with appropriate personnel, and with reference to plant, technical and operational documentation.
5. Monitor and inspect plant.	5.1 Plant to be monitored/inspected is physically identified 5.2 Plant is monitored/inspected for normal operation or to detect deviations 5.3 Corrective action taken is in accordance with enterprise/site procedures 5.4 Appropriate personnel are notified when defects are detected
6. Complete documentation.	6.1 Documentation is updated and plant problems, movements, and abnormalities and status are reported and logged in accordance with enterprise/site procedures.

Range of variables

Stream: Production plant

Field: Operations

Equivalencies: This unit of competence incorporates parts of units 7.24a and 7.25a of the National Metal and Engineering Competency Standards

Systems, plant and/or equipment may include:

- electrical supply switchboard(s) and transformers
- electrical motors
- valves and actuators (electric, hydraulic and pneumatic)
- supervisory, alarm
- protection and control equipment
- boiler circulation systems
- boiler filling systems
- boiler venting and draining systems
- cooling water plant and equipment
- filters
- strainers
- moisture removal devices
- pressure control devices
- safety devices
- high and low pressure systems
- boiler water level indicators.

Safety standards may include relevant sections of:

- occupational health and safety legislation
- enterprise safety rules

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- relevant State and Federal legislation
- national standards for plan
- Australian standards.

Information and documentation sources may include:
- verbal or written communications
- enterprise safety rules documentation
- equipment and alarm manuals
- dedicated computer equipment
- enterprise standing and operating instructions
- enterprise log books.

Technical and operational indicators may include:
- stimuli (audio, smell, touch, visual)
- remote or local indicators and recorders and alarms (visible and or audible).

Communications may be by means of:
- telephone
- two way radio,
- pager, computer (electronic mail),
- operating log (written or verbal)
- public address system.

Tests may include laboratory test for:
- water quality and impurities
- alarm testing
- leak test
- safety valve float.

Appropriate personnel to consult, give or receive direction may include,
- supervisor/team leader or equivalent,
- power plant operations personnel or equivalent,
- technical and engineering officers or equivalent,
- maintenance staff
- contractor personnel.

Test, fault finding and operating tools may include power or hand tools. Operating environment may be during inclement or otherwise harsh weather conditions, in wet/noisy/dusty/hot areas and during continuous operation.

Faults and abnormal operating conditions may include
- motor/pump/ actuator/valve failure/malfunctions,
- control equipment failure/malfunctions,
- loss of electrical supply to plant and equipment,
- excessive vibration pumps/motors,
- loss/low cooling water pressure,
- boiler tube leaks,
- low/high steam pressure/temperature,
- plant equipment failure
- loss of control air supply.

Evidence guide

Critical aspects of evidence

The knowledge and application of relevant sections of:

- occupational health and safety legislation
- statutory legislation
- enterprise/site safety procedures
- enterprise/site emergency procedures.

Preparation and planning of work.

Operation of boiler water/steam cycle.

Operationally testing plant.

Analysing plant faults.

Monitoring plant operation.

Context of assessment

Competency standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions.

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and application of equipment operated.

Interdependent assessment of unit

Nil

Knowledge and skills

A knowledge of:

- relevant occupational health and safety regulations
- relevant statutory legislation
- relevant enterprise/site safety procedures
- enterprise/site emergency procedures and techniques
- relevant plant and equipment, its location and operating parameters
- plant status
- environment all legislation
- enterprise recording procedures
- communication principles
- control and data acquisition systems
- computers and software
- supervisory, alarm, protection and control equipment
- emergency procedures
- basic motor performance
- basic pump and compressor performance
- valve, damper and actuator types and characteristics
- principles of venting/draining steam or water under extremely high temperature and pressure
- thermodynamics
- the process.

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The ability to:

- apply relevant occupational health and safety regulations
- apply relevant statutory legislation
- apply relevant enterprise/site safety procedures
- apply enterprise/site emergency procedures and techniques
- apply enterprise recording procedures
- identify plant status
- prepare plant/equipment for operation
- organise resources
- operate boiler water/steam cycle
- apply diagnostic and testing techniques
- identify and respond to abnormal plant operating conditions
- plan and prioritise work
- use relevant hand tools
- communicate effectively
- apply data analysis techniques and tools
- use diagrams, drawings and symbols.

Unit title

UTPNEG210A Manage, operate and monitor turbine

Unit descriptor

This unit refers to the management of an in-service steam turbine.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Plan and prepare work.	1.1 Safety issues are identified to comply with enterprise/site requirements 1.174 Work requirements are identified from relevant personnel and documentation 1.175 Pre-operational checks are carried out on plant according to manufacturer's recommendations and site requirements 1.176 Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training.
2. Operate plant.	2.1 Turbine output is adjusted to meet demand whilst observing operating requirements and minimising turbine life expenditure 2.2 Plant is operated in accordance with enterprise and manufacturer's operating procedures 2.3 Plant is monitored and observed to detect deviations from normal operating conditions 2.4 Corrective actions are taken to rectify abnormalities in accordance with manufacturer's and enterprise procedures.
3. Test plant operation.	3.1 Tests are performed in accordance with defined procedures applicable to the operational test 3.2 System and plant is observed for correct operational response 3.3 Corrective action is taken when response is not in accordance with documentation, plant integrity or personnel safety requirements 3.4 Plant is returned to required operational status upon completion of test.

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Element	Performance criteria
4. Analyse system faults.	4.1 Causes of abnormal plant operating conditions are identified by analysing the technical and operational information in a logical and sequential manner 4.2 Corrective action taken is in accordance with enterprise/site procedures 4.3 Plant integrity and personnel safety is maintained through consultation with appropriate personnel, and reference to plant, technical and operational documentation 4.4 Appropriate person are notified when defects are detected.
5. Monitor plant.	5.1 Plant to be monitored is identified 5.2 Plant is monitored for normal operation or to detect deviations 5.3 Appropriate personnel are notified when defects are detected.
6. Complete documentation.	6.1 Documentation is updated and plant problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures.

Range of variables

Stream: Production plant

Field: Operations

Equivalencies: This unit of competency is mapped to Schedule C, turbine operation, of the Worksafe Australia standards [NOHSC:1006(1992)]

Plant and equipment may include

- turbine and auxiliary plant
- turbine lubrication and power/control oil systems
- turbine by-pass system plant
- condensate and feedwater system plant to boiler economiser inlet NRV
- condensate polishing plant
- high and low pressure heating systems
- steam condensing and cooling systems
- condenser vacuum raising equipment
- turbine glad sealing equipment
- cooling water systems plant
- boiler feedwater deaerating equipment
- condensate and feedwater chemical treatment equipment
- electric motors AC and DC
- electricity distribution systems AC and DC
- station water distribution systems
- hydraulic oil system; pumps
- compressed air systems
- computers with equipment control functions
- supervisory, alarm, protection and control equipment
- diesel engine driven auxiliary plant.

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Safety standards may include

- relevant sections of occupational health and safety legislation
- enterprise safety rules
- Australian standards
- national standards for plant
- relevant State and Federal legislation.

Information and documentation sources may include

- verbal or written communications
- enterprise safety rules documentation
- enterprise operating instructions
- manufacturer's operational and maintenance manuals
- equipment and alarm manuals
- enterprise log books
- dedicated computer equipment
- enterprise standing instructions
- plant notes.

Technical and operational indicators may include

- stimuli (audio, smell, touch, visual)
- remote or local indicators and recorders
- computers
- alarms (visible and or audible).

Communications may be by means of

- telephone
- two way radio
- pager
- computer (electronic mail)
- operating log (written or verbal).

Tests may include

- loss of a major auxiliary controls response checks
- stand-by plant "cut-in" tests
- valves operating checks
- on-load turbine valve and emergency governor operation test
- tests
- boiler feed pumps "low load leak off" valve operation tests
- heater leak checks
- alarm and protection tests.

Appropriate personnel to consult, give or receive direction may include

- supervisor/team leader or equivalent
- other coordinators of energy production or equivalent
- technical and engineering officers or equivalent
- maintenance staff
- other operating staff
- contractor staff.

Operating environment may be

- remote from plant and equipment being operated

- where operation is assisted by remote indicators of plant status and other parameters monitored
- in wet/noisy/dusty/hot areas
- during night periods
- during inclement or otherwise harsh weather conditions.

Faults and abnormal operating conditions may include

- loss of a major auxiliary
- loss of electrical supply to auxiliaries)
- turbine water ingress
- excessively high turbine and turbine valves heating/cooling rates/differentials
- high condenser vacuum
- condenser tube leak
- high dissolved oxygen, conductivity
- high turbine bearing temperatures/vibration
- high/low bearing oil temperature
- loss of turbine bearing oil flow/pressure
- low/high pressure heaters malfunctions
- actuator/valve mechanical/electrical faults/failure
- failed field devices
- turbine protection.

Evidence guide

Critical aspects of evidence

- The knowledge and application of relevant sections of:
  - OHS legislation
  - statutory legislation
  - enterprise/site safety procedures
  - enterprise/site emergency procedures.
- The preparation and planning of work
- The operation of turbine plant and equipment
- Operationally testing plant
- Analysing plant faults
- Monitoring plant operation
- The knowledge of the system components and their interaction
- The knowledge of turbine operational processes
- The knowledge of turbine supervision and control systems.

Context of assessment

Competency standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions.

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and application of equipment operated.

Knowledge and skills

A knowledge of:

- relevant occupational health and safety regulations
- relevant statutory legislation

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- relevant enterprise/site safety procedures
- enterprise/site emergency procedures and techniques
- relevant plant and equipment, its location and operating parameters
- plant status
- environmental legislation
- enterprise recording procedures
- communication principles
- control and data acquisition systems
- computers and software
- supervisory, alarm, protection and control equipment
- emergency procedures
- valve and actuator types and characteristics
- turbine speed control equipment
- heat transfer principles
- the system components and interaction
- electricity distribution systems AC and DC
- the system components and their interaction with other plant and equipment external to that covered by this competency
- station water distribution systems
- fire protection control systems
- compressed air systems
- principles of condensate and feedwater chemical treatment
- turbine life expenditure and control
- turbine bypass system
- vacuum raising and turbine gland sealing systems
- introduction to power production plant
- typical arrangements of power production plant
- mathematics
- mechanics
- thermodynamics
- properties of matter
- lubrication and bearings
- pumps
- liquid pumping systems
- power plant cycle
- general responsibilities for power production plant operations
- turbine construction and operating principles
- turbine lubrication and oil systems
- condensate and feedwater systems
- feedwater heating and drainage systems
- circulating water system
- condenser systems
- turbine operations
- turbine efficiency
- electrical principles
- transformers
- electric motors
- switchgear
- heating of electrical equipment

- electrical protection
- schematic diagrams
- safe operating principles.

The ability to:

- apply relevant occupational health and safety regulations
- apply relevant statutory legislation
- apply relevant enterprise/site safety procedures
- apply enterprise/site emergency procedures and techniques
- apply enterprise recording procedures
- identify plant status
- prepare plant/equipment for operation
- organise resources
- operate turbine plant and equipment
- apply diagnostic and testing techniques
- identify and respond to abnormal plant operating conditions
- plan and prioritise work
- use relevant hand tools
- communicate effectively
- apply data analysis techniques and tools
- use diagrams, drawings and symbols
- coordinate the operation of equipment to maintain plant integrity, personnel safety, continuity of supply and optimum efficiency.

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Unit title

PMAOPS400A Optimise operating systems

Unit descriptor

In a typical scenario, a plant technician in a large plant will optimise a complete production area or a plant technician in a small plant will optimise the entire plant. This would typically be conducted as an optimisation project looking at achieving an improvement in the plant/plant area overall, rather than just an improvement in one or more of its components. This person would typically be a senior technician, team leader or front line manager and may be the lead technician of a shift team.

It includes ensuring that:

- production systems comply with OHS and environmental requirements
- process, plant and equipment utilisation is planned, carried out and problems solved to fully meet operational needs, and
- the production of finished goods meets customer requirements.

The optimisation may include materials, process, plant and/or procedure modifications and may be carried out alone or more commonly as part of a team and in liaison with a plant engineer, chemist or other technical expert. Where this is the case, the technician must have had a lead technical role and be able to provide evidence of having performed all elements of this unit of competency themselves.

This competency requires the application of detailed operational and process knowledge, including the principles of operation of all major equipment, the chemistry and/or physics of changes to materials occurring during processing, and the processing variables which control those changes. It embodies significant depth and breadth of technical process knowledge.

This unit does not apply to continuous improvement work, as it applies to a larger, integrated area of plant and requires greater technical expertise. Use *PMASUP300A Identify and implement opportunities to maximise production efficiencies* for continuous improvement.

This unit is primarily about the process performance of the plant and equipment rather than the engineering performance of equipment (see *PMBMAINT303B Identify equipment faults*).

Prerequisites

This unit **has** the prerequisites of:

- PMASUP390A Use structured problem solving tools
- PMASUP300A Identify and implement opportunities to maximise production efficiencies

and at least one relevant OPS300 unit.

Element	Performance criteria
1. Analyse and evaluate current performance of plant/plant area.	1.1 Determine desired outcomes from optimisation 1.177 Compare actual process, plant and equipment performance with requirements 1.178 Identify abnormal or suboptimal process, plant and equipment performance 1.179 Collect and evaluate batch and/or historical records to determine possible causes for sub-optimal performance 1.180 Use appropriate techniques to rank possible causes from most to least probable cause.
2. Develop plan for optimisation action.	2.1 Analyse cause(s) to determine appropriate action(s) 2.2 Predict the impact of a change in one unit/area on other related plant units/areas 2.3 Develop measurable objectives and evaluate alternatives 2.4 Develop optimisation plan and communicate to appropriate personnel 2.5 Ensure hazard analysis procedures are completed and findings included in plan 2.6 Develop evaluation criteria and baseline data to determine effectiveness of optimisation.
3. Co-ordinate action to optimise process, plant and equipment performance.	3.1 Co-ordinate all appropriate unit areas and operations in order to rectify problem causes in process, plant and equipment performance 3.2 Implement and/or initiate all required optimisation actions 3.3 Communicate the outcomes of these actions to all relevant personnel 3.4 Implement procedures/systems to eliminate possible future causes of problem 3.5 Record and maintain log of all required information 3.6 Ensure operating procedures and other relevant plant documentation are updated.
4. Evaluate changes.	4.1 Collect appropriate data to evaluate outcomes of optimisation project 4.2 Analyse evaluation data and determine effectiveness of optimisation 4.3 Determine areas requiring further improvement 4.4 Initiate continuous improvement processes as required.

Range of variables

Context

This competency unit includes all such items of equipment and unit operations which form part of the production process of the area being optimised.

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Typical problems for your plant may include (choose one of the below or another appropriate problem):

- increasing throughput
- increasing reliability/reducing downtime/increasing uptime
- reducing quality variability
- improving energy efficiency
- plant/process redesign to reduce hazard profile
- 'debottlenecking'
- reducing waste/muda.

All operations are performed in accordance with procedures.

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.

Evidence guide

Assessment context and methods

The unit 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 generally be by the evaluation of an optimisation project, ideally carried out on a plant, but may be by an optimisation project based on a real situation but carried out independently of an actual plant optimisation. Where the optimisation is conducted on an actual plant, care must be exercised to avoid contamination of the evidence with plant factors which are beyond the control of the technician. It should also be recognised that implementation may be beyond the authority of the technician and/or beyond a reasonable time frame for assessment.

This unit of competency requires a significant body of knowledge which will be assessed through questioning either during or subsequent to the optimisation project.

Critical aspects

Competence must be demonstrated in the ability to analyse data and determine the most appropriate action(s) to achieve the desired optimisation outcomes.

A structured and reasoned approach should be demonstrated. In particular look to see that:

- possible causes of complex problems are identified based on experience and the use of analytical techniques in solving problems and identifying cause(s)
- single, multiple and recurring problems are identified and discriminated between
- the range of possible causes can be identified and analysed and the most likely cause determined
- the fundamental, underlying or root cause of problems is determined and addressed
- actions are taken to avoid a recurrence of the problem
- the timelines of actions is appropriate.

Resource implications

Assessment will require access to evidence of the conduct of the optimisation project. A bank of scenarios/case studies will be required where optimisation is not undertaken as part of the operation of a plant.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, communication, leadership and quality units.

Essential knowledge

Competence includes an understanding of the entire plant area, its systems and integral equipment to the level needed to analyse causes of suboptimal performance and recommend methods of optimising performance. In particular it includes the ability to:

- identify all items on a schematic of the plant area 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 problems causing suboptimal performance.

Note that it is not necessary to know all these things at the beginning of the optimisation project, but the person must have the ability to find, interpret and use such information as is relevant to the optimisation project.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	2	2	2	2	3	3

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Unit title

PMAOPS401B Trial new process/product

Unit descriptor

This competency typically applies to a technician in a plant who is taking a lead technical role in the trialing of a new product or the trialing of a new or significantly altered process. This competency does not apply to minor modifications to existing products or processes, which may be better covered by *PMASUP300A Identify and implement opportunities to maximise production efficiencies.* Similarly it does not apply to a technician taking part in such trials, and simply following directions. This is part of their routine job and as such is part of the competency relevant to that unit operation.

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.

The technician would be expected to operate and control all equipment required for the trial. Generally the plant 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 probably 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 are expected to have the competence to do so and to be directing the operation of equipment as appropriate throughout the trial. At all times they would be liaising and cooperating with other members of the team.

Trialing 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. Trialing may be done on a pilot plant where available and/or on a full scale plant.

Prerequisites

This unit has the prerequisites of at least one relevant OPS300 unit.

Element	Performance criteria
1. Contribute to the selection of equipment/process conditions.	1.1 Liaise with appropriate technical expert(s) 1.181 Interpret properties of materials and desired product characteristics 1.182 Interpret technical specifications/drawings of plant requirements 1.183 Recommend equipment/ancillary equipment appropriate for the materials, products and conditions 1.184 Recommend process conditions appropriate for the equipment, materials and product characteristics 1.185 Recommend feed rates/order/condition appropriate to the process conditions, equipment, materials and product characteristics 1.186 Ensure hazard identification and analysis procedures are completed, including consultation with stakeholders, and findings included in plan 1.187 Ensure recommendations meets 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 expert/stakeholder 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 3.9 Leave plant in a condition suitable for routine production to recommence.

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Element	Performance criteria
4. Evaluate results and identify modifications.	4.1 Interpret data from trial 4.2 Identify factors which might be related to low rates/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.

Range of variables

Context

This unit of competency includes all items of equipment and unit operations which form part of the trial.

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 procedures may include:

- hazard and operability (HAZOP) studies
- hazard analysis (HAZAN) studies
- other company specified procedures.

Hazards may be determined from:

- materials safety data sheets (MSDSs) or other relevant documentation such as hazard logs, incident reports
- company hazard identification procedures
- hazard analysis results.

Waste handling may include:

- collection for reuse
- recycling
- disposal in accordance with health and environmental regulations.

Typical problems for your trial might include:

- 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.

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.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be on an operating plant. The plant may be a pilot plant or a production plant as appropriate. The unit 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.

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

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:

- 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.

It is not expected that the candidate will be able to conduct technical hazard analysis procedures but they should be able to interpret and use the outcomes of such analyses.

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

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Resource implications

Assessment will require access to an operating plant or pilot plant over the period of the trial, or a suitable method of gathering evidence of their ability to conduct a trial. Generally evidence of having conducted one complete trial of a completely new product will be sufficient. A greater number of trials will be required for simpler trials. 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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, communication and leadership units.

It may be appropriate to assess this unit concurrently with:

- PMAOHS300 Implement and monitor OHS policies and procedures for a work group
- PMAOHS401 Assess risk.

Essential knowledge

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 of variables
- 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.

Key competencies

1 Collect, analyse and organise information	2 Communicate ideas and information	3 Plan and organise activities	4 Work with others and in teams	5 Use mathematical ideas and techniques	6 Solve problems	7 Use technology
3	3	3	3	2	3	3

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Unit title

PMAOPS410A Monitor remote production facilities.

Unit descriptor

In a typical scenario, a technician in a large plant looks after the operation of a remote production facility. This may be achieved by using ground based or satellite communications systems. The competency covers the operation and management of either remote treatment stations or satellite locations.

Typically these stations may include:

- wellheads
- separation facilities
- utility systems
- remote pumping and compression stations
- fire and gas safety systems and associated piping and instrumentation.

The operations technician would:

- identify and rectify operational problems
- conduct well testing
- conduct critical function testing.

Control of a remote production facility may require operation and process monitoring via a remote control system. Generally the operations technician would operate independently and be expected to be capable of performing all parts of this unit. However they may be part of a team during critical inspections or maintenance operations. At all times they would be liaising and cooperating with other members of the team.

Prerequisites

This unit **has** the following prerequisites:

- PMAOPS305A Operate process control systems
- other OPS units relevant to the remote facilities monitored.

Element	Performance criteria
1. Conduct product separation.	1.1 Centralise and prepare well products for initial multi-phase separation, storage and distribution as determined by the required production targets and objectives 1.2 Use multi-phase high and low pressure separation, utilising heat and chemical treatments, to effectively separate the product 1.3 Monitor the separation process via control room operation to ensure all product flows, pressures and temperatures are maintained within correct operating parameters 1.4 Operate and monitor all required utility services to assist in the separation process.

Element	Performance criteria
2. Recover and measure product.	2.1 Transfer treated waste water from the separation process for further treatment as required prior to re-injection or disposal 2.2 Ensure that all available product is recovered and all waste water is made safe for further use or disposal within environmental limits 2.3 Measure and sample all produced gas to determine the product's appropriate properties and composition 2.4 Measure collected product to determine the level of available stocks for further transfer and for accounting purposes.
3. Transfer product.	3.1 Check transfer process equipment required to ensure it is working within agreed operating parameters 3.2 Transfer product to a processing facility for further treatment and enhancement.
4. Record transfer details.	4.1 Log and record all product transfers and forward to the processing facility to provide an up to date indication of production flows 4.2 Distribute data collected to appropriate personnel to assist them with the ongoing management of wells and reservoirs.
5. Conduct operational maintenance.	5.1 Undertake basic maintenance on facility equipment to maintain the correct operating capacity of production equipment 5.2 Schedule and prioritise any major maintenance requirements with appropriate service units or personnel.
6. Control hazards.	6.1 Identify hazards in the remote facility 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. Resolve 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 items initiated through until final resolution has occurred 7.6 Report problems outside area of responsibility to designated person.

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Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the remote facility. For your enterprise this may include (select relevant items):

- valves
- pumps
- prime movers
- compressors
- separators
- instrumentation
- storage tanks, ponds and dams
- filters
- wellheads
- hydraulic well control panels
- fire and gas safety systems.

Typical problems for your plant may include:

- contamination of product
- control of temperature and pressure
- variations in feed
- vibration.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 1 to 5). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.

This unit of competency requires an application of the knowledge contained in the operation of the remote facility and its integral equipment, to the level needed to maintain control and recognise and resolve problems. This can be assessed through

questioning and the use of what if scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

Consider co-assessment with other units relevant to the job.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- all items on a schematic of the remote system and the function of each
- nature/condition of materials entering and leaving each stage of the process
- changes which have occurred in that stage and why they have occurred
- causes and remedies of common problems such as those selected in the range of variables
- methods of changing production rates and the advantages and disadvantages of each
- effect of specific climatic and environmental factors
- water testing and gas break through testing techniques
- storage and transfer techniques related to the transport of oil, gas or water.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the compressor system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- product contamination
- instrument failure/wrong reading

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- electrical failure
- mechanical failure
- operational problems
- pressure losses and leakage.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

Unit title

PMAOPS411A Manage plant shutdown and restart

Unit descriptor

In a typical scenario, a complex and integrated plant (usually but not necessarily large and continuous) needs to be shut down for some reason. Shutting down is a complex process, and is more than the simple turning off of a switch.

This competency would typically be exercised by the leading plant technician on a shift. It covers the co-ordination of the shutdown and restarting of the production process in a safe and efficient manner due to a planned or an unplanned shutdown or emergency situation. It does not apply to individual plant operators shutting down individual production units or following directions during a shutdown, as this is included in the normal unit of competency for operating that production unit.

This unit requires the exercise of discretion as the plant technician's responses are governed by the cause of the shutdown and the plant's responses to that. They are required to adapt normal practice, within the overall guidelines, to the current situation to obtain the best outcome.

This competency requires the coordination of all personnel involved in the shutdown to ensure it happens in as orderly a fashion as possible and that the plant is left in the best condition possible for a quick restart. The person exercising this competency needs to balance the varying requirements to ensure the shutdown occurs with maximum safety to personnel, plant, the environment and the business's productivity (in that order).

Prerequisites

This unit **has** a prerequisite of at least one relevant OPS300 unit..

Element	Performance criteria
1. Manage shutdown sequence.	1.1 Check and verify automatic safety systems to ensure that the unit has been made safe 1.188 Identify the reason for,or cause of the shutdown by troubleshooting the system and by utilising all available data and information systems 1.189 Obtain confirmation of the identified shutdown from field based operators to verify both the nature and the reliability of the shutdown 1.190 Rectify or initiate procedures to rectify the fault or shutdown cause through either repair of the operational fault or readjustment before returning the system to start-up status.
2. Conduct start-up process.	2.1 Satisfy all start-up permissives prior to start- up process being commence 2.2 Conduct start-up in accordance with agreed procedures and site requirements, and in a safe and efficient manner, ensuring a return to steady state operation is achieved.

Element	Performance criteria
3. Document shutdown and start-up process.	3.1 Complete all logs and workplace documentation relating to the shutdown/start-up process, ensuring all details, actions and responses are accurately recorded 3.2 Record any further ongoing production problems and report to appropriate persons or authority.

Range of variables

Context

Causes of shutdown may be:

- planned,
- unplanned or
- emergency.

The shutdown may be:

- shutdown 'to cold'
- short shutdown to allow minor work
- managing a plant trip and restart

This competency also includes:

- coordinating the shift team
- implementing emergency procedures
- using the permit to work system (for repairs required).

All operations are performed in accordance with procedures.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of this unit of competency as shutdowns may not occur with sufficient frequency or planning to allow for assessment. Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what if scenarios both on the plant (during

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demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to full performance
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

The person undertaking this competency is expected to be able to work under and manage situations of high pressure, in order to ensure the safe and efficient management of the control room production process and the safety of plant employees.

Essential knowledge

Demonstration of competence in this unit must include knowledge of the following

- architecture of the process/production systems
- the plant
- product specifications and tolerances
- systems operating parameters
- process control philosophies and strategies
- the process
- emergency shutdown procedures
- physics, chemistry and mathematics relevant to the process
- outside process knowledge and equipment operation

as is relevant to the practical operation of equipment at that job level.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	1	2	1	2	2

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Unit title

PMAOPS450A Solve colour problems

Unit descriptor

This unit applies a knowledge of colour to solving colour problems both for external customers and in the plant (ie, colour is/appears to be wrong).

In a typical scenario, a technician receives a complaint arising from either an external customer or an internal customer, such as a production manager or team leader. The complaint concerns colour which is not as the complainant expected it to be. The technician gathers the appropriate data, then makes an analysis as to the cause of the problem and makes recommendations as to how this problem might be rectified. The complaints may include:

- the colour as made does not match the standard
- the colour as provided does not match the standard
- the colour initially appeared correct, but is now unsatisfactory.

The technician would:

- clarify the problem
- analyse problem cause(s)
- recommend a solution to the problem.

Generally the technician would work alone for this unit, although the ability to communicate with all internal and external customers and stakeholders (simply referred to as 'customers') is vital.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Assist customer to articulate problem.	1.1 Clarify customer perception of problem 1.191 Assess opportunities for a targeted response to meet customer needs 1.192 Identify the rights and responsibilities of the customer and effectively communicate these to the customer 1.193 Clarify the history of the problem 1.194 Define problem and complete records.
2. Analyse possible problem cause(s).	2.1 Examine the colour of the object/surface and • compare to standard to determine if colour faulty • determine potential causes if colour faulty 2.2 Analyse history of problem for potential causes 2.3 Question customer to clarify issues revealed by examination 2.4 Take samples and arrange for tests as appropriate 2.5 Determine range of possible causes consistent with data available 2.6 Determine most likely cause(s) of defined and observed problem.

Element	Performance criteria
3. Satisfy customer needs.	3.1 Determine appropriate strategies and activities to resolve problem 3.2 Negotiate proposed solution with customers and other relevant parties 3.3 Identify potential areas of difficulty in customer service delivery and take appropriate actions to address them 3.4 Follow items initiated through until final resolution has occurred 3.5 Meet customer needs within the scope of area of responsibility 3.6 Report problems outside area of responsibility to designated person. 3.7 Follow procedures where a decision is made to terminate a service 3.8 Complete reports to procedure.

Range of variables

Context

This unit of competency includes colour problems both in the plant and within the customer's site (ie, it includes both internal and external customers). This may include (select relevant items):

- batches during manufacture do not conform to colour specification
- colour as supplied to customer does not conform
- colour as applied to substrate does not conform
- colour variation within the product
- colour was initially satisfactory but has changed over time
- other colour problem.

Typical problem causes may include:

- wrong colourant
- wrong colourant amount
- incorrect processing/mixing/dispersing
- incorrect substrate preparation (eg, of painted/printed surface)
- incorrect application (eg, of paint/ink)
- incorrect colour measurement and testing
- defect standard
- process changes and variations.

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.

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Evidence guide

Assessment context and methods

Assessment for this unit of competency will be using real or simulated colour problems. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include a range of colours, problem causes and environments.

Simulation may be used for assessment of this unit of competency. Simulation should be based on the actual colour problems and should include the use of case studies/ scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what if scenarios.

Critical aspects

Competence must be demonstrated in the ability to define and analyse the problem as well as deal with the customer. The customer should be satisfied with the solution, as well as the solution being technically sound.

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

- different types of problems can be analysed and resolved
- different types of customers can be satisfied
- the range of possible causes can be identified and analysed and the most likely cause determined
- 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.

Resource implications

Assessment will require a suitable method of gathering evidence of colour problem solving ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Competence includes an understanding of colour and the interaction of colour components during processing and in application. A knowledge of the impact of weathering/aging on colour as appropriate to the product is also required. In particular it includes the ability to:

- distinguish between colour variations caused by materials or processing errors
- distinguish between colour variations caused by faulty surface preparation or application

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- interrogate customers to obtain all relevant information, but in a manner which is pleasing to the customer
- explain the causes of colour variation in a manner which will be understood and accepted by the customer
- describe the causes and remedies of common problems such as those selected in the range of variables.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	3	2	2	1	3	2

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Unit title

PMAOPS511A Determine energy transfer loads

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. This competency is typically performed by senior technicians. It includes:

- conduction, convection and radiation
- thermal properties of materials, particularly process materials
- methods of heating process materials
- cooling systems
- energy balances.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Calculate heat transferred from/to items.	1.1 Calculate conductive heat transfer to/from an object 1.2 Calculate convective heat transfer to/from an object 1.3 Calculate heat transfer from/to steam 1.4 Calculate radiative heat transfer to/from an object 1.5 Calculate combined heat transfer to/from an object, including resistances in series and parallel.
2. Calculate temperature change.	2.1 Calculate temperature change caused by heating/cooling of process materials in typical examples of processing equipment 2.2 Calculate change in heat content caused by chemical reaction 2.3 Calculate temperature rise caused by chemical reaction.
3. Select appropriate heating and/or cooling mechanism for an application.	3.1 Compare rates of heat transfer/overall heat transfer coefficients for major methods of heating and cooling 3.2 Determine appropriate methods of varying/controlling rates of heat transfer 3.3 Calculate heat transfer rates under a range of conditions.
4. Conduct energy balance over process components.	4.1 Determine desired boundaries for energy balance calculation 4.2 Determine possible sources of data required from the plant 4.3 Match and adjust sources of data to desired boundary for energy balance 4.4 Determine overall heating load 4.5 Determine overall cooling load 4.6 Determine the adequacy (or otherwise) of the process/plant heating/cooling system to cope with this load.

Range of variables

This competency unit includes the heating/cooling loads of all processing equipment and requires the quantitative determination of loads. This competency applies to all sectors within the chemical, hydrocarbons and oil refining industry.

Heat transfer modes include:

- conduction
- convection (forced and natural)
- radiation
- combined conduction/convection.

Sources of heating/cooling include:

- chemical reaction
- water cooling
- air cooling
- steam heating (calculations for saturated steam only)
- hot fluid (eg, oil) heating.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

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

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.

Resource implications

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.

Other assessment advice

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In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Knowledge and understanding of heat transfer principles and calculations sufficient to determine the heating/cooling loads of an existing or a new process. Competence 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.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	2	2	2	3	3	3

Unit title

PMAOPS512A Determine mass transfer loads

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. This competency is typically performed by senior technicians. It includes:

- calculating mass flow rates
- density variations with changes in temperature (and pressure where appropriate)
- mass changes resulting from a chemical reaction
- mass flow of components of a mixed stream
- mass balances.

Note that this unit uses the term 'flow rate' and similar terms. This may be the flow rate in terms of kg/h, or kg/batch or similar conceptual flows.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Calculate mass flow rates of streams.	1.1 Calculate mass flow rate of plant streams from volumetric data, correcting for changes in density
	1.2 Calculate mass flow rate of individual components of plant streams from their concentrations
	1.3 Calculate mass accumulation (+ or -) within a plant item.
2. Calculate mass change due to a chemical reaction.	2.1 Determine yield from reaction of all significant products
	2.2 Determine mass output of all significant products arising from the reaction for specified reactant inputs.
3. Conduct mass balance over process components.	3.1 Determine desired boundaries for mass balance calculation
	3.2 Determine possible sources of data required from the plant
	3.3 Match and adjust sources of data to desired boundary for mass balance
	3.4 Determine overall mass balance
	3.5 Determine mass balance for each significant component/ reactant and product
	3.6 Determine the adequacy (or otherwise) of the process/plant heating/cooling system to meet production requirements.

Range of variables

This competency unit includes the mass transfer into and out of all processing equipment and requires the quantitative determination of mass transfer loads. This competency applies to all sectors within the chemical, hydrocarbons and oil refining industry.

Mass transfer modes include:

- simple (physical) mixing

- simple (physical) separation
- changes in component mass flow rates due to chemical reaction (including mixing and separation using chemical reaction).

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Assessment will typically be by a mass balance project(s).

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what if scenarios both on the plant and off the plant.

Critical aspects

Competence must be demonstrated in the ability to complete a mass balance in a structured way, taking real data from an operating plant.

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

- realistic boundaries are drawn for the mass balance which align with practical sources of data from the plant
- data is collected from the plant with minimum disruption to production
- theoretical and practical requirements for the mass balance are consistent
- the mass balance data is used to identify and contribute to solutions for plant problems.

This will typically be assessed by one or more mass balance projects on an operating plant. One complex mass balance, or a number of simple mass balances, are required to demonstrate competence.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Knowledge and understanding of mass transfer principles and calculations sufficient to determine the mass transfer loads of an existing or a new process. Competence includes the ability for the practical completion of the job to apply and/or explain:

- changes in density with temperature (and pressure where appropriate)
- stoichiometry of chemical reactions
- mass balances.

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Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	2	2	2	3	3	3

Unit title

PMAOPS520B Manage utilities

Unit descriptor

In a typical scenario, a senior plant technician manages the use of utilities by all units within the plant as a whole (or a significant plant area) and takes actions which will lead to a more efficient use of these utilities. Utilities is used to mean:

- steam (saturated and/or superheated)
- air (instrument, safety, process and/or mechanical)
- water (cooling and/or process)
- fuel (gas, oil)
- other heating/cooling mediums (oil, 'Dowtherm', brine)
- electricity.

This unit does NOT apply to the routine monitoring of water systems or utilities which are covered by *PMAOPS204A Use utilities and services.*

The plant technician would:

- identify sources and uses of the relevant utilities
- check the efficiency of use of the utility
- take action to increase the efficiency of use of the utility — the action might range from implementing changes to reporting problems and recommendations to coordinating others implementing the changes.

Generally this would be a significant role of a senior plant technician who in the exercise of that role would consult and liaise with a range of other personnel and technical experts, both internally and external to the company, within company guidelines.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Identify source and use of all utilities on plant.	1.1 Obtain current piping diagram 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 by each plant item 2.3 Physically check each item of equipment for signs of inefficient utility use (eg, faulty steam traps, leaks) 2.4 Compile report/database showing actual usage of utilities and observed problems.

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Element	Performance criteria
3. Determine efficiency of use.	3.1 Determine theoretical consumption of utilities for equipment items from engineering specifications, by calculation or other methods 3.2 Compare actual consumption of utilities with theoretical consumption 3.3 Determine inefficient users of utilities 3.4 Compile report/database showing efficiency of use of utilities.
4. Take required action to improve utility efficiency.	4.1 Rank inefficient users in priority order for remediation based on costs and business requirements 4.2 Investigate and determine cause(s) of inefficiency in the higher ranked users 4.3 Develop plans to remove the causes of inefficiency 4.4 Identify any safety, health and environmental (HSE) implications of planned actions and address prior to any implementation of changes 4.5 Consult with relevant stakeholders regarding HSE implications and the implementation of these plans 4.6 Initiate corrective action for items within scope of authority 4.7 Follow through on items to facilitate a timely completion 4.8 Report/make recommendations on required improvements which are beyond scope of authority to action.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which use utilities.

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.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

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 to assess from the plans for implementation.

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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

Competence must be demonstrated in the ability to undertake a structured analysis of the use of utilities and to justify the recommendations for improvement based on the data.

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

- plant data is obtained in a manner which does not interfere with production
- plant drawings (eg, PandIDs) and engineering specifications are interpreted correctly
- health, safety and environmental implications of any changes are identified and addressed, by applying the hierarchy of control, prior to any changes being implemented
- priorities for action consider all relevant factors such as plant key performance indicators, health, safety and environmental implications, simple, quick solutions versus those requiring a capital project, and other relevant business factors.

This will typically be assessed by one or more utilities improvement projects on an operating plant. One complex project, or a number of simple projects, are required to demonstrate competence.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

It may be appropriate to co-assess this unit with

- PMAOPS511A Determine energy transfer loads
- PMAOPS512A Determine mass transfer loads.

However, these are NOT prerequisites or corequisites as there are other ways of obtaining the data.

Essential knowledge

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. It requires the ability to:

- identify all utility consuming items on a schematic of the plant, describe the function of each and the purpose of the utility supplied
- 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).

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	2	3	2	3	3	2

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Unit title

PMAOPS520B Manage utilities

Unit descriptor

In a typical scenario, a senior plant technician manages the use of utilities by all units within the plant as a whole (or a significant plant area) and takes actions which will lead to a more efficient use of these utilities. Utilities is used to mean:

- steam (saturated and/or superheated)
- air (instrument, safety, process and/or mechanical)
- water (cooling and/or process)
- fuel (gas, oil)
- other heating/cooling mediums (oil, 'Dowtherm', brine)
- electricity.

This unit does NOT apply to the routine monitoring of water systems or utilities which are covered by *PMAOPS204A Use utilities and services.*

The plant technician would:

- identify sources and uses of the relevant utilities
- check the efficiency of use of the utility
- take action to increase the efficiency of use of the utility — the action might range from implementing changes to reporting problems and recommendations to coordinating others implementing the changes.

Generally this would be a significant role of a senior plant technician who in the exercise of that role would consult and liaise with a range of other personnel and technical experts, both internally and external to the company, within company guidelines.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
5. Identify source and use of all utilities on plant.	1.1 Obtain current piping diagram 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.
6. 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 by each plant item 2.3 Physically check each item of equipment for signs of inefficient utility use (eg, faulty steam traps, leaks) 2.4 Compile report/database showing actual usage of utilities and observed problems.

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Element	Performance criteria
7. Determine efficiency of use.	3.1 Determine theoretical consumption of utilities for equipment items from engineering specifications, by calculation or other methods 3.2 Compare actual consumption of utilities with theoretical consumption 3.3 Determine inefficient users of utilities 3.4 Compile report/database showing efficiency of use of utilities.
8. Take required action to improve utility efficiency.	4.1 Rank inefficient users in priority order for remediation based on costs and business requirements 4.2 Investigate and determine cause(s) of inefficiency in the higher ranked users 4.3 Develop plans to remove the causes of inefficiency 4.4 Identify any safety, health and environmental (HSE) implications of planned actions and address prior to any implementation of changes 4.5 Consult with relevant stakeholders regarding HSE implications and the implementation of these plans 4.6 Initiate corrective action for items within scope of authority 4.7 Follow through on items to facilitate a timely completion 4.8 Report/make recommendations on required improvements which are beyond scope of authority to action.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which use utilities.

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.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

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 to assess from the plans for implementation.

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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

Competence must be demonstrated in the ability to undertake a structured analysis of the use of utilities and to justify the recommendations for improvement based on the data.

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

- plant data is obtained in a manner which does not interfere with production
- plant drawings (eg, PandIDs) and engineering specifications are interpreted correctly
- health, safety and environmental implications of any changes are identified and addressed, by applying the hierarchy of control, prior to any changes being implemented
- priorities for action consider all relevant factors such as plant key performance indicators, health, safety and environmental implications, simple, quick solutions versus those requiring a capital project, and other relevant business factors.

This will typically be assessed by one or more utilities improvement projects on an operating plant. One complex project, or a number of simple projects, are required to demonstrate competence.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

It may be appropriate to co-assess this unit with

- PMAOPS511A Determine energy transfer loads
- PMAOPS512A Determine mass transfer loads.

However, these are NOT prerequisites or corequisites as there are other ways of obtaining the data.

Essential knowledge

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. It requires the ability to:

- identify all utility consuming items on a schematic of the plant, describe the function of each and the purpose of the utility supplied
- 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).

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	2	3	2	3	3	2

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Unit title

PMAOPS550A Develop a colour formulation

Unit descriptor

This unit covers the development of a new formulation, suitable for production, of a colour to match a sample/customer requirements. It includes both computer and visual colour matching and the adjustment of a computer suggested formulation to suit company conditions and standard materials/colourants.

In a typical scenario, a technologist is given a colour sample, or colour description, and needs to develop a formulation. The formulation would be suitable for production by the company and produce a final product which meets the colour requirements of the customer. The development would include factory trials and modifications to the formulation.. Typically the development will be of a new colour for an existing product of another colour. It may include the colour aspects (only) of developing a totally new product. This unit does not include the development of any aspect of the product other than its colour.

The technologist would:

- identify potential manufacturing problems associated with the colour formulation and propose/implement solutions
- analyse the production trials from the standpoint of the desired colour and the impact of the colour requirements on the production process and make modifications to ensure a product of stable colour and suitable manufacturing process.

Generally the technologist would be part of a team for the total development of a new product, but may develop the colour formulation for a new colour for an existing product independently. The technologist would liaise with relevant production and other personnel for production trials.

Prerequisites

This unit **has** the prerequisites of:

- PMAOPS350A Match and adjust colour
- PMAOPS450A Solve colour problems.

Element	Performance criteria
1. Confirm design brief of new colour.	1.1 Communicate with customer and other key stakeholders and agree: • colour/colour specification • surface finish/gloss • viewing conditions (lighting) • opacity • requirements for metameric/non-metameric match • other aesthetic requirements 1.2 Determine end use of product (eg, interior, exterior, automotive) 1.3 Develop and validate design brief to meet needs.

Element	Performance criteria
2. Determine initial colour formulation.	1.195 Analyse colour sample (where provided) using colour computer and/or eye and predict possible colour formulation 2.3 Compare predicted formulation with company/customer preferred colourants. 2.4 Adjust predicted formulation to use preferred colourants. 2.5 Check that the adjusted formulation complies with design brief.
3. Conduct small scale trials.	3.1 Make/arrange for small batch to adjusted formulation 3.2 Undertake trials to determine optimum processing conditions where relevant 3.3 Analyse colour of sample product and compare to design brief 3.4 Modify formulation and processing (where relevant) to have simplicity of manufacture and to meet brief.
4. Assess hazards.	4.1 Identify hazards arising from colour formulation and processing 4.2 Assess risks arising from those hazards 4.3 Determine appropriate action to control risks in accordance with hierarchy of control and duty of care 4.4 Take required action before proceeding to trial.
5. Trial new colour formulation through the process.	5.1 Design trial to procedure to deliver required information 5.2 Ensure OHS and environmental requirements are stringently observed 5.3 Coordinate the trialing of the new product 5.4 Interpret colour trial results and guide colour trial process 5.5 Adjust formulation, and if appropriate tune process, to optimise production of new colour.
6. Coordinate evaluation and testing.	6.1 Determine colour testing and evaluation regime required to meet end use requirements, including regulatory/industry code requirements 6.2 Arrange for testing and evaluation of trial colour 6.3 Interpret colour trial results 6.4 Modify formulation and conduct new trials as required 6.5 Determine final formulation and processing specifications.
7. Implement procedures for new colour.	7.1 Monitor initial production and adjust process, conditions and formulation to make the process a smooth operation 7.2 Ensure process specifications reflect the optimised operation developed 7.3 Ensure quality standards and procedures meet requirements of design brief 7.4 Ensure procedures are correct for the new colour 7.5 Ensure project records are complete and all required reports have been completed and submitted 7.6 Archive records according to procedure.

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Range of variables

Context

This unit of competency covers the development of a new colour formulation 'from scratch', usually based on a provided colour sample. The formulation would normally use colourants already available within the company (**preferred** colourants), but does not preclude the use of colourants which are novel/new to the company. It may be applied to any industry sector requiring the development of a new colour formulation such as:

- paint
- ink
- plastics
- rubber
- concrete products
- glass products
- clay/ceramic products.

Typical problems may include:

- matching under different lighting conditions
- variable surface finish/gloss level
- non-metameric matching
- process caused colour differences

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.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by developing colour formulations in a plant, laboratory or other relevant context. Assessment will occur over a range of situations which will include different design briefs.

Simulation may be required for assessment of this unit of competency. Simulation should be based on actual colour formulation developments. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what if scenarios.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the predicting possible problems and determining actions required to avoid the difficulty.

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

- predicted colour formulations are reasonable
- adjustments to formulations are made based on a rational interpretation of the results and an understanding of colour and the process

These aspects may be best assessed using a range of colour formulation development projects backed up by scenarios/case studies/what. 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.

Resource implications

Assessment will require a suitable method of gathering evidence of colour formulation ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Competence includes an understanding of colour, the interaction of colourants and the impacts of processing variables on the final colour of then product. In particular it includes the ability where relevant to:

- interpret the 'flare path' on a tonal graph of tone *vs* time
- choose the optimum grind/particle size for the required colour
- balance gloss, opacity and tone
- substitute colourants recommended from a 'computer match' for other colourants
- make both metameric and non-metameric matches
- determine the hazards arising from the colourants chosen
- interpret weathering and other test data relevant to colour and the use of colour
- describe the causes and remedies of common problems such as those selected in the range of variables.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the compressor system and to be able to distinguish between causes of problems such as:

- wrong colourant
- wrong colourant amount
- wrong grind time/particle size
- wrong wetting/dispersing.

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Key competencies

1 Collect, analyse and organise information	2 Communicate ideas and information	3 Plan and organise activities	4 Work with others and in teams	5 Use mathematical ideas and techniques	6 Solve problems	7 Use technology
3	3	3	3	2	3	2

Unit title

PMAOPS600B Modify plant

Unit descriptor

In a typical scenario, it has been identified that modifications need to be made to the plant, and equipment needs to be chosen to undertake these modifications. The identification of the need for modification is not part of this unit, and it may have arisen from any number of possible sources.

This competency does not require the design of equipment (which would typically be an engineering role), but does require the process specification of the equipment and the matching of performance specifications of 'off the shelf' and/or tendered equipment to the required specification. It also requires the selection of the most appropriate item.

This competency assumes that the technician responsible for these modifications takes the overall responsibility for the modifications, but would work with the support of other company and external experts. This extends to the coordination of the installation of the modified equipment. This unit does not cover the optimisation of plant by modification of process, procedures or practice (see *PMAOPS400A Optimise operating systems*) as it is to do with the modification of plant hardware.

This unit does not cover work requiring special certification (eg, registered structural engineer) but may include working with such people and providing process and product expertise.

Prerequisites

This unit has prerequisites of:

- PMAOPS400A Optimise operating systems OR
- PMAOPS401A Trial new process/product

AND

- PMCOPS540A Analyse equipment performance OR
- PMAOPS511A Determine energy transfer loads OR
- PMAOPS512A Determine mass transfer loads.

Element	Performance criteria
1. Confirm required outcomes from modification.	1.1 Communicate with production and engineering managers and other key stakeholders and agree necessary and desirable: • technical requirements • operations requirements • timelines • cost and other requirements 1.196 Determine regulatory/industry code requirements 1.197 Obtain relevant drawings of existing plant 1.198 Develop modification brief, including relevant PandID sketch, to meet needs 1.199 Establish required performance measures to indicate success of project 1.200 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 2.3 Compile a shortlist of modification types/equipment classes which will best meet the modification brief 2.4 Discuss shortlist alternatives with relevant stakeholders and obtain 'sign off' for the chosen approach.
3. Select technically best equipment/unit/modification.	3.1 Complete technical specification for required modification incorporating feedback received 3.2 Compare specification with that of 'off the shelf' equipment where appropriate 3.3 Arrange for equipment suppliers to tender to the specification where necessary, following company procedures 3.4 Rank competing items by their compliance with the technical specification.
4. Compare hazard profile of possible modifications.	4.1 Organise a hazard analysis (eg, HAZOP) for the modification according to company procedures 4.2 Ensure that all stakeholders are represented on the hazard analysis team 4.2 Brief the hazard analysis team on the modification and the alternatives under evaluation 4.3 Eliminate alternatives which do not meet hazard requirements 4.4 Rank remaining competing items by safety performance.

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Element	Performance criteria
5. Make final choice of solution.	5.1 Evaluate competing items by their economic performance (eg, life, maintenance, running costs) and rank by total lifetime cost 5.2 Seek further information where necessary to allow a rational selection to be made 5.3 Choose the modification which meets all required minimum standards and will provide the best solution 5.4 Verify choice in discussion with production and engineering managers and other key stakeholders 5.5 Arrange for order to be placed, following company procedures.
6. Check and commission modification.	6.1 Undertake precommissioning activities 6.2 Complete safety acceptance documentation 6.3 Identify, record and report problems or non-conformances 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.

Range of variables

Context

The need for the modification may arise from a continuous improvement project, as a result of an analysis of plant performance or from any other source. The modification may require the selection of any number of items of equipment such as:

- pumps
- heat exchangers
- mixers
- separators
- columns
- reaction kettles.

Classes of equipment (see element 2) means the selection between different members of an overall class such as:

- heat exchangers — various types of shell and tube, plate, etc
- mixers — propellers, impellors, jet mixing, etc
- packed columns — rings, saddles, etc
- kettles — jacketed, coiled, etc.

- Required minimum standards include:

- OHS legislative requirements related to plant
- Industry and enterprise OHS standards
- Enterprise standards related to maintenance
- Output requirements
- Economic performance

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of this unit of competency as modifications may not occur with sufficient frequency to allow for assessment. Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to specify the requirements and then select the best solution to meet the necessary and desirable requirements.

In particular look to see that:

- safety, technical and economic aspects are all considered
- the decision made can be justified on those criteria
- all key stakeholders are kept well informed and agree with the decisions
- the modification, and particularly its timelines, are a good fit for the overall plant requirements
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

This will typically be assessed by a modification project on an operating plant. One complex project, or a number of simple projects, are required to demonstrate competence.

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Resource implications

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.

Other assessment advice

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:

- PMACOM400A Develop plant documentation
- PMAOHS401A Assess risk.

Essential knowledge

Demonstration of competence in this unit must include knowledge of the following:

- the operations of the plant and each major unit in it
- the principles of operation of the equipment being investigated to the extent required to interpret technical specifications in a meaningful manner
- the basics of plant economics and whole of life costing
- hazard analysis principles (while it is beneficial, it is not expected that the candidate will 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

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	2	3	2	3	3	3

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Support Competencies (400 to 600)

for the

PMA02 Chemical, Hydrocarbons and Oil Refining Training Package

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Unit title

PMAOHS400B Contribute to workplace OHS management system

Unit descriptor

On completion of this unit, the worker will be able to contribute to the workplace occupational health and safety management system and ensure that the workplace is, so far as is practicable, safe and without risks to the health of workers.

Prerequisites

This unit **has** the prerequisite of:

- PMAOHS300A Implement and monitor OHS policies and procedures for a work group.

Element	Performance criteria
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 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.

Element	Performance criteria
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 records.

Range of variables

Context

This competency unit covers live, real time and ongoing routine hazard identification and risk assessment.

This unit of competency describes OHS requirements applicable for those with responsibilities for contributing to the workplace occupational health and safety 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 enterprise to enterprise.

Review of activities may include review of written reports, performance appraisal or auditing procedures.

Competence is demonstrated in the context of an enterprise 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.

This competency covers process manufacturing plants which may involve workplace hazards such as:

- chemicals and hazardous materials
- gases and liquids under pressure
- moving machinery
- materials handling working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours.

Sources of relevant OHS information include:

- external
  - OHS legislation and codes of practice
  - industry standards for materials, process, equipment etc
  - NOHSC/SA/ISO standards
  - OHS authorities eg WorkCover
  - unions and industry associations
  - internet, journals, magazines
  - manufacturer's/suppliers manuals/specifications
- internal
  - policies and procedures
  - JSA, risk assessments, HAZOPs
  - hazard, incident and injury records
  - training resources

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- employee information brochures, newsletters etc
- OHS reports such as inspections, technical reports.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency. 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

It is essential that the workplace OHS system and State OHS regulations be understood and that the importance of critical procedures is known. Competence must be demonstrated in the ability to recognise and analyse potential situations that require action and then in implementing appropriate corrective action. There should be an underpinning understanding of the duty of care responsibilities of employer and employees.

Consistent performance should be demonstrated. In particular look to see that the required level includes a working knowledge of all relevant workplace procedures. Look to see knowledge and understanding of:

- the requirements that the workplace procedures should meet
- the consultation processes, either general or specific to occupational health and safety
- 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 occupational health and safety information
- occupational health and safety 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 plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Resource implications

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

Other assessment advice

It is expected that this competency may be applicable in combination with other industry, occupation or workplace-specific competencies. In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Knowledge and understanding of the workplace OHS system and State OHS regulations, 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:
  - 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
  - the hierarchy of control
- access and use current OHSMS
- access and interpret training records
- identify and communicate with all key personnel in the organisation
- identify and access relevant sources of information.

A knowledge of related management systems eg purchasing and IT is required.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	3	3	3

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Unit title

PMAOHS401B Assess risk

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. 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.

In a typical scenario the worker will 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.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
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 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.

Element	Performance criteria
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.

Range of variables

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.

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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, 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.

This competency covers process manufacturing plants which may involve workplace hazards such as:

- chemicals and hazardous materials (short term and long term effects)
- 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.

Hazardous events may include:

- incidents with a potential for injury
- fires, explosions
- chemical spills
- bomb scares.

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
- shutdown
- composition
- phase
- level
- corrosion
- erosion
- services
- utilities
- maintenance/maintain
- inserting
- purging
- contamination
- separate (settle, filter, centrifuge)
- mix
- drain.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the

assessment of other relevant units of competency. Assessment will occur over a range of situations that will include disruptions to normal, smooth operation.

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

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

Critical aspects

It is essential that the workplace systems and the importance of critical procedures are known.

Consistent performance should be demonstrated. In particular look to see that the required level includes a working knowledge of all relevant workplace procedures. Look to see that the technique used:

- enables identification of hazards and how hazard controls may break down
- enhances the understanding risks and it may be reduced
- permits the modeling and evaluation of a wide range of failure modes
- enables the analysis to be carried out in a manner that is auditable, repeatable and verifiable
- is usable by other staff
- is appropriate to the system operating in the given domain
- gives valid results from data of the quality and quantity actually available
- is appropriate for the particular lifecycle phase at which it is to be applied
- provides standard proformas to support the technique
- has a rational technical basis which may include reference to national or international standards, defense standards or published reference books.

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, past hazard analysis activities and similar sources.

Resource implications

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

Other assessment advice

It is expected that this competency may be applicable in combination with other industry, occupation or workplace-specific competencies. In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

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Essential knowledge

Knowledge and understanding of the workplace systems, machinery, equipment, operations, products and materials, and standard operating procedures sufficient to contribute to the recognition and analysis of potential situations requiring action and then in suggesting suitable, appropriate corrective actions within the range of their responsibilities and competencies.

The knowledge of hazards as sources of energy, the ability to differentiate between a hazard and risk and an understanding of the concept of risk as a measure of uncertainty are important underpinning knowledge for this competency.

Competence includes the ability to:

- apply and describe:
  - relevant OHS legislation related to risk assessment including documentation and retention of risk assessment documentation
  - sources of information for hazard analysis
  - identification of hazards and operability problems in the workplace
  - assessment of the level of risk
  - the development of a risk register
  - locate and understand workplace OHS procedures
  - locate and understand standard operating procedures (SOPs) within the range of responsibilities
  - locate manufacturers' design and specification details of machinery, equipment, products and materials within the range of responsibilities.
- apply and explain:
  - management systems and procedures for occupational health and safety
  - how other functional areas (purchasing, contractor management, maintenance, HR, IT etc) may impact on the OHS management system

  the hierarchy of control.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	3	3	3

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Unit title

PMAOHS410B Manage emergency incidents

Unit descriptor

In a typical scenario the person in charge of a facility undertakes the management, coordination and response to emergency situations within the facility. Typical facilities could include:

- onshore/offshore installation/rig
- floating hydrocarbons production vessel
- onshore hydrocarbons production, processing and/or storage facilities
- pipeline and related facilities
- chemicals manufacturing plant.

The person would:

- assess the magnitude and impact of the emergency
- gather and coordinate all of the necessary emergency response personnel and equipment and direct their implementation
- initiate all of the necessary communication responses, both within and outside the facility
- manage and coordinate the emergency response.

This unit of competency applies to persons who would normally be in control or command of the facility or be required to deputise in this role. They may be expected to be capable of performing all parts of this unit.

Prerequisites

This unit **has** prerequisites of.

- PMAOHS212A Undertake first response to fire incidents.

Element	Performance criteria
1. Collect and assess emergency information.	1.7 Ascertain the scope and severity of the emergency as quickly as possible, from information received from alarms, personnel and other means 1.8 Collate and assess information on emergency 1.9 Develop appropriate responses to the information received based on emergency response planning.
2. Implement emergency response strategies.	2.1 Develop, or promptly implement, onsite strategies in order to combat the emergency 2.2 Monitor continuously information flows relating to the emergency in order to evaluate the effectiveness of the implemented strategy 2.3 Coordinate team activities and resource allocation and direct them to meet the identified emergency 2.4 Delegate authority to appropriate personnel as the situation warrants.

Element	Performance criteria
3. Liaise with emergency control.	3.1 Collate and communicate information relating to the emergency to emergency control centre 3.2 Request external assistance as appropriate 3.3 Coordinate/incorporate external assistance into emergency response 3.4 Control internal and external communication in accordance with the emergency response plan.
4. Coordinate emergency responses.	4.1 Convey feedback relating to progress/status of the emergency to emergency response teams and other personnel 4.2 Regularly reassess and modify responses and tactics in accordance with the status of the emergency.
5. Assess emergency response/actions.	5.1 Collated and assess information on status of emergency to enable a final decision to be made and communicated to declare the end of the emergency, or abandonment of the facility.
6. Undertake post-emergency evaluation.	6.1 Undertake a post-response evaluation of the emergency in order to determine the effectiveness of the response strategies and the emergency response plan 6.2 Recommend and communicate modification and adjustments to the emergency response plans to appropriate personnel 6.3 Review and modify planning of emergency response exercises and training in light of the outcomes of the emergency response evaluation.

Range of variables

Context

Site specific response plans must be adhered to.

Systems and resources include:

- emergency repair equipment and tools (including pipeline repair equipment)
- emergency response systems
- emergency communication systems
- work management systems
- installation facility and operational layout
- safety case or hazard control plan management systems.

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External services and third parties may include:

- fire brigade
- police
- ambulance
- air traffic control
- emergency services
- relevant State or Federal government agency
- local councils
- shippers and customers.

Environmental legislative requirements must be adhered to.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of all parts of this unit of competency (elements 1 to 6 inclusive). Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role-plays. Simulations of the operation and control of emergency resources, tools and equipment must be made using resources available in the facility.

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

Critical aspects

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:

- the situation is rapidly assessed and all information available processed quickly
- communication of the status and requirements are made to the relevant parties
- resources are coordinated in an effective manner
- full use of available internal and external resources is made.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures.

Essential knowledge

A person undertaking this competency must be able to demonstrate a knowledge of the following:

- use and selection of personal protection equipment
- fire control and attack techniques and strategies
- fire and product leak control and containment techniques and strategies
- characteristics of the plant, equipment and facility and associated facilities emergency situations
- selection and application of appropriate fire extinguishing media
- characteristics of fires and fuel types
- principles and procedures of SCBA
- self rescue techniques
- search and rescue techniques (other than self)
- casualty handling techniques
- relevant facility fire management and safety systems
- emergency communication systems
- emergency response plans
- teamwork principles and techniques
- control and leadership principles and techniques.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	1	3	2

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Unit title

PMAOHS420A Develop first aid procedures and manage resources

Unit descriptor

This competency unit encompasses the management of procedure development and the implementation of effective systems for human and physical resources to ensure that first aid can be effectively and efficiently provided in the workplace.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Coordinate and implement effective organizational systems.	1.1 Coordinate participative processes to identify and agree on outcomes 1.2 Initiate processes to plan, implement and control systems to achieve identified outcomes 1.3 Implement/develop policies and procedures to give effect to workplace health and safety legislation, site procedures, Training Package requirements and national training agenda 1.4 Develop processes in accordance with workplace principles and relevant legislation, and maintain for succession of first aid responsibilities 1.5 Distribute changes in policy and procedures to relevant personnel using appropriate communication channels 1.6 Undertake review and recommendations of procedures/policy and reported when required.
2. Implement effective first aid training and practice.	2.1 Maintain links with first aid bodies and professionals and clinical organisations/bodies 2.2 Maintain currency of first aid and personal qualifications in accordance with industry and organisational requirements 2.3 Review and validate risks against organisational policies and procedures and other standards so that effective risk control procedures can be applied 2.4 Coordinate, plan, implement and evaluate additional training in a timely manner to meet the needs of individuals and the work site 2.5 Ensure practices are consistent with current standards and policies 2.6 Coordinate planning for response to major incidents and make known to the work group in readiness for implementation.

Element	Performance criteria
3. Maintain up-to-date professional development of knowledge and skills.	3.1 Undertake self education process in accordance with workplace principles and opportunities 3.2 Access links with various professional first aid bodies and organisations to maintain currency in the field 3.3 Access relevant information promptly and make known to work group, and maintain certification in accordance with workplace procedures and legislation.

Range of variables

Context

Systems may include:

- ordering (eg, magazines, books)
- skills updating (eg, attending conferences/workshops, reading publications)
- networking
- communication
- technological
- training and assessment.

Access relevant information may include:

- meetings
- seminars
- log books (personal development)
- conferences
- alignment with professional first aid bodies.

First aid bodies and professional and clinical organisations/bodies could include:

- Australian Resuscitation Council (ARC)
- International Liaison Committee on Resuscitation (ILCOR)
- support groups
- registered providers/authorities.

Policies and procedures may be from organisations such as:

- Australian Resuscitation Council (ARC)
- National Health and Medical Research Council
- Australian standards
- company Standard Operating Procedures (SOPs)
- risk management standards.

Self education processes may include:

- attendance at relevant seminars and conferences
- maintenance of professional library
- membership of other first aid bodies
- formal training
- supervised or unsupervised practice to maintain currency of competence.

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Evidence guide

Assessment context and methods

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

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

Where applicable, assessment should replicate workplace conditions as far as possible. Where, for reasons of safety, access to equipment and resources and space, assessment takes place away from the workplace, simulations should be used to represent workplace conditions as closely as possible.

Critical aspects

Competence may be demonstrated working individually, under supervision or as part of a first aid team.

Resource implications

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.

Other assessment advice

Competence may be assessed in conjunction with other industry units of competency such as:

- PMAOHS600A Ensure a safe workplace
- workplace training
- frontline management or similar units.

Essential knowledge

Knowledge and understanding of policy development and systems for human and physical resources sufficient to ensure that first aid can be effectively and efficiently provided in the workplace.

Underpinning knowledge and skills:

- national training agenda
- use of referral network
- legal requirements
- duty of care
- State and Territory regulations relating to currency of skills and knowledge
- training and assessment
- communication techniques
- first aid principles and practices.

Key competencies

1 Collect, analyse and organise information	2 Communicate ideas and information	3 Plan and organise activities	4 Work with others and in teams	5 Use mathematical ideas and techniques	6 Solve problems	7 Use technology
3	3	3	2	2	3	2

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Unit title

PMAOMIR407A Audit incident preparedness and established response systems

Unit descriptor

This unit covers the competency to assess the extent to which a facility is prepared to respond to an incident. This could apply to all of the realistically potential incidents which might occur to an organisation including those under its safety case. The person undertaking the audit would typically respond to the incident manager.

In a typical scenario the person would undertake an analysis of existing incident preparedness and response systems as part of a continuous improvement process or spot check. Part of the audit may involve the conducting of an unscheduled incident response drill, analysing the results and providing a thorough debrief of the persons involved. The person then may make recommendations for changes to the system

Key aspects of the competency include:

- thorough examination of each of the various systems in place
- identifying key areas where systems overlap or system breakdowns occur
- ensuring that the established systems are working in accordance to the incident response plan and legislative requirements

The person may:

- communicate extensively within and outside the organisation
- review and audit practices and processes relevant to incident response
- identify and as necessary reinforce system benchmarks
- provide input towards system continuous enhancement.
- conduct and assess incident exercises as required.

Generally the person would be an incident coordinator, manager or technical specialist and be part of an incident response team during the incident. They may have an ongoing role for managing incident information and/or the incident information system.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Benchmarks for audit are clearly identified	1.1. Access, interpret and clarify the legislative, statutory and site requirements relating incident preparedness and response systems 1.2. Access and review relevant documentations of the plan and established management systems 1.3. Conduct consultations with stakeholders and specialist as necessary

Element	Performance criteria
2. Plan, organise and undertake audit of the established incident response systems	2.1. Identify or develop methods to audit the established management systems and processes as prescribed by the plan and/or legislation in consultation with relevant personnel 2.2. Identify and secure the resources required to conduct the audit 2.3. Gather and sight relevant documents and all other evidence required in accordance with procedures 2.4. Conduct the audit according to prescribed/pre-agreed methodology and in a manner that enhances the organisation's confidence and commitment to the incident response system
3. Evaluate and report the results of the audit	3.1. Evaluate evidence gathered for reliability, validity, authenticity, sufficiency, currency and consistency 3.2. Promptly bring to the attention of relevant personnel any findings which have serious or immediate risks 3.3. Disseminate records of the process and outcomes of the audit, including justifiable recommendations complying with procedures, to appropriate personnel in a timely manner
4. Follow up results of the audit	4.1. Discuss and confirm results with relevant personnel and provide feedback including advice on corrective actions 4.2. Follow up corrective actions relating to deficiencies until resolution has been achieved

Range of variables

Context

Management systems include (but are not limited to):

- evacuation
- emergency operations structure
- communications
- information management
- documentation and reporting requirements
- resource management
- training
- audit and review system
- financial management

Documents and evidence may include:

- electronic databases
- videos
- photographs
- written information/records
- training and learning programs

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,

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and must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of ‘what if’ scenarios both in the facility (during demonstration of normal operations and walk throughs of abnormal operations) and off the site.

Critical aspects

Consistent performance should be demonstrated. In particular look to see that competence in this unit reflects successful assessment in the critical aspects of:

- safe conduct of audit and review
- identification of benchmarks for audit and review
- development of methodologies for effective audit and review
- compliance with prescribed methodologies for audit and review
- evaluation of documents and evidence
- demonstrated understanding of the value of accuracy, attention to detail and impartiality
- information gathering, analysis and communication

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the

plant, incidents on similar plants around the world, hazard analysis activities and similar sources.

Resource implications

Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.

Other assessment advice

It may be appropriate to assess this unit concurrently with other relevant units.

Essential knowledge

The knowledge referred to in the evidence guide for this Unit includes:

- relevant legislation
- relevant company policy management systems/procedures relating to incident preparedness and response
- company requirements in relation to audit and review procedures
- hazard identification and control
- occupational health and safety requirements
- risk management principles and techniques
- incident containment tactics

Competence also includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- audit methods fail to provide sufficient qualitative and quantitative data
- audits fail to identify key system failures
- actions arising from audits do not translate into improvements in the system
- relationships between incident response partner organisations do not function as intended

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	1	3	2

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Unit title

PMAOMIR418A Coordinate incident response

Unit descriptor

This unit covers the coordination of the response to off-shore or on-shore incidents. The person may be the incident coordinator, or could be a member of the incident control centre team. The incident coordinator typically responds to the incident manager, who may be stationed away from the facility or plant.

In a typical scenario, the person is in charge of an incident control centre on or near the facility. The incident coordinator is responsible for interactions between corporate headquarters, the on site incident response teams and the person in charge of the facility. There may be more than one incident response team involved depending on the size and complexity of the incident.

Key aspects of the competence include:

- minimising the escalation of the incident
- allocation of resources and assets
- tactical response planning, consistent with the philosophies and strategies of the organisation
- close communication with the incident response team(s)
- interactions with external agencies required to assist with the emergency
- gathering information concerning the incident

The individual may:

- effectively communicate and consult with a range of individuals and organisations
- develop incident response and/or incident search and rescue tactics based on information available
- negotiate and communicate with internal support structures set up to assist with logistics planning, operations and external affairs

Generally the individual would assume command of the incident response team(s) during an incident response though may be required to take advice from the incident support management group. At all times they would be liaising and cooperating with members of the incident support management group.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Assess the situation and determine priorities	1.1. Seek incident information from appropriate on-site personnel 1.2. Monitor changes in the nature, extent and potential implications of the incident 1.3. Develop an incident response tactics based on analysis of the situation and consistent with the philosophies and strategies of the organisation 1.4. Identify required resources in accordance with the tactics developed 1.5. Continually review objectives in light of information updates, reports and feedback
2. Manage incident control centre	2.1. Brief incident control centre personnel on the scenario and tactics, their roles and responsibilities and of the way the centre will operate 2.2. Allocate tasks to incident control centre personnel commensurate with their roles and level of competence 2.3. Monitor performance of incident control centre personnel and review as the incident unfolds to determine ongoing requirements
3. Liaise with internal management and support structures	3.1. Regularly brief and provide communications to appropriate personnel in accordance with procedures 3.2. Monitor and review resources to determine changing requirements in accordance with changing circumstances 3.3. Ensure resources are available as required 3.4. Provide or obtain guidance and support to/from management and support structures.
4. Ensure communications systems are effective	4.1. Establish communications with personnel at the incident scene 4.2. Establish communications with other personnel on or off-site as required 4.3. Ensure communications systems are managed to provide optimum capability.
5. Conclude and review incident activities	5.1. Account for all personnel and other resources 5.2. Conduct a debrief and complete company incident reports 5.3. Evaluate and review tactics and procedures 5.4. Evaluate and document effectiveness of the control function and its interaction with command organisations 5.5. Communicate reports in accordance with company procedures

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Range of variables

Context

This unit of competency covers incidents that may include:

- fire, explosion
- loss of containment (eg. gas leaks, spills)
- damage to facilities (eg. accidents, crashes, aircraft)
- natural disasters (eg. cyclones, wind, rain, earthquake, flood)
- other (eg riot, civil unrest, terrorism)

It includes all such items of equipment and unit operations that form part of the incident response system, and may include:

- schematics, designs, detail drawings, maps/charts
- data systems, computers systems, electronic aids
- manuals, designs, operation procedures and instructions
- emergency vehicles or equipment
- vessels and aircraft

Incident response may include:

- search and rescue operations
- engagement of emergency services (fire, ambulance, rescue, military)
- liaison with other agencies (environmental, clean-up, specialised troubleshooters)

Typical problems for your facility may include:

- communications problems
- inappropriate information
- confusion over roles and responsibilities
- lack of cooperation
- inappropriate location of command post in relation to incident

HSE

All operations to which this unit applies are subject to stringent Health, Safety and Environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident.

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

- incident responses are in accordance with company procedures
- correct incident response equipment (where required) is used appropriately
- the safety and/or successful recovery of personnel and others affected by the incident response is afforded priority in the actions taken
- actions taken do not inhibit incident response effectiveness or further contribute to the incident
- appropriate documentation including reports, journal entries, logs and/or clearances are completed in accordance with procedures

These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

Resource implications

Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all workplace environments it may be appropriate to assess this unit concurrently with relevant units.

- PMAOMIR344 Develop Incident control strategies

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- PMAOMIR307 Audit incident response system
- PMAOMIR430 Conduct and assess exercises

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- incident management techniques
- operational duration of essential equipment
- legislative and regulatory requirements
- coaching and team building concepts
- the organisation's policies and procedures protocols
- how to communicate effectively under stress

Competence also includes the ability to isolate the causes of issues within the incident response system and to be able to distinguish between causes of issues indicated by:

- incorrectly determining the range and performance of resources required to address the incident
- inappropriate resources being assigned to the incident response operation
- failure of communications systems within the command post
- overestimating the capabilities and competence levels of personnel

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	2	2	2

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Unit title

PMAOMIR424A Develop and maintain community relationships

Unit descriptor

This unit covers the establishment of workable arrangements which engage and inform the community about aspects of the plant's operations and incident response systems. This could apply to information about the products the operation produces, critical events on the organisation's calendar such as incident response practices and means by which the community would be kept informed during an incident.

In a typical scenario the person is a member of the incident room team and is designated with the task of ensuring the preparedness of the communities surrounding and/or affected by the facility to respond to an incident. For example the organisation is preparing to shut down part of the plant for routine maintenance and as part of that process some of the gas will be flared off. This will create a spectacular plume over the plant but because the community is alerted to both timing and what to expect, community panic and concern is limited.

Key aspects of the competency include:

- gathering and disseminating key information to the community
- identifying key organisations in the community with which communication links need to be established
- establishing inclusive strategies concerning both routine and non-routine events.

This person would:

- establish networks within the community
- design and conduct public safety awareness activities that will establish community preparedness by enhancing awareness

While independent action may sometime be required, the person is expected to liaise, cooperate and consult with other members of the incident management team as necessary.

Prerequisites

This unit **has no** pre-requisites.

Element	Performance criteria
1. Identify information that needs to be disseminated to the community	1.1. Access and examine incident response plans 1.2. Conduct consultations with appropriate personnel as necessary
2. Establish networks within the community	2.1. Identify stakeholders within the community 2.2. Initiate contact with key community stakeholders 2.3. Establish and maintain rapport 2.4. Enlist cooperation and support in organising and conducting public safety awareness activities

Element	Performance criteria
3. Design and conduct public safety awareness activities	3.1. Develop a plan in consultation with stakeholders and appropriate personnel 3.2. Design activities to support the plan in consultation with stakeholders and appropriate personnel 3.3. Clearly identify measures for assessing the outcome of activities 3.4. Develop and distribute marketing materials and educational materials/resources appropriate to the context, issue and audience 3.5. Identify and secure other resources required 3.6. Develop and implement strategies for delivery of the project to ensure maximum effectiveness 3.7. Make adjustments as required to meet the needs of specific groups
4. Evaluate activities	4.1. Assess activity outcome against the planned goals/objectives and measures 4.2. Complete reports detailing activities, results and recommendations according to procedures

Range of variables

Context

Public safety awareness activities may include:

- distribution of educational materials/resources
- use of media to disseminate information
- public educational presentations
- conduct of or attendance in community meetings/forums
- incident exercises

Relevant information may include:

- incident response plan and management systems in place to prevent an incident
- warning signals in the event of an incident
- procedures to be followed in the event of an incident relating to evacuation and welfare operations
- appropriate people to contact and contact details
- post-incident management systems

HSE

All operations to which this unit applies are subject to stringent Health, Safety and Environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation.

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In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of ‘what if’ scenarios both in the facility (during demonstration of normal operations and walk throughs of abnormal operations) and off the site.

Critical aspects

Consistent performance should be demonstrated. In particular look to see that competence in this unit reflects successful assessment in the critical aspects of:

- identification of networks critical to the development and implementation of public safety awareness activities
- design, conduct and evaluation of public safety awareness activities
- effective communication skills

These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

Resource implications

Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.

Other assessment advice

It may be appropriate to assess this unit concurrently with other relevant units.

Essential knowledge

The knowledge referred to in the evidence guide for this Unit includes:

- relevant legislation
- incident response plans and management systems (particularly warning signals and evacuation procedures)
- promotional techniques and methods
- group dynamics
- a range of presentation strategies and techniques
- protocols and procedures
- relevant organisational policies

Competence also includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- expressions of community concern about a lack of communication with the organisation
- an atmosphere of mistrust existing between the community and the organisation
- constant referrals of organisational activities to local, State or Commonwealth authorities
- the volume of requests for information received from community groups or individuals
- protest meetings or rallies by concerned residents

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	1	2	2

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Unit title

PMAOMIR430A Conduct and assess incident exercises

Unit descriptor

This unit addresses the competence required to conduct and assess incident exercises. The person would be engaged in the construction of scenarios that approximate incident situations and exercises in dealing with those incidents.

In a typical scenario the person would be a member of the incident room team and would be responsible for ensuring that both scheduled and unscheduled incident exercises took place. Results of these exercises would provide essential input into the audit and evaluation of incident preparedness of the facility. However, a proper post-exercise debrief is critical, as the exercise likewise has a strong educative value that promotes awareness and understanding among participants.

Key aspects of the competence include:

- establishing key objectives and strategic outcomes from incident exercises
- improving the organisation's level of preparedness should an incident occur
- improving the ability of personnel to respond appropriately and safely during an incident

The person may:

- communicate extensively both inside and outside the organisation
- establish and support mechanisms for the design and conducting of incident exercises
- review and evaluate the soundness of incident response plans and management systems.

Generally the person would be an incident coordinator, manager or technical specialist and be part of an incident response team during the incident. They may have an ongoing role for managing the training and incident exercise system.

Prerequisites

This unit **has no** pre-requisites.

Element	Performance criteria
1. Determine objectives	1.1. Identify the need for the incident exercise in consultation with stakeholders 1.2. Determine the objectives of the exercise which meet the identified need

Element	Performance criteria
2. Design exercise	2.1. Select the exercise style, consistent with the objectives, in consultation with stakeholders 2.2. Design the exercise to ensure that objectives are met and address health, safety and environment issues 2.3. Identify and secure the resources to support the exercise 2.4. Distribute the exercise plan stating the objectives to appropriate personnel
3. Manage exercise	3.1. Brief personnel involved in the exercise in respect of aims, objectives, expectations and activity outcomes 3.2. Use the exercise plan to initiate and facilitate the conduct and direction of the exercise 3.3. Conduct the exercise in a manner that addresses health, safety and environment issues 3.4. Monitor the progress of the exercise and provide feedback to personnel
4. Evaluate outcomes	4.1. Plan a post exercise debrief based on the conduct and outcomes of the exercise 4.2. Conduct a debrief with activity personnel 4.3. Review outcomes of the activities against objectives 4.4. Prepare and distribute a report of the activity to stakeholders

Range of variables

Context

Types of exercise may include:

- scenario analyses
- case studies
- role plays
- discussion exercises / desktop exercises
- functional centre exercises (specific task environments within the workplace)
- field exercises
- synthetic training
- high level architecture
- multimedia
- virtual reality
- distributed interactive software

The design process may include:

- determination of activity management structure
- development of documentation
- design of activity
- issuing notifications
- briefings and debriefings

Activity personnel refers to people who assist in the conduct of the incident exercise and may include:

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- activity director
- directing staff/coordinators/facilitators
- safety officers
- assessors/umpires
- public relations staff
- casualty simulators
- role player liaison officers
- administrative/welfare personnel to support learning and assessment tools

Activity documentation may include:

- activity notification
- activity management checklists
- general instructions
- safety instructions
- timetable/schedule of events, exercise plan
- activity inputs

HSE

All operations to which this unit applies are subject to stringent Health, Safety and Environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

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

Critical aspects

Consistent performance should be demonstrated. In particular look to see that competence in this unit reflects successful assessment in the critical aspects of:

- clearly identifying the need for the exercise
- planning, conduct and evaluation of exercise
- hazard identification and control
- demonstrated understanding and ability to address health, safety and environment issues
- briefing and debriefing

These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

Resource implications

Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.

Other assessment advice

It may be appropriate to assess this unit concurrently with other relevant units.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- legislative and regulatory arrangements relating to incident management
- incident response plan and management systems
- incident management concepts and principles
- adult learning principles
- relevant networks
- problem solving and decision making techniques
- assessment and review techniques
- project management principles

Competence also includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- exercises are not conducted according to expectations
- unintended or inappropriate exercise outcomes
- mismatches between equipment and incident requirements
- lack of appropriate feedback at the conclusion of training exercises
- an injury occurs during the conducting of the training exercise

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Key competencies

1 Collect, analyse and organise information	2 Communicate ideas and information	3 Plan and organise activities	4 Work with others and in teams	5 Use mathematical ideas and techniques	6 Solve problems	7 Use technology
3	3	3	3	1	3	1

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Unit title

PMAOMIR444A Develop incident containment tactics

Unit descriptor

This unit covers the competency required in the development of tactics that are to be used in the containment of incidents in on-shore and off-shore facilities. The person would typically be an incident coordinator who would respond to the incident manager.

In a typical scenario the person must ensure that the tactics proposed to be employed in response to an incident are appropriate to the circumstances and that actions taken in changing circumstances are effective in dealing with the incident. For instance the options available to incident response teams may be limited and include the need to follow specific procedures or sequences of events. In such a situation the organisation may need clearly defined procedures to ensure that all levels of incident response are aware of how the incident is to be confronted.

Key aspects of this competency include:

- forming clear and unambiguous views about the nature of the potential incident
- evaluating and prioritising alternative tactics
- analysing and interpreting information for trends and impacts
- forwarding key information to those who require it

The person may:

- undertake critical analysis and problem solving
- examine specific scenarios and develop tactics to physically contain those events
- evaluate alternative tactics
- recommend the most appropriate strategy
- document strategies

Generally the person would be an incident coordinator, manager or technical specialist and be part of an incident response team during the incident. They may have an ongoing role for managing incident information and/or the incident information system.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Identify incident containment tactics	1.1. Identify risk characteristics of the possible incident scenarios 1.2. Identify specific objectives of incident containment 1.3. Identify existing tactics 1.4. Develop a range of alternative tactics

Element	Performance criteria
2. Evaluate tactics	2.1. Predict incident behaviour and growth under alternative strategy scenarios 2.2. Consider issues relating to health, safety and environment 2.3. Identify and secure resource requirements for alternative tactics 2.4. Identify the impact of tactics on a range of factors 2.5. Identify and clearly document tactics 2.6. Obtain, collate and record feedback on tactics from stakeholders and incident managers and ensure this is reflected into the documentation according to procedures 2.7. Negotiate stakeholder needs and address
3. Select tactics	3.1. Document findings and feedback on the suitability of different tactics 3.2. Recommend preferred tactics according to procedures 3.3. Document tactics and build into strategies and training doctrines
4. Adopt strategies	4.1. Incorporate documentation on selected tactics into the appropriate incident management manuals 4.2. Notify stakeholders of new tactics 4.3. Incorporate selected tactics into incident training exercises

Range of variables

Context

Incidents may include:

- fire
- explosion
- gas or oil leak
- accident
- bomb threat
- missing personnel
- combination of the above

Tactics are identified through:

- consultation with experts
- literature review

Stakeholders may include:

- shareholders
- board of directors
- employees
- unions
- contractors
- suppliers

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- insurance companies
- local community
- fire brigade
- police
- local emergency management organisations
- medical services
- relevant public authority

HSE

All operations to which this unit applies are subject to stringent Health, Safety and Environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of ‘what if’ scenarios both in the facility (during demonstration of normal operations and walk throughs of abnormal operations) and off the site.

Critical aspects

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

The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident.

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

- understanding of incident containment tactics is demonstrated
- understanding of the regulatory environment in which actions need to take place is explained
- the impact of the incident on environment, local community and economy of the organisation is understood
- tactics are evaluated with consideration given to advantages and disadvantages
- Hazard risk identification and control is demonstrated
- Information gathering, analysis and communication are demonstrated to the required level
- relevant personnel and experts/specialists with whom consultation must take place are identified

These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

Resource implications

Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.

Other assessment advice

It may be appropriate to assess this unit concurrently with other relevant units.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- different types of incidents and risks
- incident prediction
- equipment required
- rescue techniques
- intervention and control techniques for heating, fires and explosions
- incident resources and how to access them
- incident response and disaster planning processes and techniques
- relevant legislation
- hazard identification and control
- risk management principles and techniques
- structure, roles, capabilities and operational limitations of external resources and agencies
- insurance policies and considerations
- economic impact and considerations

Competence also includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

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- tactics fail to achieve the desired outcomes
- input to tactic development is limited or of less value than expected
- tactics when exercised show gaps or limitations in effectiveness
- adoption of tactics proves problematic or resistance is encountered
- incident containment proves to be of limited success

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	2	2	2	1	3	3

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Unit title

PMAOMIR449A Monitor legal compliance obligations during incidents

Unit descriptor

In a typical scenario, a person oversights the operations of an incident or a crisis management team to preclude possible breaches of legislation and regulations during incidents on sites administered by the organisation and advises on compliance issues. Typically this person may be a company legal officer, environmental officer or a site/facility safety officer. Such incidents might include:

- loss of containment such as spills or gas/vapour release
- fire
- environmental incident or damage occurring through actions taken to resolve an incident
- catastrophic failure of plant, assets or equipment
- loss of life or occurrence of serious injury

The individual would:

- advise the management team concerning potential breaches of legislation
- monitor the organisations efforts during recovery to maintain compliance
- negotiate controls for restoration and clean up activities or other actions
- submit organisational reports and prepare for legal proceedings

Generally the individual would be part of a crisis management team during any incident however may work independently in some circumstances. At all times they would be liaising and cooperating with other members of the crisis management team.

Prerequisites

This unit **has no** prerequisites:

Element	Performance criteria
1. Review incident response plans	1.1. Identify legislation and regulations relevant to possible incident scenarios 1.2. Determine possible compliance issues with planned responses 1.3. Negotiate alternative response plans which do not raise compliance issues 1.4. Ensure plans, equipment and training are modified to reflect changed response plans.

Element	Performance criteria
2. Oversee the operations of the incident management team	2.1. Ensure that the incident team is aware of legislation that needs to be complied with during the incident 2.2. Obtain information concerning legal ramifications as required in accordance with organisation's policies 2.3. Ensure accurate recording of all relevant details of all agreed actions 2.4. Assess actions taken and proposed against relevant legislation to determine compliance and possible impacts on the company
3. Advise appropriate action to facilitate compliance	3.1. Undertake consultations with regulatory authorities to facilitate minimal impact resolutions 3.2. Advise management of options that are available to remain compliant 3.3. Provide advice on actions to achieve compliance
4. Monitor actions taken to achieve compliance	4.1. Monitor company actions to resolve incidents and achieve compliance or remain compliant 4.2. Document actions taken by the organisation to remain compliant 4.3. Prepare reports for management regarding outcomes from the incident and any material breaches of legislation that have occurred 4.4. Prepare for possible legal proceedings within required timeframe
5. Seek improvements to incident responses	5.1. Identify possible areas for improvement 5.2. Develop improved responses in liaison with relevant people 5.3. Ensure plans, equipment and training are modified to reflect improved response plans.

Range of variables

Context

This unit of competency includes all such items of equipment and unit operations which form part of the incident response system. In your facility this may include (select relevant items):

- computers
- recording equipment
- legislation and regulations

Typical problems for your facility may include:

- difficulties tracking and identifying relevant legislation or amendments
- managing evidence for later investigations or enquiries
- interpersonal conflicts
- conflicts of interest

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,

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and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of ‘what if’ scenarios both in the facility (during demonstration of normal operations and walk throughs of abnormal operations) and off the site.

Critical aspects

Competence must be demonstrated in the ability to correctly respond to incident situations and in implementing appropriate action. The emphasis should be on the ability to stay ahead of the problem rather than to have to take drastic action in order to recover the situation. In particular look to see that:

- incident response plans are compliant and training and procedures reflect those plans
- incidents are monitored and advise obtained where required and given to minimise/ prevent non-compliance
- the safety and/or successful recovery of the individual and others affected by the incident response is afforded priority in the actions taken
- actions taken do not inhibit incident response effectiveness or further contribute to the incident

- appropriate documentation including reports, journal entries, logs and/or clearances are completed in accordance with procedures

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

Resource implications

Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations.

A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all workplace environments it may be appropriate to assess this unit concurrently with relevant units such as:

Essential knowledge

The knowledge referred to in the evidence guide for this Unit includes:

- relevant legislation and regulations
- allowable defences for apparent compliance breaches
- organisational policies and procedures
- organisational policy and procedures concerning release of information to external bodies
- the limits imposed by organisation's negotiating parameters

Competence also includes the ability to isolate the causes of issues within the incident response system and to be able to distinguish between causes of issues indicated by:

- failed compliance measures
- inability to locate relevant legislation
- failure to comply with timeframes dictated by legislation or regulation

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	1	2	2	2

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Unit title

PMASUP410A Develop plant documentation

Unit descriptor

This unit of competency covers the development, establishment and evaluation of plant documentation in response to identified information requirements including the development of workplace documents for the introduction of new systems, processes, equipment and record keeping requirements. The competency unit applies to a wide range of plant documentation.

This unit does NOT apply to the participation in reviewing workplace documentation, which is covered by PMASUP210A.

Typically, the employee would:

- investigate the need for new plant documentation
- determine operating principles and best practice in consultation with others
- draft plant documentation
- validate and modify plant documentation in response to feedback
- communicate changes and amendments.

Prerequisites

This unit **has** the prerequisites of:

- PMASUP210A Process and record information.

Element	Performance criteria
1. Identify information need/deficiency.	1.1 Identify the need for documentation in accordance with company requirements 1.2 Evaluate current documentation where existent 1.3 Define information need/deficiency 1.4 Discuss information requirements with appropriate personnel.
2. Develop plant documentation.	2.1 Specify information need and set/prioritise objectives 2.2 Analyse existing documentation/records in accordance with specified requirements 2.3 Determine operating principles and best practice where required 2.4 Develop/amend documentation as a draft in accordance with specifications to standard format 2.5 Issue documentation to appropriate personnel for review 2.6 Edit documentation and amend in accordance with review requirements 2.7 Complete documentation to satisfy the initial identified need/deficiency.

3. Communicate changes to plant documentation.	3.1 Explain and communicate documentation to all relevant personnel 3.2 Distribute documentation to all appropriate personnel 3.3 Evaluate implementation of documentation 3.4 Amend documents if required.

Range of variables

Context

This competency is typically performed by experienced operators, team leaders or supervisors who may be working individually or in a team environment.

This competency includes the following indicative plant documentation :

- operating procedures
- work instructions
- incident procedures
- operating manuals
- quality manuals and 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.

Sources of information may include:

- manufacturing specifications
- product specifications
- company policies and procedures
- customer requirements
- industry/work place codes of practice
- State/industry OHS legislation and regulations
- ISO and other industry standards and regulations
- industry associations, networks and professional bodies.

This competency includes items of equipment such as:

- computer equipment.

All operations are performed in accordance with standard operating procedures.

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.

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Evidence guide

Assessment context and methods

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

Assessment will typically use a plant documentation development project.

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

Critical aspects

Evidence of satisfactory performance in this unit can be obtained by observation of performance and questioning to indicate understanding and knowledge of the elements of the competency and performance criteria.

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

- effective maintenance and evaluation of workplace documentation is carried out
- effective research and consultation is undertaken to ensure the development of best practice documentation
- feedback is provided on how to improve workplace documentation
- completed documentation is user friendly, accurate and in accordance with the intended use/requirements
- adequate documentation is produced including documentation for the introduction of new systems, policies, equipment or processes
- non routine problems in relation to plant documentation are recognised and appropriate solutions are presented
- changes to workplace documentation is communicated in the appropriate manner.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork units.

Essential knowledge

Competence, sufficient to be able to develop and amend work place documentation, to include the ability to apply and explain:

- enterprise's information systems and work place documentation
- enterprise quality and safety procedures
- principles of policy and procedure development
- principles of information/data management
- importance of effective consultation in developing documentation
- relevant equipment and operational processes.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	1

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Unit title

PMASUP420A Minimise environmental impact of process

Unit descriptor

This competency covers minimising waste and environmental threats from a plant and/or a process. It covers all resources used and products made by the plant, and is performed by more experienced operators who might be expected to develop and implement improvements to processes within the plant. This unit may be performed individually or as part of a team.

This competency also applies to capital projects, as well as improvements brought about by changes in work practices and procedures. In this competency, an operator would develop practices or procedures for:

- conserving resources
- minimising pollution
- minimising waste.

This requires the operator to have a good understanding of the resources used by the plant, the nature and source of pollutants and the waste materials produced by the plant. It also requires the operator to understand the impact of using resources, and the effect pollutants and waste can have on the local environment.

When developing a process or practice, the operator would identify which resource, pollutant or waste product that if reduced would give the most benefit. After developing procedures to conserve resources or minimise pollution/waste produced by the plant, the operator would then document the procedures to implement the changes.

Prerequisites

This unit **has** the prerequisites of:

- PMASUP120A Follow environmental work practices.

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.

Element	Performance criteria
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 greater benefit from their reduction 2.5 Develop methods to reduce the production of this pollutant 2.6 Complete required documentation to implement change.
3. Develop waste minimisation practices and/or procedures.	3.1 Identify the nature of wastes produced by the plant/process 3.2 Determine the source(s) of these wastes within the plant/process 3.3 Describe the impact of these wastes on the environment and society 3.4 Determine which waste(s) will yield a greater benefit from their reduction 3.5 Develop methods to reduce the production of this waste 3.6 Complete required documentation to implement change.

Range of variables

Context

This competency is performed by more experienced operators and may be performed individually or as part of a team. It includes the following indicative functions:

- examining plant records
- examining operating procedures and practices
- liaising with a range of internal people
- modifying/updating standard operating procedures to ‘lock in’ any changes.

Typical objectives will include:

- minimisation of waste
- maximisation of product yield from raw materials
- reduction in volume of pollutants made
- reduction in concentration/intensity of pollutants made
- reduction in emissions.

All operations are performed in accordance with standard procedures and policies.

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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.

Evidence guide

Assessment context and methods

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

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

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 implement changes
- the greatest yield is achieved by appropriate selection of type of resource usage, type of pollutant or waste product.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- Competency units relevant to the type of process equipment.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS100A Follow OHS procedures.

Essential knowledge

Competence to include the ability to 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.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	1	1	3	2

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Unit title

PMASUP432A Coordinate pipeline projects

Unit descriptor

In a typical scenario, the person is involved in the efficient coordination of projects on pipeline systems and facilities. Typical projects may include:

- installation of new plant piping and equipment
- pipeline repairs and modifications
- upgrades of existing plant, piping and equipment
- commissioning of pipelines and facilities
- construction and upgrade of pipeline easements.

The person would:

- prepare scoping documents, specifications and/or tenders
- manage the project through the construction and commissioning phases
- liaise with other staff, contractors, and authorities as required
- ensure that the project conforms with all of the necessary safety requirements.

Generally the person would be part of a team during the whole project and would perform all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does NOT require the operation of a central control panel.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Prepare project specification documents.	1.1 Analyse the proposed project to establish contract specifications 1.2 Conduct a documented hazard and risk assessment on the proposed project, identifying all potential hazards and risks 1.3 Draft specification documents stating the required work activity and health, safety and environmental requirements 1.4 Seek tenders for the specified works, review as per the relevant company procedure and appoint a winning tenderer.

Element	Performance criteria
2. Prepare project schedule and documentation.	2.1 Draft a project schedule to establish project timeframe, work activities and procurement of materials 2.2 Apply the job safety analysis process to specific project activities reflecting any health, safety and environmental issues identified in the project risk and hazard assessment 2.3 Write procedures and work instructions for project work activities from the outcome of the job safety analysis process.
3. Conduct induction training for project.	3.1 Discuss company/site specific procedures and health, safety and environmental requirements with contractors/employees carrying out the specified works 3.2 Assess all persons who are inducted to ensure they understand the company/site procedures and health, safety and environmental requirements 3.3 Inspect all equipment and machinery utilised to carry out the works to ensure these comply with company/site requirements.
4. Monitor progress of project.	4.1 Purchase materials required for fabrication and installation on the project and inspect to ensure all items meet project specifications 4.2 Monitor project works to ensure activities are carried out to project specification and minimal impact occurs on existing operations and environment 4.3 Issue permits to work where project activities impact on existing pipeline operations 4.4 Amend and/or modify original specifications and communicate to all parties involved as per the relevant company procedure 4.5 Produce project reports updating project schedule progress, activities and health, safety and environmental issues, and discuss with all parties involved 4.6 Draft operations manuals and compile vendor data manuals to assist in the operation of the equipment/facility after project completion.
5. Complete and commission project.	5.1 Commission the project to ensure all work carried out meets project specifications and operational requirements 5.2 Restore the project site to meet environmental and operational requirements 5.3 Cancel permits to work and sign off at completion of works 5.4 Check all documentation, records and drawings pertaining to the project, verify for accuracy and hand over to the relevant operational department.

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Range of variables

Context

This competency includes all of the interactions necessary to plan, implement and complete a pipeline project, including the following aspects:

Provision of legislative requirements and information:

- OHS laws and codes of practice
- guidelines for preparation and submission of safety cases
- pipeline licenses
- environmental statutes and standards.

Authorities may include:

- Environmental Protection Authority (EPA)
- Department of Primary Industry and Energy (DOPIE)
- departments of minerals and energy — State and Territory
- Worksafe.

Inspection and testing techniques may include:

- hydrostatic testing
- magnetic particle inspection
- radiography
- ultrasonic inspection
- dye penetrant inspection.

Repair/modification techniques may include:

- hot tap and stoppling operations
- welding and cutting operations.

Reports may include:

- budget updates
- hazard and incident reports
- safety statistics report
- project schedule progress report
- materials and spares listings.

Applicable Australian standards may include:

- AS 2885
- AS 4041
- AS 3000.

The use and operation of personal computers, other hardware mediums and associated software is required.

Plans and drawings may include:

- pipeline alignment drawings
- process and instrument drawings
- workshop fabrication drawings.

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.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be using a pipeline project. Where it is not appropriate to use an actual pipeline project, then a simulated project may be used. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation.

Simulation may be required to allow for timely assessment of parts of this unit of competency (eg, elements 4 and 5). Simulation should be based on an actual project and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through 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

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- early warning signs of items needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure a timely return to plan.

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

Resource implications

Assessment will require access to a project over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

- PMASUP242A Monitor pipeline civil works

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- PMAOHS300A Implement and monitor OHS policies and procedures for a workgroup
- PMASUP241A Maintain pipeline easements.

Essential knowledge

A demonstrated working knowledge and application of the company's specific work organisations and workflow would be highly regarded.

A demonstrated knowledge of process and pipeline equipment is essential in underpinning a person's competency in this unit including:

- architecture of pipeline systems and facilities
- pipeline operations knowledge
- pipeline system operating parameters
- quality assurance systems and plans
- emergency response plans and procedures.

The ability to coordinate project activities and report on project status would be considered as a critical component of this unit.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	2	3	2

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Unit title

PMASUP440A Commission/recommission plant

Unit descriptor

In a typical scenario, a new plant/pipeline or a major plant/pipeline upgrade is to be commissioned/recommissioned with a leading plant technician taking a significant role. This unit does not cover startup of a plant/pipeline after a shutdown, unless there have been major changes to the plant during the shutdown. For a normal startup use *PMAOPS411A Manage plant shutdown and restart*.

The technician is involved in the design of the plant/plant modifications and the planning of the startup. This does not preclude the inclusion of 'turnkey' type projects, provided the technician has had a role in the plant design — eg, checking operability, suitability for local conditions.

This competency includes all equipment associated with the new/modified plant. The technician would not normally have a 'hands on' operating role for all items of equipment, but may have a 'hands on' role for major items of equipment. More importantly, the technician will have an overall role and would be expected to have an understanding of the function of all items of equipment in the plant so that detailed directions can be given plant operators who are performing the 'hands on' role during the commissioning/recommissioning.

This competency is typically performed by experienced technicians, likely to be the leaders of an operational team, usually working in conjunction with a design team, for the purpose of commissioning or recommissioning plant/pipelines. As commissioning is usually a team activity, the technician will take a lead technical role, rather than undertake all aspects on an individual basis.

Prerequisites

- This unit **has** the prerequisites of at least one relevant OPS300 unit.

Element	Performance criteria
1. Contribute to the design of plant/equipment.	1.1 Apply process understanding to the design process 1.2 Identify the role and purpose of the plant and equipment 1.3 Ensure design meets the identified need 1.4 Identify process conditions and apply to hazard and operability studies 1.5 Undertake investigations following hazard studies 1.6 Record and report findings.

2. Take part in commissioning planning.	2.1 Ensure the work is coordinated effectively with others involved on the work site 2.2 Obtain materials necessary to complete the work and check against job requirements 2.3 Obtain tools and equipment necessary to carry out the work and check for correct operation and safety 2.4 Prepare plans to ensure that procedures are performed in the correct sequence 2.5 Obtain approvals where necessary from appropriate authorities.
3. Participate in acceptance of plant/equipment.	3.1 Undertake precommissioning activities 3.2 Complete safety acceptance documentation 3.3 Identify, record and report problems or non-conformance 3.4 Conduct trials/test runs 3.5 Record and report performance data.
4. Commission system.	4.1 Bring the plant/plant systems/pipeline on line 4.2 Make and report adjustments 4.3 Prepare reports in accordance with legislative and company requirements to maintain the historical record.
5. Evaluate results and identify modifications.	5.1 Identify modifications and improvements required Check specifications, procedures and training material match the final system/procedures Complete documentation and report to appropriate personnel.

Range of variables

Context

Commissioning refers to the start-up of an new plant or plant unit and the associated equipment for the first time.

Recommissioning refers to the start-up of an existing plant following major modifications, rebuild or reconfiguration.

This competency unit includes the functions of :

- liaison with manufacturers, engineering personnel, designers, contractors and maintenance and other company personnel
- participation in hazard studies, which may include:
  - hazard and operability studies (HAZOP)
  - hazard analysis studies (HAZAN)

Precommissioning activities may include:

- checking plant is built to design
- ensuring plant is safe to operate
- ensuring plant area is clean and clear of debris
- ensuring the plant internals are clean and clear of debris
- functional checking of equipment and ancillaries.

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Commissioning/recommissioning activities may include:

- trial running of equipment
- use of trial materials in plant
- safe introduction of process materials to plant
- producing product within specification
- bringing plant to design rates
- solving operational problems
- disposal of waste generated in the start-up.

Tools, materials and equipment may include:

- hand tools, including power operated
- other power operated tools
- plant
- emergency equipment
- electrical and electronic test equipment
- gas detectors
- air compressor
- water pump.

Appropriate authorities may include:

- local councils
- road authority
- sewerage and stormwater authorities
- providers of services such as electricity, water and telephones.

Plant/pipeline systems may include:

- pipes
- valves
- operating units
- electrical and electronic components
- PLCs/DCS control (programmable logic controllers, distributed control systems) or other plant controls
- cathodic protection
- pressure/flow/temperature etc regulation and meters.

Documentation may include:

- operating procedures
- OHS and environmental legislative requirements
- manufacturers' specifications
- appropriate authority approvals
- quality assurance inspection and test reports.

All operations are performed in accordance with standard operating procedures.

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.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be on an operating plant. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency.

Simulation may be required to allow for timely assessment of this unit of competency. It is possible that a simulation will be required to ensure that the technician is competent before taking a significant role in a commissioning activity. Commissioning is an infrequent and often frenetic activity and so it may not be practical or equitable to wait for an actual commissioning to occur to use this as the basis for assessment. Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/ scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken to ensure commissioning stays on schedule
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Consider co-assessment with:

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- PMACOM300A Develop plant documentation.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures
- PMAOHS300 Implement and monitor OHS policies and procedures for a work group
- PMAOHS401 Assess risk.

Essential knowledge

Competence to include the ability to apply and explain

- HAZOP study process and the interpretation of findings
- results and impact of a HAZAN study
- the process of hazard identification, risk assessment and control
- hierarchy of control
- sources of hazard information (such as Material Safety Data Sheets)
- principles of operation of equipment
- interpretation of design drawings, schematics and manuals
- principles of operation of instrumentation
- principles of basic control systems
- distinguish between the following problem sources, and their avoidance:
  - chemical
  - instrument
  - equipment (electrical/mechanical)
  - maintenance.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	2	3	3

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Unit title

PMASUP441B Decommission plant

Unit descriptor

In a typical scenario, an existing plant/pipeline or major plant area, and its associated equipment, are to be decommissioned. Decommissioning refers to the removal from service of plant/pipeline and equipment and its storage/'mothballing' or disposal. This unit does not cover the shutdown of a plant/pipeline - use *PMAOPS411A Manage plant shutdown and restart*.

This competency is typically performed by experienced technicians, likely to be the leaders of an operational team, usually working in conjunction with a decommissioning team, for the purpose of decommissioning plant/pipelines. As decommissioning is usually a team activity, the technician will take a lead technical role, rather than undertake all aspects on an individual basis.

Much of the activity of successful decommissioning is in planning the activity and then supervising the work to ensure it is done safely and efficiently with no environmental damage. The technician may have no 'hands on' role at all

Prerequisites

This unit **has** the prerequisites of at least one relevant OPS300 unit.

Element	Performance criteria
1. Contribute to decommissioning planning.	1.1 Apply process understanding to the planning process 1.2 Identify the role and purpose of the plant and equipment 1.3 Ensure the work is coordinated effectively with others involved on the work site 1.4 Identify process conditions and apply to hazard studies 1.5 Undertake investigations following on from hazard studies 1.6 Obtain materials necessary to complete the work and check against job requirements 1.7 Obtain tools and equipment necessary to carry out the work and check for correct operation and safety 1.8 Prepare plans to ensure that procedures are performed in the correct sequence 1.9 Obtain approvals where necessary from appropriate authorities to ensure decommissioning process proceeds in accordance with the plan. 1.10 Complete all appropriate documentation.

Element	Performance criteria
2. Isolate and decontaminate equipment/unit.	2.1 Interpret and apply decommissioning plan 2.2 Identify and use appropriate safety equipment and materials 2.3 Isolate and decontaminate equipment components as required 2.4 Dispose of contaminated materials or components as required 2.5 Complete required documentation.
3. Inspect, test and notify completion of work.	3.1 Select tools and equipment appropriate to the testing/ inspection requirements and utilise in accordance with manufacturer's specifications, and legislative requirements 3.2 Test/inspect in accordance with requirements 3.3 Ensure compliance with OHS legislative requirements for risk assessment prior to disposal 3.4 Ensure any required additional work is undertaken/initiated 3.5 Notify work completion.

Range of variables

Context

This competency unit includes the functions of :

- liaison with manufacturers, engineering personnel, designers, maintenance personnel
- participation in hazard and operability studies (HAZOP) and hazard analysis studies (HAZAN)
- removal of plant and equipment from service, which may include:
  - 'mothballing'
  - storage
  - disassembly
  - demolition
- decontamination of equipment
- disposal of equipment and waste.

This competency unit includes the understanding and application of:

- OHS regulations especially those related to plant
- codes of practice
- disposal procedures and regulations.

All operations are performed in accordance with standard operating procedures

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.

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Evidence guide

Assessment context and methods

Assessment for this unit of competency will be related to a plant/pipeline. The unit 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 timely assessment of this unit of competency. It is possible that a simulation will be required to ensure that the technician is competent before taking a significant role in a decommissioning activity. Decommissioning is an infrequent activity and so it may not be practical or equitable to wait for an actual decommissioning to occur to use this as the basis for assessment.

Simulation should be based on the actual plant and will include walk throughs of the relevant competency components. Simulations may also include the use of case studies/ scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

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

- potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate, timely action is taken
- obvious problems in related plant areas are recognised and an 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.

Resource implications

Assessment will require access to a plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS200 Participate in workplace safety procedures
- PMAOHS300 Implement and monitor OHS policies and procedures for a work group
- PMAOHS401 Assess risk.

Essential knowledge

Competence to include the ability to apply and explain

- chemistry of materials involved
- principles of operation of the process
- principles of operation of the equipment involved
- HAZOP study process and the interpretation of findings
- results and impact of a HAZAN study
- hazardous substances legislation
- the process of hazard identification, risk assessment and control
- sources of hazard information (such as Material Safety Data Sheets)
- safe disposal methods of materials and equipment
- decontamination processes.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	2	3	3

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Unit title

PMLSAMP400A Obtain representative samples in accordance with a sampling plan

Unit descriptor

This unit of competency covers the ability to obtain a range of samples that are representative of the source material in a state suitable for further processing and testing.

Careful and responsible sampling is essential to any testing process. If sampling is not performed correctly, high quality materials could be mistaken for poor quality materials leading to rejection and perhaps rework. On the other hand, if poor quality materials are approved for production, finished products will be faulty.

For example, representative samples must be taken from starting materials before they can be approved for manufacture. When 50 drums of a batch of starting material arrive, the drums are inspected for any visible damage, then labelled and numbered according to enterprise procedures. The sampler follows a sampling plan which indicates how many drums are to be sampled. If 10 drums are to be sampled, a random number generator may be used to pick which 10 of the 50 will be sampled. The surface of the drums is cleaned to prevent surface dust and particulate matter falling into the drum during sampling and a sample is taken from each drum. The sampling plan will tell the sampler if these 10 samples are to be placed in individual bottles or composited, depending on the types of testing required and the quality profile of the supplier.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Prepare for sampling.	1.1 Receive and confirm instructions from appropriate sampling plan, safety procedures and reporting procedures 1.2 Select sampling equipment and conditions to preserve sample integrity during collection, storage and transit 1.3 Ensure equipment is in working order 1.4 Confirm the procedure and frequency of sampling in accordance with enterprise requirements and/or relevant standards.

Element	Performance criteria
2. Obtain the samples.	2.1 Inspect materials to ensure materials are fit for sampling 2.2 Recognise and report atypical observations made during sampling 2.3 Collect samples ensuring that sample types, sampling locations and sampling times are in accordance with sampling plan 2.4 Record all information in accordance with chain of custody requirements 2.5 Maintain the integrity of the samples and source during sampling.
3. Prepare sample for testing.	3.1 Prepare subsample(s) to ensure that they are representative 3.2 Follow approved safety procedures to limit hazard or contamination to self, work area and environment 3.3 Prepare sample for transport in accordance with hazardous goods legislation.
4. Store backup samples.	4.1 Prepare subsample as a backup 4.2 Label backup sample(s) and record information to maintain chain of custody.
5. Dispose of waste and spent samples.	5.1 Dispose of waste and surplus/spent samples in accordance with enterprise procedures 5.2 Clean equipment, containers and work area in accordance with enterprise procedures.

Range of variables

Context

The following variables may apply to all industry sectors covered by this Training Package.

A *representative* sample is a sample obtained using a suitable sampling technique, which may include subsampling, to provide an accurate representative of the original source or population.

This unit of competency may cover laboratories or processing sites which may involve:

- a range of sampling plans, tests and procedure, which apply to the enterprise site, plant laboratory or field sites
- different products/materials
- a range of sampling points
- test methods and enterprise procedures, which may be written to meet enterprise and/or regulatory/certifying body requirements.

Samplers usually have access to information such as:

- enterprise procedures
- materials safety data sheets (MSDSs)
- Australian Standards
- enterprise sampling schemes and sampling plans

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- enterprise recording and reporting procedures.

Sampling tools and equipment may include but are not limited to:

- shovels
- sampling frames
- sampling tubes
- front-end loader
- weighted sample bottles
- dip tubes
- spears
- flexible bladders
- syringes
- access valves
- sample thief
- bottles, plastic containers and disposable buckets
- scalpel or surgical knife
- traps and cages
- sterile containers, pipettes, inoculating loops, disposable spoons.

Maintenance of integrity of samples could include:

- appropriate container:
  - glass
  - plastic
  - amber
  - opaque
- sampling tools
- preservatives (such as sodium azide, toluene or antibiotics)
- wrapping container in foil
- temperature control, which may involve insulation of sample without direct contact with coolant
- transfer of sterile sample into sterile container
- monitoring of storage conditions.

Updating information

Changes in codes of practice and applicable standards should be noted.

Evidence guide

Assessment context and methods

This unit of competency is to be assessed in the workplace or simulated workplace environment.

Critical aspects

The following aspects of competency apply to all industry sectors covered by this Training Package.

Competency must be demonstrated in the ability to follow a sampling plan to collect a sufficient representative sample that has been properly labelled and has the intact properties of the original sample source.

In particular, the assessor should look to see that the candidate is able to:

- take the specified quantity of sample to enable all processing and testing to occur and backup samples to be stored
- obtain a sample that is representative to the rest of the material not sampled
- preserve or protect the sample to minimise change by closely adhering to procedures
- supply enough information on the label to link the sample to its origins in the bulk material
- identify atypical materials and samples and take appropriate action
- maintain sampling equipment in appropriate condition
- complete sampling records
- follow safety regulations
- follow relevant legislative requirements for the disposal of waste and the preservation of the environment.

Assessment methods and resources

The following assessment methods are suggested:

- observation of the candidate taking a range of samples
- feedback from peers, customers and supervisors that sampling plans were followed
- examples of workplace documentation completed by the candidate
- questioning to assess underpinning knowledge.

Resources may include:

- variety of sample types
- sampling plans
- a selection of sampling containers and sampling equipment.

Essential knowledge

The following knowledge requirements apply to all industry sectors covered by this Training Package.

Competency includes the ability to apply and explain:

- the links between correct OHS procedures and personal and environmental safety particularly at high risk sites
- the basic principles of sampling including:
  - representative samples
  - preservation of integrity of samples
  - maintaining identification of samples relative to their source
  - cost effectiveness of sampling
  - consistency of sampling procedures
- characteristics of product/material to be sampled and likely contaminants
- links between quality control, quality assurance and quality management systems and sampling procedures
- workplace procedures dealing with legislative requirements for the handling, labelling and transport of hazardous goods.

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Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	1	2	1	2	1	1

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9597 version 3 Undertake corrosion inspection in a petrochemical environment

level: **4**

credit: **10**

final date for comment: January 2006

expiry date: December 2007

sub-field: Petrochemical industry

purpose: People credited with this unit standard are, in a petrochemical environment, able to: identify corrosion inspection equipment; use corrosion inspection equipment; and use documentation and reporting procedures.

entry information: Open

accreditation option: Evaluation of documentation and visit by NZQA and industry

moderation option: A centrally established and directed external moderation system has been set up by the Gas and Petrochemical Industry Training Organisation.

special notes:

1 This unit standard is intended for, but not limited to, workbased assessment. While all performance criteria must be met it is noted that some range statements within this unit standard are indicative and dependent on enterprise and site specific equipment, procedures and practices. Any queries can be directed to the National Moderator, Gas and Petrochemical Industry Training Organisation.

2 Performance in relation to the elements must comply with regulations and codes pertaining to the petrochemical industry. A full list of current regulations and applicable codes is available from the Gas and Petrochemical Industry Training Organisation.

3 For individual worksites, references to *in accordance with site application, site specific requirements, site laboratory procedures* mean that site procedures must comply with the above legislation, regulations and industry codes and/or practices.

4 All work practices must meet recognised codes of practice and documented company health and safety procedures. Where these exceed code of practice for personal, product and company health and safety, they must meet the obligations required under current

legislation, including the Health and Safety in Employment Act 1992.

5 All work practices must meet recognised codes of practice and documented company environmental procedures. Where these exceed code for personal, product, and company environmental matters, they must meet the obligations required under current legislation including the Resource Management Act 1991.

6 Work practices must meet documented company quality management requirements. This includes documentation of activities, events and decisions.

Elements and Performance Criteria

Element 1

Identify corrosion inspection equipment in a petrochemical environment.

Performance criteria

1.1 Corrosion inspection equipment is described that meets site specific requirements.

Range: fixed, laboratory, portable.

1.2 Corrosion inspection equipment is located and its use explained according to site specific applications.

1.3 Functions of site corrosion inspection equipment are explained in relation to the type of information relayed.

Range: wall thicknesses, cracks, fractures, pit depth, general corrosion.

Element 2

Use corrosion inspection equipment.

Performance criteria

2.1 Conditions are assessed to determine the need to use corrosion inspection equipment.

2.2 Corrosion inspection equipment related to the site specific conditions is selected in accordance with site requirements.

2.3 Corrosion inspection equipment is operated in accordance with plant procedures and manufacturer's instructions.

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2.4 Safety procedures relating to corrosion inspection techniques are identified according to site requirements.

2.5 Potential hazards of incorrect application and operation are explained according to site requirements and procedures.

Element 3

Use documentation and reporting procedures.

Performance criteria

3.1 Documentation and standards for corrosion inspection equipment are used according to regulatory and site requirements.

Range: test certificates, certification, standards for safety, standards for in service safety inspection and testing of equipment, identification tags, labels.

3.2 General equipment documentation and relevant information are used relevant to site specific requirements.

Range: manufacturer's information, equipment operating manuals, safety procedures, operating procedures, maintenance procedures.

3.3 Records and documents are completed according to site procedures.

Comments to:
Gas and Petrochemical Industry Training Organisation
Unit Standard Revision
PO Box 160
WELLINGTON

by January 2006.

Please Note: Providers must be accredited by the Qualifications Authority before they can offer programmes of education and training assessed against unit standards.
Accredited providers assessing against unit standards must engage with the moderation system that applies to those unit standards. [Please refer to relevant Plan ref: 0124]

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9630 version 3 Demonstrate knowledge of HAZOP study and QRA in a petrochemical environment

level: **4**

credit: **4**

final date for comment: January 2006

expiry date: December 2007

sub-field: Petrochemical industry

purpose: People credited with this unit standard are, in a petrochemical environment, able to: explain the principles of Hazard Operability study (HAZOP) and Quantitative Risk Assessment (QRA); describe how HAZOP studies are applied in a workplace environment; and describe own participation in a HAZOP study.

entry information: Open

accreditation option: Evaluation of documentation and visit by NZQA and industry

moderation option: A centrally established and directed external moderation system has been set up by the Gas and Petrochemical Industry Training Organisation.

special notes:

1 This unit standard is intended for, but not limited to workbased assessment. While all performance criteria must be met it is noted that some range statements within this unit standard are indicative and dependent on enterprise and site specific equipment, procedures and practices. Any queries can be directed to the National Moderator, Gas and Petrochemical Industry Training Organisation.

2 Performance in relation to the elements must comply with regulations and codes pertaining to the petrochemical industry. A full list of current regulations and applicable codes is available from the Gas and Petrochemical Industry Training Organisation.

3 For individual worksites, references to *in accordance with site application, site specific requirements, site laboratory procedures* mean that site procedures must comply with the above legislation, regulations, and industry codes and/or practices.

4 All work practices must meet recognised codes of practice and documented company health and safety procedures. Where these exceed code of practice for personal, product and company health and safety, they must meet the

obligations required under current legislation, including the Health and Safety in Employment Act 1992 and Health and Safety in Employment Regulations 1995

5 All work practices must meet recognised codes of practice and documented company environmental procedures. Where these exceed code for personal, product, and company environmental matters, they must meet the obligations required under current legislation including the Resource Management Act 1991.

6 Work practices must meet documented company quality management requirements. This includes documentation of activities, events and decisions.

Elements and Performance Criteria

Element 1

Explain the principles of a HAZOP study and a QRA in a petrochemical environment.

Performance criteria

1.1 The purpose of a HAZOP study is explained in terms of site requirements.

1.2 The purpose of a QRA is explained in terms of site requirements.

1.3 A HAZOP study is described to identify key steps.

Range: guide tools, HAZOP process, deviations, consequences, record sheets, actions, team formation and facilitation.

1.4 QRA processes are described to identify key steps.

Range: estimate frequency, estimate consequences to employees, public, plant and profits, estimate impact of consequences, compare with a target or specification figure.

1.5 Tools used in HAZOP study procedures are explained according to site requirements.

Range: HAZOP study meetings, logic trees, logic gates, keywords.

Element 2

Describe how HAZOP studies are applied in a workplace environment.

Performance criteria

2.1 The roles and number of persons in a HAZOP study team are described.

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Range: leader, scribe, design engineer, operational and maintenance representatives, other specialists.

2.2 The steps in a HAZOP study are described in terms of site requirements.

Range: cause, consequence, mitigation, action, overview, boundaries, line selection, guide-words.

2.3 The responsibilities of each team member in a HAZOP study are described in terms of site requirements.

Range: preparation, application of experience, focus on system failure, active participation, record verification.

Element 3

Describe own participation in a HAZOP study.

Performance criteria

3.1 The description includes the objectives of a HAZOP study.

3.2 The description includes and explains own role and responsibilities in a HAZOP study.

Range: examples are follow up actions, reporting, feedback, modifications.

Comments to:
Gas and Petrochemical Industry Training Organisation
Unit Standard Revision
PO Box 160
WELLINGTON

by January 2006.

Please Note: Providers must be accredited by the Qualifications Authority before they can offer programmes of education and training assessed against unit standards.
Accredited providers assessing against unit standards must engage with the moderation system that applies to those unit standards. [Please refer to relevant Plan ref: 0124]

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Unit title

BSBCMN402A Develop work priorities

Unit descriptor

This unit covers the skills and knowledge required to plan own work schedules, monitor and obtain feedback on work performance and development.

Prerequisites

This unit **has no** prerequisites

Element	Performance criteria
1. Plan own complete work schedule	1.1 Work group plans are prepared to reflect consideration of resources, client needs and work group targets 1.2 Work objectives and priorities are analysed and incorporated into personal schedules and responsibilities 1.3 Factors affecting the achievement of work objectives are identified and contingencies established and incorporated into work plans 1.10 Business technology is used efficiently and effectively to manage and monitor planning completion and scheduling of tasks.
2. Monitor own work performance.	2.1 Personal performance standards are identified and analysed through self assessment and feedback from others on the achievement of work objectives 2.2 Feedback on performance is actively sought from colleagues and clients and evaluated in context of individual and group requirements 2.3 Variations in the quality of service and products are routinely identified and reported in accordance with organisational requirements.
3. Coordinate professional development.	3.1 Personal knowledge and skills are assessed against competency standards performance descriptions to determine development needs and priorities 3.2 Opportunities for improvement and sources of learning are researched and planned in liaison with colleagues 3.3 Feedback is used to identify and develop ways to improve competence within available opportunities 3.4 New skills are identified and professional development activities are accessed and completed to facilitate continuous learning and career development 3.5 Records and documents relating to achievements and assessments are stored and maintained in accordance with organisational requirements.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

They may use legislation, codes and national standards relevant to the workplace including:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

Workgroup plans may include:

- sales plans
- reporting plans
- production plans
- budgetary plans
- team participation
- work schedules
- team and individual learning goals.

Work objectives may include:

- sales targets
- reporting deadlines
- production targets
- budgetary targets
- team participation
- team and individual learning goals.

Factors affecting the achievement of work objectives may include:

- competing work demands
- technology/equipment breakdowns
- unforeseen incidents
- personnel
- environmental factors such as time, weather, etc
- resource and materials availability
- budget constraints.

Business technology may include:

- computers
- computer applications
- personal schedules
- modems
- scanners
- e-mail and internet/intranet/extranet
- photocopiers

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- facsimile machines
- printers.

Feedback on performance may include:
- formal/informal performance appraisals
- obtaining comments from supervisors and colleagues
- obtaining comments from clients
- personal, reflective behaviour strategies
- routine organisational methods for monitoring service delivery.

Organisational requirements may be included in:
- quality assurances and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- business and performance plans
- access and equity principles and practice
- ethical standards
- occupational health and safety policies, procedures and programs
- quality and continuous improvement processes and standards
- defined resource parameters.

Competency standards are standards which measure:
- all those personal and technical knowledge, skills and attitudinal aspects (competencies) required to effectively and efficiently undertake the day to day tasks and duties of the practitioner's work function.

Professional development activities may include:
- coaching, mentoring and/or supervision
- formal/informal learning programs
- internal/external training provision
- work experience/exchange/opportunities
- personal study
- career planning/development
- performance appraisals
- workplace skills assessment
- recognition of prior learning.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects
- preparing and communicating work plans
- scheduling work objectives and tasks to support the achievement of goals
- seeking and acting on feedback from clients and colleagues
- reviewing own work performance against achievements through self assessment
- accessing learning opportunities to extend own personal work competencies
- using business technology to monitor self development.

Underpinning knowledge

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts:

- the relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination.
- understanding the organisation's policies, plans and procedures
- understanding of methods to elicit, analyse and interpret feedback
- knowledge of techniques to prepare personal plans and establish priorities
- knowledge of quality standards for products and services
- knowledge of relevant business technology applications
- understanding of methods to evaluate own performance
- processes to interpret competency standards and apply them to self
- methods to identify and prioritise personal learning needs
- understanding range of professional development activities and criteria to apply in choosing between them.

Underpinning skills

- literacy skills to understand the organisation's policies and procedures; interpret competency standards; use a variety of strategies for planning and reviewing own work
- problem solving skills to develop contingency plans
- evaluation skills for assessing outcomes
- communication skills including giving and receiving constructive feedback on development needs
- technology skills including the ability to select and use technology appropriate to a task
- time management skills to complete tasks within agreed timeframes
- observation skills for identifying opportunities for learning and development
- participation skills for integrating as a member of a work team
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.

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- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to measure self-performance
- communicating ideas and information (level 2) with members of the work team
- planning and organising activities (level 2) for self
- working with teams and others (level 2) in completing scheduled tasks
- using mathematical ideas and techniques (level 1) as an aid to measure and schedule tasks
- solving problems (level 2) as an aid to self-development
- using technology (level 2) to manage scheduling and completion of tasks.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	2

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Unit title

BSBCMN404A Develop teams and individuals

Unit descriptor

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

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Determine development needs.	1.1 Learning and development needs are systematically identified and implemented in line with organisational requirements 1.2 A learning plan to meet individual and group training and development needs is collaboratively developed, agreed to and implemented 1.3 Individuals are encouraged to self evaluate performance and identify areas for improvement 1.4 Feedback on performance of team members is collected from relevant sources and compared with established team learning needs.
2. Develop individuals and teams.	2.1 Learning and development program goals and objectives are identified to match specific knowledge and skill requirements of competency standards 2.2 Learning delivery methods are appropriate to the learning goals, the learning style of participants, and availability of equipment and resources 2.3 Workplace learning opportunities and coaching and mentoring assistance are provided to facilitate individual and team achievement of competencies 2.4 Development opportunities incorporate a range of activities and support materials appropriate to the achievement of identified competencies 2.5 Resources and timelines required for learning activities are identified and approved in accordance with organisational requirements.
3. Monitor and evaluate workplace learning.	3.1 Feedback from individuals or teams is used to identify and implement improvements in future learning arrangements 3.2 Outcomes and performance of individuals/teams are assessed and recorded to determine the effectiveness of development programs and the extent of additional development support 3.3 Modifications to learning plans are negotiated to improve the efficiency and effectiveness of learning 3.4 Records and reports of competency are documented and maintained within organisational requirements.

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Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

They may use legislation, codes and national standards relevant to the workplace including:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

Learning and development needs may include:

- coaching, mentoring and/or supervision
- formal/informal learning programs
- internal/external training provision
- work experience/exchange/opportunities
- personal study
- career planning/development
- performance appraisals
- workplace skills assessment
- recognition of prior learning.

Organisational requirements may be included in:

- quality assurances and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- occupational health and safety 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
- defined resource parameters.

Feedback on performance may include:

- formal/informal performance appraisals
- obtaining comments from supervisors and colleagues
- obtaining comments from clients
- personal, reflective behaviour strategies
- routine organisational methods for monitoring service delivery.

Competency standards are standards which measure:

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- all those personal and technical knowledge, skills and attitudinal aspects (competencies) required to effectively and efficiently undertake the day to day tasks and duties of the practitioner's work function.

Learning delivery methods may include:

- on-the-job coaching or mentoring
- problem solving
- presentations/demonstrations
- formal course participation
- work experience
- involvement in professional networks
- conference and seminar attendance
- induction.

Equipment and resources may include:

- funding
- facilities
- guest speakers
- training equipment such as whiteboards and audio-visual equipment
- technological tools and equipment
- time.

Coaching and mentoring assistance may include:

- providing feedback to another team member
- fair and ethical practice
- non-discriminatory processes and activities
- respecting the contribution of all participants and giving credit for achievements
- presenting and promoting a positive image of the collective group
- problem solving
- providing encouragement.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- identifying and implementing learning opportunities for others
- giving and receiving feedback constructively
- facilitating participation of individuals in the work of the team
- negotiating learning plans to improve the effectiveness of learning
- preparing learning plans to match skill needs
- accessing and designing learning opportunities.

Underpinning knowledge

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts:

- the relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- knowledge of the principles of coaching and mentoring for development of competence
- understanding how to work effectively with team members who have diverse work styles, aspirations, cultures and perspectives
- understanding how to facilitate team development and improvement
- knowledge of the organisation's policies, plans and procedures
- understanding methods and techniques for eliciting and interpreting feedback
- understanding methods for identifying and prioritising personal development opportunities and options
- knowledge of career paths and competency standards in the industry.

Underpinning skills

- literacy skills to read and understand a variety of texts; prepare general information and papers according to target audience; spell with accuracy; use grammar and punctuation effectively as an aid to understanding; maintain records of learning
- communication skills including receiving feedback and reporting, maintaining effective relationships and conflict management
- planning skills to organise required resources and equipment to meet learning needs
- coaching and mentoring skills to provide support to colleagues
- report writing skills to organise information; assess information for relevance and accuracy; identify and elaborate on learning outcomes
- facilitation skills to conduct small group training sessions
- time management skills for scheduling learning programs within work activities
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

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Key competencies

- collecting, analysing and organising information (Level 2) to measure self-performance
- communicating ideas and information (Level 2) with members of the work team
- planning and organising activities (Level 2) for self
- working with teams and others (Level 2) in completing scheduled tasks
- using mathematical ideas and techniques (Level 1) as an aid to measure and schedule tasks

- solving problems (Level 2) as an aid to self-development
- using technology (Level 2) to manage scheduling and completion of tasks.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	2

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Unit title

BSBCMN410A Coordinate implementation of customer service strategies

Unit descriptor

This unit covers the skills and knowledge required to advise on, and carry out customer service strategies, and evaluate customer strategies on the basis of feedback and design strategies for improvement.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Advise on customer service needs.	1.1 Customer service needs are clarified and accurately assessed using appropriate communication techniques 1.2 Problems matching service delivery to customers are diagnosed and options for improved service are developed within organisational requirements 1.3 Advice is relevant, constructive and promotes the improvement of customer service delivery 1.4 Business technology is used to structure and present information on customer service needs.
2. Support implementation of customer service strategies.	2.1 Customer service strategies and opportunities are promoted to designated individuals and groups 2.2 Available budget resources are identified and allocated to fulfil customer service objectives 2.3 Procedures to resolve customer difficulties and complaints are actioned promptly within organisational requirements 2.4 Coaching and mentoring assistance is provided to colleagues to overcome difficulties in meeting customer service standards 2.5 Decisions to implement strategies are taken in consultation with designated individuals and groups.
3. Evaluate and report on customer service.	3.1 Client satisfaction with service delivery is reviewed using verifiable data in accordance with organisational requirements 3.2 Changes necessary to maintain service standards are identified and reported to designated groups and individuals 3.3 Conclusions and recommendations are prepared from verifiable evidence and provide constructive advice on future directions of client service strategies 3.4 Systems, records and reporting procedures are maintained to compare changes in customer satisfaction.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

- Legislation, codes and national standards relevant to the workplace which may include:
- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

Customer needs may relate to:

- advice or general information
- specific information
- further information
- making an appointment
- complaints
- purchasing organisation's products and services
- returning organisation's products and services
- accuracy of information
- fairness/politeness
- prices/value.

Communication techniques may include:

- consultation methods, techniques and protocols
- analysing customer satisfaction surveys
- conducting interviews
- questioning
- summarising and paraphrasing
- seeking feedback to confirm understanding
- making recommendations
- obtaining management decisions
- analysing quality assurance data.

Customers can be:

- internal or external
- other agencies
- individual members of the organisation
- corporate customers
- individual members of the public.

Organisational requirements may include:

- quality assurances and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- occupational health and safety policies, procedures and programs

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- 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
- defined resource parameters
- who is responsible for products or services
- pricing and discount policies
- replacement and refund policies and procedures
- payment and delivery options.

Business technology may include:
- photocopier
- computer
- printer
- binder
- shredder
- answering machine
- fax machine
- telephone.

Designated individuals and groups may include:
- supervisor
- customers
- colleagues
- external organisation
- committee
- line management.

Procedures to resolve customer difficulties may include:
- using conflict management techniques
- refund of monies
- item replacement
- referrals to supervisor
- review of products or services
- external agencies (eg, Ombudsman).

Customer complaints may include:
- damaged goods or goods not delivered
- administrative errors such as incorrect invoices or prices
- warehouse or store room errors such as incorrect product delivered
- service errors
- delivery errors
- products not delivered on time
- customer satisfaction with service quality.

Coaching and mentoring assistance may include:
- providing feedback to another team member
- fair and ethical practice

- non-discriminatory processes and activities
- respecting the contribution of all participants and giving credit for achievements
- presenting and promoting a positive image of the collective group
- problem solving
- providing encouragement.

Customer service strategies may include:

- delivery times
- price offers
- product/service availability
- product/refund guarantees
- merchandise characteristics
- courtesy/politeness.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- identifying needs and priorities of the organisation in delivering services to customers
- distinguishing between different levels of customer satisfaction
- providing constructive advice on customer service practices
- responding to and reporting on customer feedback
- designing strategies to improve delivery of products and services.

Underpinning knowledge

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts:

- the relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- understanding the principles of customer services
- understanding the organisation's business structure, products and services
- understanding the organisation's policy and procedures for customer service including handling customer complaints
- knowledge of product and service standards and best practice models
- knowledge of common problems relating to customer service
- understanding consultation methods, techniques and protocols
- knowledge of techniques for dealing with customers with special needs.

Underpinning skills

- planning skills to develop implementation schedules
- evaluation skills to assess effectiveness of customer service strategies
- literacy skills to interpret a variety of texts; prepare information and papers; write formal and informal letters according to target audience
- interpersonal skills to relate effectively to people from a range of social, cultural and ethnic backgrounds

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- technology skills including the ability to select and use technology appropriate to a task
- problem solving skills to diagnose organisational problems relating to customer services
- report writing skills to provide recommendations for the enhancement of products or services
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to monitor and report on customer services
- communicating ideas and information (level 2) on products and services
- planning and organising activities (level 2) to enhance products and services
- working with teams and others (level 2) in completing scheduled tasks
- using mathematical ideas and techniques (level 2) to determine service or product costs
- solving problems (level 2) to respond to customer enquiries or complaints
- using technology (level 2) to complete allocated tasks.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	2	2	2

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Unit title

BSBCMN412A Promote innovation and change

Unit descriptor

This unit covers the skills and knowledge required to promote the use and implementation of innovative work practices to effect change.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Identify and develop opportunities for improved work practices.	1.1 Options for change incorporate identified improvements to work practices and procedures 1.2 Risk factors affecting change are analysed to identify potential constraints 1.3 Change is planned and resourced to promote the introduction and management of new processes 1.4 Benefits of change are clear and consistent with organisational requirements 1.11 Timelines and targets for implementation are realistic and support the achievement of change.
2. Lead team to foster innovative work practices.	2.1 Team members are selected to maximise innovative opportunities 2.2 Work assignments are organised to facilitate innovative work skills 2.3 Team members are provided with guidance and coaching on innovation in the workplace 2.4 Models of innovative work practices are provided and discussed.
3. Facilitate commitment to workplace change.	3.1 Opinions and suggestions on improving work practices are encouraged to facilitate participation in change processes 3.2 Goals and objectives of change are communicated clearly and promptly to individuals and teams 3.3 Business technology is used to manage and provide access to information on progress towards objectives of change 3.4 Mentoring and coaching is provided to support individuals and groups in introduction of change 3.5 Decisions to overcome problems in the implementation of change are made in consultation with designated individuals and groups 3.6 Effective relations and communications are maintained with clients and stakeholders during the process of change.

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Element	Performance criteria
4. Monitor and evaluate change.	4.1 Organisation's systems and technology are used to monitor progress towards objectives 4.2 Team members are actively encouraged to reflect on team activities and opportunities for improvement and innovation 4.3 Team activities are evaluated based on feedback from team members, management, clients and other interested people 4.4 Suggestions for work improvements made by team members are positively received and acted on where appropriate 4.5 Evidence and information on the impact of change is accurate, relevant and reported within organisational requirements 4.6 Recommendations for improving methods or techniques to manage change are negotiated with designated individuals and groups using appropriate negotiation skills 4.7 Systems, records and reporting procedures are maintained according to organisational requirements 4.8 Feedback on individual and group work practices is prompt and constructive.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

Change may include:

- implementation of new work practices and/or services
- organisational restructures
- introduction of new technology
- change in work location
- new client base
- staffing changes
- job role changes
- work priorities.

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Innovative work skills are:

- the skills required to come up with and develop new ideas or the new use of an old idea. They include:
  - interpretation
  - conceptualisation
  - representation
  - reflection
  - evaluation.

Organisational requirements may be included in:

- quality assurances and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- occupational health and safety policies, procedures and programs
- business and performance plans
- anti-discrimination and related policy
- access and equity principles and practice
- ethical standards
- quality and continuous improvement processes and standards
- defined resource parameters
- consultation and communication processes.

Risk factors may include:

- disturbances to workflow
- confusion/loss of confidence
- cost blow out
- supplier problems
- product/service delivery problems
- time delays.

Business technology may include:

- computer
- internet/extranet/intranet
- email
- software
- answering machine
- fax machine
- telephone.

Mentoring and coaching may include:

- providing feedback to another team member
- fair and ethical practice
- non-discriminatory processes and activities
- respecting the contribution of all participants and giving credit for achievements
- presenting and promoting a positive image of the collective group
- problem solving
- providing encouragement.

Monitoring progress may include:

- weekly report

- monthly report
- consultative groups
- occupational health and safety
- union delegates
- financial departments
- public profiles.

Evidence and information may include:

- customer surveys
- employee satisfaction
- industrial disputes
- supplier feedback
- productivity measures
- cost savings
- market share data.

Negotiation skills may include:

- assertiveness
- collaboration
- solution designing
- confidence building
- conflict reduction
- stress management
- empathising.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- analysing and evaluating problems associated with change
- developing processes to introduce change
- establishing plans and schedules to achieve the objectives of change
- presenting information on the causes and introduction of the change
- communicating priorities, goals and objectives
- gathering evidence on the effect of change.

Underpinning knowledge

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- the relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- understanding of common effects of change and innovation in the workplace
- understanding of industrial and organisational context of change
- understanding of organisation's policies, plans, procedures and structure
- knowledge of resources required by the organisation's operations
- understanding processes to interpret and apply feedback

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- knowledge of principles and techniques of goal setting and recording priorities
- Knowledge of the principles of negotiation.

Underpinning skills

- literacy skills to read and understand a variety of texts; prepare general information and papers according to target audience; spell with accuracy; use grammar and punctuation effectively as an aid to understanding
- planning skills to schedule work activities for the implementation of change
- team work skills for working as a member of a team during period of changes
- consultation skills for including stakeholders in the change process
- analytical skills for monitoring outcomes of change
- negotiation skills for dealing with competing objectives
- estimation skills for identifying resources necessary to support introduction of change
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbon and Oil Training Package
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit

Key competencies

- collecting, analysing and organising information (level 2) to set goals and objectives
- communicating ideas and information (level 2) with members of the work team
- planning and organising activities (level 2) to promote change
- working with teams and others (level 2) in completing scheduled tasks
- using mathematical ideas and techniques (level 2) as an aid to measure impact of change
- solving problems (level 2) to diagnose problems of implementation
- using technology (level 2) to manage scheduling of tasks

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	2	2	2

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Unit title

BSBFLM402A Show leadership in the workplace

Unit descriptor

This unit is equivalent to the original unit BSXFMI402A Provide leadership in the workplace.

Frontline management has an important leadership role in the development of the organisation. This will be evident in the way they work with teams and individuals, their standard of conduct and the initiative they take in influencing others. At this level, work will normally be carried out within routine and non-routine methods and procedures which require the exercise of some discretion and judgement.

Consider co-assessment with BSBCMN402A Develop work priorities, BSBFLM403A Manage effective workplace relationships, BSBFLM404A Lead work teams, and BSBFLM406A Implement workplace information system.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Model high standards of management performance and behaviour.	1.1 Management performance and behaviour meets the organisation's requirements 1.2 Management performance and behaviour serves as a positive role model for others 1.3 Performance plans are developed and implemented in accordance with the organisation's goals and objectives 1.4 Key performance indicators are established and used to meet the organisation's goals and objectives.
2. Enhance the organisation’s image.	2.1 The organisation’s standards and values are used in conducting business 2.2 Standards and values considered to be damaging to the organisation are questioned through established communication channels 2.3 Personal performance contributes to developing an organisation which has integrity and credibility.
3. Influence individuals and teams positively.	3.1 Expectations, roles and responsibilities are communicated in a way which encourages individuals/teams to take responsibility for their work 3.2 Individual's/team's efforts and contributions are encouraged, valued and rewarded 3.3 Ideas and information receive the acceptance and support of colleagues.

Element	Performance criteria
4. Make informed decisions.	4.1 Information relevant to the issue(s) under consideration is gathered and organised 4.2 Individuals/teams participate actively in the decision making processes 4.3 Options are examined and their associated risks assessed to determine preferred course(s) of action 4.4 Decisions are timely and communicated clearly to individuals/teams 4.5 Plans to implement decisions are prepared and agreed by relevant individuals/teams 4.6 Feedback processes are used effectively to monitor the implementation and impact of decisions.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

At AQF level 4, frontline management will normally be engaged in a workplace context where they:

- engage in short to medium term planning within the organisation's business plans for example, prepares six monthly plan of the department's productivity targets within the organisation's business plans
- take responsibility for own outputs in relation to specific quality standards for example, assesses own management performance against the organisation's standards of management
- take limited responsibility for the quality and quantity of the output of others for example, using the organisation's performance improvement processes, assists individuals to assess the quality and quantity of their output and to devise appropriate improvement plans
- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts for example, understands the principles and techniques underpinning the development of key performance indicators
- perform varied activities in a wide range of routine and/or non-routine contexts, with knowledge and skill depth in some areas for example, negotiates the services to be provided to an external customer who has needs which are not able to be met within the organisation's standard range of services

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- apply solutions to a defined range of unpredictable problems for example, given the failure of a supplier to provide urgently required computer software, analyses the options and takes appropriate action for a prompt and cost-effective rectification of the problem
- identify, analyse and evaluate information from a variety of sources for example, given feedback from several employees as to ways to up-grade the department's operating procedures and given the organisation's standard documentation, considers the information provided and prepares a recommendation for consultation.

Frontline management at this level normally operate in a relatively simple and routine workplace environment in which they use the organisation's:

- goals, objectives, plans, systems and processes
- quality and continuous improvement processes and standards
- access and equity principles and practice
- business and performance plans
- defined resource parameters
- ethical standards.

Organisation's requirements will be:

- expressed in written documentation and orally. They will normally be expressed in terms of goals, plans, processes and procedures. The requirements also include the culture and standards demonstrated by the organisation.

The organisation's standards and values will be:

- stated or implied by the way the organisation conducts its business.

Colleagues may include:

- team members, employees at the same level and more senior managers, and may include people from a wide variety of social, cultural and ethnic backgrounds. This will usually be from a wider spread of the organisation than at AQF level 3.

Feedback processes may be:

- formal or informal and may be from internal or external sources.

OHS considerations may include:

- implement and monitor OHS procedures in area of responsibility
- leadership in OHS practice as an ethical standard
- OHS hazard identification, risk assessment and control approaches evident in decisions.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- displays high standards of leadership
- demonstrates a positive influence on others
- uses effective consultation processes
- makes soundly researched decisions.

Underpinning knowledge

Underpinning knowledge relates to the essential knowledge and understanding a person needs to perform the work to the required standard.

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- the principles and techniques associated with:
  - leading people
  - preparing performance plans
  - establishing key performance indicators
  - influencing others
  - establishing effective consultative processes
  - making decisions
- the characteristics of a positive role model
- the types of actions which uphold the organisation's image.

Underpinning skills

Functional literacy skills to use written and oral information about workplace requirements:

- communication skills including receiving and analysing feedback and reporting
- accessing and interpreting the organisation's standards and values
- research and analytical skills to interpret data
- planning and organising skills to meet work priorities
- monitoring and introducing practices to improve work performance
- being a positive influence on colleagues
- using information systems to advantage
- using feedback to achieve positive outcomes
- use coaching and mentoring skills to provide support to colleagues
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.

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- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to develop Key Performance Indicators
- communicating ideas and information (level 2) with individuals and members of the work team
- planning and organising activities (level 2) to establish work plans
- working with teams and others (level 2) to implement and monitor performance
- using mathematical ideas and techniques (level 1) as an aid to measure and plan goals
- solving problems (level 2) as part of the decision making process
- using technology (level 1) to aid effective management of information.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	1

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Unit title

BSBFLM403A Manage effective workplace relationships

Unit descriptor

This unit is equivalent to the original unit BSXFMI403A Establish and manage effective workplace relationships.

Frontline management plays an important role in developing and maintaining positive relationships in internal and external environments so that customers, suppliers and the organisation achieve planned outputs/outcomes. At this level, work will normally be carried out within routine and non-routine methods and procedures which require the exercise of some discretion and judgement.

Consider co-assessment with BSBFLM402A Show leadership in the workplace and BSBFLM404A Lead work teams.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Gather, convey and receive information and ideas.	1.1 Information to achieve work responsibilities is collected from appropriate sources 1.2 The method(s) used to communicate ideas and information is appropriate to the audience Communication takes into account social and cultural diversity 1.3 Input from internal and external sources is sought, and valued in developing and refining new ideas and approaches.
2. Develop trust and confidence.	2.1 People are treated with integrity, respect and empathy 2.2 The organisation's social, ethical and business standards are used to develop and maintain positive relationships 2.3 Trust and confidence of colleagues, customers and suppliers is gained and maintained through competent performance 2.4 Interpersonal styles and methods are adjusted to the social and cultural environment.
3. Build and maintain networks and relationships.	3.1 Networking is used to identify and build relationships 3.2 Networks and other work relationships provide identifiable benefits for the team and organisation 3.3 Action is taken to maintain the effectiveness of workplace relationships.

Element	Performance criteria
4. Manage difficulties to achieve positive outcomes.	4.1 Problems are identified and analysed, and action is taken to rectify the situation with minimal disruption to performance 4.2 Colleagues receive guidance and support to resolve their work difficulties 4.3 Poor work performance is managed within the organisation's processes 4.4 Conflict is managed constructively within the organisation's processes 4.5 Difficult situations are negotiated to achieve results acceptable to the participants, and which meet organisation's and legislative requirements.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

At AQF level 4, frontline management will normally be engaged in a workplace context where they:

- engage in short to medium term planning within the organisation's business plans for example, prepares six monthly plan of the department's productivity targets within the organisation's business plans
- take responsibility for own outputs in relation to specific quality standards for example, assesses own management performance against the organisation's standards of management
- take limited responsibility for the quality and quantity of the output of others for example, using the organisation's performance improvement processes, assists individuals to assess the quality and quantity of their output and to devise appropriate improvement plans
- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts for example, understands the principles and techniques underpinning the development of Key Performance indicators
- perform varied activities in a wide range of routine and/or non-routine contexts, with knowledge and skill depth in some areas for example, negotiates the services to be provided to an external customer who has needs which are not able to be met within the organisation's standard range of services

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- apply solutions to a defined range of unpredictable problems for example, given the failure of a supplier to provide urgently required computer software, analyses the options and takes appropriate action for a prompt and cost-effective rectification of the problem
- identify, analyse and evaluate information from a variety of sources for example, given feedback from several employees as to ways to up-grade the department's operating procedures and given the organisation's standard documentation, considers the information provided and prepares a recommendation for consultation.

Frontline management at this level normally operate in a relatively simple and routine workplace environment in which they use the organisation's:

- goals, objectives, plans, systems and processes
- quality and continuous improvement processes and standards
- access and equity principles and practice
- business and performance plans
- defined resource parameters
- ethical standards.

Sources of information may be:

- internal or external and print or non print.

The organisation's social, ethical and business standards refers to:

- those relevant to frontline management's work activities. They may be written or oral, stated or implied.

Colleagues may include:

- team members, employees at the same level and more senior managers, and may include people from a wide variety of social, cultural and ethnic backgrounds. This will usually be from a wider spread of the organisation than at AQF level 3.

Customers and suppliers would typically be from:

- internal sources, although there may be some limited external contact.

Networks may be:

- internal and/or external. They may be with individuals or groups, either through established structures or through unstructured arrangements.

Guidance and support may be:

- provided by frontline management or arranged from alternative internal or external sources.

OHS considerations may include:

- OHS practice as an ethical standard and legislative requirement
- organisation's responsibilities to customers and suppliers
- adjust communication and OHS approach to cater for social and cultural diversity.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- establishes and maintains positive work relationships
- develops trust and confidence
- accesses and analyses information to achieve planned outcomes
- resolves problems and conflicts effectively and efficiently.

Underpinning knowledge

Underpinning knowledge relates to the essential knowledge and understanding a person needs to perform the work to the required standard.

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- the principles and techniques associated with:
  - developing trust and confidence
  - consistent behaviour in work relationships
  - identifying the cultural and social environment
  - establishing networks
  - problem identification and resolution
  - handling conflict
  - managing poor performance at work
- managing relationships to achieve planned outcomes
- monitoring and introducing ways to improve work relationships
- contributing to the elimination of discrimination/bias.

Underpinning skills

- functional literacy skills to access and use workplace information
- communication skills including researching, analysing and interpreting information from a variety of people, reporting
- responding to unexpected demands from a range of people
- using consultative processes effectively
- forging effective relationships with internal and/or external people
- gaining the trust and confidence of colleagues
- dealing with people openly and fairly
- using coaching and mentoring skills to provide support to colleagues
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

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In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to support work responsibilities
- communicating ideas and information (level 2) with individuals and members of work team
- planning and organising activities (level 2) in building networks
- working with teams and others (level 2) to assist improve their performance
- using mathematical ideas and techniques (level 1) to use appropriate calculations to resolve problems
- solving problems (level 2) as an aid to decision making
- using technology (level 2) to assist in the management information.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	2

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Unit title

BSBFLM404A Lead work teams

Unit descriptor

This unit is equivalent to the original unit BSXFMI404A Participate in, lead and facilitate work teams.

This unit covers the skills and knowledge required to lead a team or work group in a business environment. It includes developing plans, providing leadership and supervising the performance of a group.

Consider co-assessment with BSBFLM402A Show leadership in the workplace, BSBFLM403A Manage effective workplace relationships, BSBFLM406A Implement workplace information system, and BSBFLM411A Contribute to the development of a workplace learning environment.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Participate in team planning.	1.1 The manager assists the team to establish its purpose, roles, responsibilities and accountabilities in accordance with the organisation's goals, plans and objectives 1.2 The manager assists the team monitor and adjust its performance within the organisation's continuous improvement policies and processes 1.3 The manager encourages the team to use the competencies of each member for team and individual benefit.
2. Develop team commitment and co-operation.	2.1 The manager assists the team to use open communication processes to obtain and share information 2.2 The team makes decisions in accordance with its agreed roles and responsibilities 2.3 The manager supports the team to develop mutual concern and camaraderie.
3. Manage and develop team performance.	3.1 The results achieved by the team contribute positively to the organisation's business plans 3.2 The manager encourages the team to exploit innovation and initiative 3.3 Team and individual competencies are monitored regularly to confirm that the team is able to achieve its goals 3.4 Team members share and enhance their knowledge and skills.

Element	Performance criteria
4. Participate in and facilitate the work team.	4.1 Team members participate actively in team activities and communication processes 4.2 Individuals and teams take individual and joint responsibility for their actions 4.3 The team receives support to identify and resolve problems which impede its performance.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

At AQF level 4, frontline management will normally be engaged in a workplace context where they:

- engage in short to medium term planning within the organisation's business plans for example, prepares six monthly plan of the department's productivity targets within the organisation's business plans
- take responsibility for own outputs in relation to specific quality standards for example, assesses own management performance against the organisation's standards of management
- take limited responsibility for the quality and quantity of the output of others for example, using the organisation's performance improvement processes, assists individuals to assess the quality and quantity of their output and to devise appropriate improvement plans
- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts for example, understands the principles and techniques underpinning the development of Key Performance indicators
- perform varied activities in a wide range of routine and/or non-routine contexts, with knowledge and skill depth in some areas for example, negotiates the services to be provided to an external customer who has needs which are not able to be met within the organisation's standard range of services
- apply solutions to a defined range of unpredictable problems for example, given the failure of a supplier to provide urgently required computer software, analyses the options and takes appropriate action for a prompt and cost-effective rectification of the problem
- identify, analyse and evaluate information from a variety of sources for example, given feedback from several employees as to ways to up-grade the department's

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operating procedures and given the organisation's standard documentation, considers the information provided and prepares a recommendation for consultation.

Frontline management at this level normally operate in a relatively simple and routine workplace environment in which they use the organisation's:

- goals, objectives, plans, systems and processes
- quality and continuous improvement processes and standards
- access and equity principles and practice
- business and performance plans
- defined resource parameters
- ethical standards.

The manager may:

- adopt a variety of roles in teams including leader, facilitator, participant, coach, mentor.

Teams may be:

- one or a mixture of on-going, work-based, project-based, task specific, or cross-functional. Teams may include full time employees, contractors, part time employees.

The organisation's goals, plans and objectives refers to:

- those relevant to frontline management's work activities and to the teams in which frontline management is involved.

Competencies refer to:

- the abilities of the team members and may be formally recognised or not formally recognised. They may be industry-wide, enterprise specific or individual specific.

Knowledge and skill development may:

- take place through a variety of methods including for example, coaching, mentoring, exchange/rotation, shadowing, action learning, structured training programs.

OHS considerations may include:

- implement and monitor participative arrangements
- information to team about OHS and the organisation's OHS policies, procedures and practices.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- provides leadership to the team
- contributes positively to team performance
- provides coaching and mentoring support.

Underpinning knowledge

Underpinning knowledge relates to the essential knowledge and understanding a person needs to perform the work to the required standard.

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts:

- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- the principles and techniques associated with:
  - the organisation of teams
  - team goal setting
  - devolving responsibility/accountability to teams
  - team dynamics
  - conflict resolution
  - gaining team commitment
  - monitoring and assessing team performance
- gain team commitment to the organisation's goals, values and plans
- the forms of discrimination/bias and how to deal with them.

Underpinning skills

- functional literacy skills to access and use workplace information
- assessing the competence of the team
- facilitating the participation of team members
- working effectively with team members who have diverse work styles, aspirations, cultures and perspectives
- facilitating team development and improvement
- assessing competency development requirements
- gaining the trust and confidence of colleagues
- dealing with people openly and fairly
- using coaching and mentoring skills to provide support to colleagues
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.

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- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to assist team planning
- communicating ideas and information (level 2) with members of work team
- planning and organising activities (level 3) in association with the team
- working with teams and others (level 2) to achieve team goals
- using mathematical ideas and techniques (level 1) to assist the development of team plans
- solving problems (level 3) to assist team performance
- using technology (level 1) to assist in the management information.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	3	2	1	3	1

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Unit title

BSBFLM405A Implement operational plan

Unit descriptor

This unit is equivalent to the original unit BSXFMI405A Manage operations to achieve planned outcomes.

Frontline management is actively engaged in planning, implementing, monitoring and recording performance to achieve the business plans of the team/organisation.
This key role is carried out to provide safe, efficient and effective products and services to customer satisfaction within the organisation's productivity and profitability plans.
At this level, work will normally be carried out within routine and non-routine methods and procedures which require the exercise of some discretion and judgement.

Consider co-assessment with BSBFLM402A Show leadership in the workplace, BSBFLM403A Manage effective workplace relationships, BSBFLM404A Lead work teams, BSBFLM406A Implement workplace information system, BSBCMN411A Monitor a safe workplace, and BSBFLM409A Implement continuous improvement.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Plan resource use.	1.1 Resource information for use in operational plans is collected, analysed and organised in consultation with colleagues and specialist resource managers 1.2 Operational plans contribute to the achievement of the organisation's performance/business plan 1.3 Key performance indicators are developed within operational plans 1.4 Contingency plans are prepared in the event that initial plans need to be varied.
2. Acquire resources.	2.1 Acquire resources 2.2 Employees are recruited and/or inducted within the organisation's human resource management policies and practices 2.3 Physical resources and services are acquired within the organisation's polices, practices and procedures.

Element	Performance criteria
3. Monitor operational performance.	3.1 Performance systems and processes are monitored to assess progress in achieving profit/productivity plans and targets 3.2 Budget and actual financial information is analysed and interpreted to monitor profit/productivity performance 3.3 Unsatisfactory performance is identified and prompt action is taken to rectify the situation 3.4 Mentoring and coaching is provided to support individuals/teams use resources to the required standard 3.5 Recommendations for variation to operational plans are negotiated and approved by the designated persons/groups 3.6 Systems, procedures and records associated with documenting performance are managed in accordance with the organisation's requirements.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include: award and enterprise agreements and relevant industrial instruments

- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

At AQF level 4, frontline management will normally be engaged in a workplace context where they:

- engage in short to medium term planning within the organisation's business plans for example, prepares six monthly plan of the department's productivity targets within the organisation's business plans
- take responsibility for own outputs in relation to specific quality standards for example, assesses own management performance against the organisation's standards of management
- take limited responsibility for the quality and quantity of the output of others for example, using the organisation's performance improvement processes, assists individuals to assess the quality and quantity of their output and to devise appropriate improvement plans
- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts for example, understands the principles and techniques underpinning the development of Key Performance indicators
- perform varied activities in a wide range of routine and/or non-routine contexts, with knowledge and skill depth in some areas for example, negotiates the services to be

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provided to an external customer who has needs which are not able to be met within the organisation's standard range of services
- apply solutions to a defined range of unpredictable problems for example, given the failure of a supplier to provide urgently required computer software, analyses the options and takes appropriate action for a prompt and cost-effective rectification of the problem
- identify, analyse and evaluate information from a variety of sources for example, given feedback from several employees as to ways to up-grade the department's operating procedures and given the organisation's standard documentation, considers the information provided and prepares a recommendation for consultation.

Frontline management at this level normally operate in a relatively simple and routine workplace environment in which they use the organisation's:
- goals, objectives, plans, systems and processes
- quality and continuous improvement processes and standards
- access and equity principles and practice
- business and performance plans
- defined resource parameters
- ethical standards.

Resources may include:
- people, power/energy, information, finance, buildings/facilities, equipment, technology, time.

Operational plans are:
- the short to medium term plans developed by the department/section to describe product/service performance.

The organisation's policies, practices and procedures are:
- those which govern the acquisition of resources, for example, the purchase of equipment.

Colleagues and specialist resource managers may include:
- people at the same level or more senior managers, and may include people from a wide range of social, cultural and ethnic backgrounds. This will usually be from a wider spread of the organisation than at AQF level 3.

Designated persons/groups may include:
- those who have the authority to make decisions and/or recommendations about varying operations.

OHS considerations may include:
- provision of information about OHS and the organisation's OHS policies, procedures and programs
- employee induction
- key performance indicators include OHS
- systems, procedures and records
- organisation's procedures for dealing with hazardous events.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- produces short term plans for department/section
- plans, acquires and uses resources
- monitors and adjusts operational performance
- reports performance.

Underpinning knowledge

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

Underpinning knowledge relates to the essential knowledge and understanding a person needs to perform the work to the required standard.

Underpinning skills

- functional literacy skills to access and use workplace information
- maintaining a safe workplace and environment
- accessing and using feedback to improve operational performance
- preparing recommendations to improve operations
- accessing and using established systems and processes
- using coaching and mentoring skills to provide support to colleagues
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

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Key competencies

- collecting, analysing and organising information (level 2) to acquire information for planning
- communicating ideas and information (level 2) to share information with members of work team
- planning and organising activities (level 2) plan resource usage
- working with teams and others (level 2) to achieve planning outcomes
- using mathematical ideas and techniques (level 1) to carryout calculations associated with resource usage
- solving problems (level 2) to attend to unsatisfactory performance
- using technology (level 2) to assist the management information.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	2

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Unit title

BSBFLM406A Implement workplace information system

Unit descriptor

This unit is equivalent to the original unit BSXFMI406A Manage workplace information.

Frontline management is an important contributor and user of information. Their competency in identifying, acquiring, analysing and using appropriate information plays a significant part in the effectiveness of the organisation's performance. At this level, work will normally be carried out within routine and non-routine methods and procedures which require the exercise of some discretion and judgement.

Consider co-assessment with BSBFLM402A Show leadership in the workplace, BSBFLM405A Implement operational plan, BSBFLM409A Implement continuous improvement, BSBCMN410A Coordinate implementation of customer service strategies and BSBCMN411 Monitor a safe workplace.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Identify and source information needs.	1.1 The information needs of teams is determined and the sources are identified 1.2 Information held by the organisation is acquired and reviewed to determine suitability and accessibility 1.3 Plans are prepared to obtain information which is not available/accessible within the organisation.
2. Collect, analyse and report information.	2.1 Collection of information is timely and relevant to the needs of teams 2.2 Information is in a format suitable for analysis, interpretation and dissemination 2.3 Information is analysed to identify and report relevant trends and developments in terms of the needs for which it was acquired.
3. Use management information systems.	3.1 Management information systems are used effectively to store and retrieve data for decision making 3.2 Technology available in the work area is used to manage information effectively 3.3 Recommendations for improving the information system are submitted to designated persons/groups.

Element	Performance criteria
4. Prepare business plan/budgets.	4.1 Teams are involved in business plans and/or budget preparation in a way which uses their contribution effectively and gains their support for the outcomes 4.2 Business plans and/or budgets are prepared and presented in accordance with the organisation's guidelines and requirements 4.3 Contingency plans are prepared in the event that alternative action is required.
5. Prepare resource proposals	5.1 Resource planning data is collected in consultation with colleagues, including those who have a specialist role in resource management 5.2 Estimates of resource needs and use reflects the organisation's business plans, and customer and supplier requirements 5.3 Proposals to secure resources are supported by clearly presented submissions describing realistic options, benefits, costs and outcomes.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

At AQF level 4, frontline management will normally be engaged in a workplace context where they:

- engage in short to medium term planning within the organisation's business plans for example, prepares six monthly plan of the department's productivity targets within the organisation's business plans
- take responsibility for own outputs in relation to specific quality standards for example, assesses own management performance against the organisation's standards of management
- take limited responsibility for the quality and quantity of the output of others for example, using the organisation's performance improvement processes, assists individuals to assess the quality and quantity of their output and to devise appropriate improvement plans
- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts for example, understands the principles and techniques underpinning the development of Key Performance indicators

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- perform varied activities in a wide range of routine and/or non-routine contexts, with knowledge and skill depth in some areas for example, negotiates the services to be provided to an external customer who has needs which are not able to be met within the organisation's standard range of services
- apply solutions to a defined range of unpredictable problems for example, given the failure of a supplier to provide urgently required computer software, analyses the options and takes appropriate action for a prompt and cost-effective rectification of the problem
- identify, analyse and evaluate information from a variety of sources for example, given feedback from several employees as to ways to up-grade the department's operating procedures and given the organisation's standard documentation, considers the information provided and prepares a recommendation for consultation.

Frontline management at this level normally operate in a relatively simple and routine workplace environment in which they use the organisation's:

- goals, objectives, plans, systems and processes
- quality and continuous improvement processes and standards
- access and equity principles and practice
- business and performance plans
- defined resource parameters
- ethical standards.

Information may be:

- available in writing or verbally, held in computer or in manual systems, available internally or externally.

Technology will be:

- that readily available in the workplace and be appropriate to frontline management's roles and responsibilities.

Designated persons/groups includes:

- those who have the authority to make decisions and/or recommendations about information systems.

Resources may include:

- for example, people, power/energy, information, finance, buildings/facilities, equipment, technology, time.

Colleagues may include:

- team members, employees at the same level or more senior managers, and may include people from a wide variety of social, cultural and ethnic backgrounds. This will normally be a wider group of contacts than at AQF level 3.

OHS considerations include:

- provision of information about OHS and the organisation's OHS policies, procedures and programs
- inclusion of OHS in business plans
- resource proposals address OHS.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- accesses, uses and communicates workplace information
- provides feedback on how to improve the management information system
- researches and prepares financial and resource plans/proposals.

Underpinning knowledge

Underpinning knowledge relates to the essential knowledge and understanding a person needs to perform the work to the required standard.

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts.

- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- the principles and techniques of:
  - workplace information systems
  - business plans/budgets
  - resource proposals
- the basic financial concepts in business plans/budgets
- the methods to gain efficiencies in resource management.

Underpinning skills

- functional literacy skills to access and use workplace information
- communication skills including information collection, analysis and interpretation and reporting
- identifying information requirements of the team
- managing information to achieve goals and results
- researching information
- improving information usage in decision making
- preparing information in a format for use by colleagues
- using coaching and mentoring skills to provide support to colleagues
- accessing technology to extract/input information
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

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Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to contribute to the team's information needs
- communicating ideas and information (level 2) with individuals and members of work team
- planning and organising activities (level 2) use of the management information system
- working with teams and others (level 2) to collect and prepare budget information
- using mathematical ideas and techniques (level 1) to make budget calculations
- solving problems (level 2) to access information not available in the organisation
- using technology (level 1) to assist the management information.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	1

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Unit title

BSBFLM409A Implement continuous improvement

Unit descriptor

This unit is equivalent to the original unit BSXFMI409A Implement and monitor continuous improvement systems and processes.

Frontline management has an active role in managing the continuous improvement process in achieving the organisation's objectives. Their position, closely associated with the creation and delivery of products and services, means that they play an important part in influencing the on-going development of the organisation. At this level, work will normally be carried out within routine and non-routine methods and procedures which require the exercise of some discretion and judgement.

Consider co-assessment with BSBFLM402A Show leadership in the workplace, BSBFLM404A Lead work teams, BSBFLM405A Implement operational plan, BSBFLM407A Supervise quality customer service, BSBCMN411A Monitor a safe workplace, BSBCMN412A Promote innovation and change.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Implement continuous improvement systems and processes.	1.1 The manager actively encourages and supports team members to participate in decision making processes and to assume responsibility and authority 1.2 The organisation's continuous improvement processes are communicated to individuals/teams 1.3 The manager's mentoring and coaching support ensures that individuals/teams are able to implement the organisation's continuous improvement processes.
2. Monitor, adjust and report performance.	2.1 The organisation’s systems and technology are used to monitor progress and to identify ways in which planning and operations could be improved 2.2 Customer service is strengthened through the use of continuous improvement techniques and processes 2.3 Plans are adjusted and communicated to those who have a role in their development and implementation.
3. Consolidate opportunities for further improvement.	3.1 The members are informed of savings and productivity/service improvements in achieving the business plan 3.2 Work performance is documented and the information is used to identify opportunities for further improvement 3.3 Records, reports and recommendations for improvement are managed within the organisation's systems and processes.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:
- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

Customer needs may relate to:
- advice or general information
- specific information
- further information
- making an appointment
- complaints
- purchasing organisation's products and services
- returning organisation's products and services
- accuracy of information
- fairness/politeness
- prices/value.

Communication techniques may include:
- consultation methods, techniques and protocols
- analysing customer satisfaction surveys
- conducting interviews
- questioning
- summarising and paraphrasing
- seeking feedback to confirm understanding
- making recommendations
- obtaining management decisions
- analysing quality assurance data.

Customers can be:
- internal or external
- other agencies
- individual members of the organisation
- corporate customers
- individual members of the public.

Organisational requirements may include:
- quality assurances and/or procedures manuals
- goals, objectives, plans, systems and processes
- legal and organisational policy/guidelines and requirements
- occupational health and safety policies, procedures and programs

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- 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
- defined resource parameters
- who is responsible for products or services
- pricing and discount policies
- replacement and refund policies and procedures
- payment and delivery options.

Business technology may include:
- photocopier
- computer
- printer
- binder
- shredder
- answering machine
- fax machine
- telephone.

Designated individuals and groups may include:
- supervisor
- customers
- colleagues
- external organisation
- committee
- line management.

Procedures to resolve customer difficulties may include:
- using conflict management techniques
- refund of monies
- item replacement
- referrals to supervisor
- review of products or services
- external agencies (eg, Ombudsman).

Customer complaints may include:
- damaged goods or goods not delivered
- administrative errors such as incorrect invoices or prices
- warehouse or store room errors such as incorrect product delivered
- service errors
- delivery errors
- products not delivered on time
- customer satisfaction with service quality.

Coaching and mentoring assistance may include:
- providing feedback to another team member
- fair and ethical practice

- non-discriminatory processes and activities
- respecting the contribution of all participants and giving credit for achievements
- presenting and promoting a positive image of the collective group
- problem solving
- providing encouragement.

Customer service strategies may include:

- delivery times
- price offers
- product/service availability
- product/refund guarantees
- merchandise characteristics
- courtesy/politeness.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- identifying needs and priorities of the organisation in delivering services to customers
- distinguishing between different levels of customer satisfaction
- providing constructive advice on customer service practices
- responding to and reporting on customer feedback
- designing strategies to improve delivery of products and services.

Underpinning knowledge

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts:

- the relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- understanding the principles of customer services
- understanding the organisation's business structure, products and services
- understanding the organisation's policy and procedures for customer service including handling customer complaints
- knowledge of product and service standards and best practice models
- knowledge of common problems relating to customer service
- understanding consultation methods, techniques and protocols
- knowledge of techniques for dealing with customers with special needs.

Underpinning skills

- planning skills to develop implementation schedules
- evaluation skills to assess effectiveness of customer service strategies
- literacy skills to interpret a variety of texts; prepare information and papers; write formal and informal letters according to target audience
- interpersonal skills to relate effectively to people from a range of social, cultural and ethnic backgrounds

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- technology skills including the ability to select and use technology appropriate to a task
- problem solving skills to diagnose organisational problems relating to customer services
- report writing skills to provide recommendations for the enhancement of products or services
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to monitor and report on customer services
- communicating ideas and information (level 2) on products and services
- planning and organising activities (level 2) to enhance products and services
- working with teams and others (level 2) in completing scheduled tasks
- using mathematical ideas and techniques (level 2) to determine service or product costs
- solving problems (level 2) to respond to customer enquiries or complaints
- using technology (level 2) to complete allocated tasks.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	2	2	2

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Unit title

BSZ401A Plan assessment

Unit descriptor

This unit covers the requirements for planning an assessment in a specific context. The unit details the requirements for determining evidence requirements, selecting appropriate assessment methods and developing an assessment tool in a specific context.

Prerequisites

This unit has no prerequisites but has corequisites for the purposes of this Training Package. See under 'Other assessment advice'.

Element	Performance criteria
1. Establish evidence required for a specific context.	1.1 The evidence required to infer competency from the industry/enterprise competency standards, or other standards of performance, is established for a specified context 1.2 Relevant unit(s) of competency are read and interpreted accurately to identify the evidence required 1.3 Specified evidence requirements: • assure valid and reliable inferences of competency • authenticate the performance of the person being assessed and • confirm that competency is current 1.4 Sufficient evidence is specified to show consistent achievement of the specified standards 1.5 The cost of gathering the required evidence is established.
2. Establish suitable assessment method(s).	2.1 Assessment methods are selected which are appropriate for gathering the type and amount of evidence required 2.2 Opportunities to consolidate evidence gathering activities are identified 2.3 Allowable adjustments in the assessment method are proposed to cater for the characteristics of the person(s) being assessed.

Element	Performance criteria
3. Develop assessment tools appropriate to a specific assessment context.	3.1 An assessment tool is developed to gather valid, reliable and sufficient evidence for a specific assessment context 3.2 The assessment tool is designed to mirror the language used to demonstrate the competency in a specific context 3.3 Clear instructions (spoken or written) are prepared including any adjustments which may be made to address the characteristics of the person(s) being assessed 3.4 The assessment tool is checked to ensure flexible, fair, safe and cost-effective assessment occurs.
4. Trial assessment procedure.	4.1 Assessment methods and tools are trialed with an appropriate sample of people to be assessed 4.2 Evaluation of the methods and tools used in the trial provides evidence of clarity, reliability, validity, fairness, cost-effectiveness and ease of administration 4.3 Appropriate adjustments are made to improve the assessment method and tools in light of the trial 4.4 Assessment procedures, including evidence requirements, assessment methods and tools, are ratified with appropriate personnel in the industry/enterprise and/or training organisation where applicable.

Range of variables

Context

Assessment system may be developed by:

- the industry through the endorsed component of Training Package assessment guidelines
- the enterprise
- a Registered Training Organisation
- a combination of the above.

The assessment system should specify the following:

- the purpose of assessment
- competencies required of assessors
- record keeping procedures and policies
- any allowable adjustments to the assessment method which may be made
- the appeal/review mechanisms and procedures
- the review and evaluation of the assessment process
- the linkages between assessment and training qualifications/awards
- employee classification
- remuneration
- progression
- relevant policies
- quality assurance mechanisms

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- apportionment of costs/fees (if applicable)
- marketing/promotion of assessment
- verification arrangements
- auspicing arrangements, if applicable
- partnership arrangements, if applicable.

Specific assessment context may be determined by:

- purpose of the assessment such as:
  - to gain a particular qualification or a licence
  - to determine employee classification
  - to recognise prior learning/current competencies
  - to identify training needs or progress
- location of the assessment such as:
  - on the job or off the job
  - combination of both
- assessment guidelines of the Training Package or other assessment requirements.

Characteristics of persons being assessed may include:

- language, literacy and numeracy needs
- cultural, language and educational background
- gender
- physical ability
- level of confidence, nervousness or anxiety
- age
- experience in training and assessment
- previous experience with the topic.

Appropriate personnel many include:

- assessors
- person(s) being assessed
- employee/union representatives
- consultative committees
- users of assessment information such as training providers, employers, human resource departments
- State/Territory training/recognition authorities
- training and assessment coordinators
- relevant managers/supervisors team leaders
- technical specialists.

Appropriate procedure:

The assessment procedure is developed (and endorsed) by person(s) responsible for the implementation of the assessment process in:

- the industry
- the enterprise
- the training organisation
- a combination of the above.

The assessment procedure should specify the following:

- recording procedure
- appeal/review mechanism
- assessment methods to be used

- instructions/materials to be provided to the person(s) being assessed
- criteria for making decisions of competent or not yet competent
- number of assessors
- assessment tools
- evidence required
- location of assessment
- timing of assessment
- assessment group size
- allowable adjustments to the assessment procedure depending on the characteristics of the person being assessed.

Assessment methods may include:

- direct observation of performance, products, practical tasks, projects and simulation exercises
- review of log books and/or portfolios of evidence
- consideration of third party reports and authenticated prior achievements
- written, oral or computer managed questioning.

These methods may be used in combination in order to provide sufficient evidence to make a judgement.

Assessment tools may include:

- specific instructions to be given relating to the performance of practical tasks or processes or simulation exercises
- specific instructions to be given in relation to the production of projects and exercises
- sets of verbal/written/computer based questions to be asked
- performance checklists
- log books
- descriptions of competent performance.

A number of these tools may be used in combination in order to provide enough evidence to make judgments.

Assessment environment and resources to be considered include:

- time
- location
- personnel
- finances/costs
- equipment
- materials
- OHS requirements
- enterprise/industry standard operating procedures.

Allowable adjustments may include:

- provision of personal support services (eg, Auslan interpreter, reader, interpreter, attendant carer, scribe)
- use of adaptive technology or special equipment (eg, word processor or lifting gear)
- design of shorter assessment sessions to allow for fatigue or medication
- use of large print version of any papers.

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Evidence guide

Assessment context and methods

Assessment should occur on the job or in a simulated workplace. The candidate assessor should use competencies relevant to their area of technical expertise.

Competency in this unit needs to be assessed over a period of time, in a range of contexts and on multiple occasions, involving a combination of direct, indirect and supplementary forms of evidence.

Critical aspects

Assessment requires evidence of the following products to be collected:

- documentation in relation to:
  - specific assessment context, including the purpose of assessment
  - features of the assessment system
  - characteristics of the person being assessed
  - evidence of competency required
  - plan of opportunities for gathering the evidence required
  - assessment methods selected including any allowable adjustments to meet characteristics of person(s) being assessed
- an assessment tool(s) for the specific assessment context which ensures valid, reliable, flexible and fair assessment including any allowable adjustments
- an assessment procedure for the specific context.

Assessment requires evidence of the following processes to be provided:

- how the context of assessment was specified
- how the characteristics of the person(s) being assessed were identified
- why a particular assessment method was selected
- how the assessment was planned to ensure that language, literacy and numeracy issues were taken into consideration
- how evidence was evaluated in terms of validity, authenticity, sufficiency, currency and consistent achievement of the specified standard
- how the assessment tool was developed for the specified context
- how the assessment tool was validated and ratified by appropriate personnel.

Resource implications

Access to relevant competencies, sources of information on assessment methods, assessment tools and assessment procedures.

Access to person(s) wishing to be assessed, any relevant workplace equipment, information and appropriate personnel.

Other assessment advice

Workplace assessors (people who plan, conduct and review assessments leading to a qualification) require:

- BSZ401A Plan assessment
- BSZ402A Conduct assessment
- BSZ403A Review assessment.

These three units together qualify for the relevant statement of attainment under BSZ98 and may also be counted as one unit of competency towards a qualification in PMA02.

Essential knowledge

- knowledge of standards of performance including industry or enterprise competency standards and assessment guidelines.
- knowledge of legal and ethical responsibilities including occupational health and safety regulations and procedures, equal employment and anti-discrimination requirements relevant to the specified context.
- understanding of the assessment principles of reliability, validity, fairness, flexibility, authenticity, sufficiency and consistency.
- knowledge of the assessment guidelines of the Assessment and Workplace Training Training Package.
- skills in the application of various assessment methods, relevant to the workplace context.
- planning of own work including predicting consequences and identifying improvements.
- language, literacy and numeracy skills required to:
  - read and interpret relevant information to plan assessment
  - give clear and precise information/instructions in spoken or written form
  - adjust spoken and written language to suit target audience
  - write assessment tools using language which mirrors the language used to demonstrate the competency in the specific context
  - prepare required documentation using clear and comprehensible language and layout
  - calculate and estimate costs.
- communication skills appropriate to the culture of the workplace and the individual(s).

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Unit title

BSZ402A Conduct assessment

Unit descriptor

This unit covers the requirements for conducting an assessment in a specific context.

Prerequisites

This unit has no prerequisites but has corequisites for the purposes of this Training Package. See under 'Other assessment advice'.

Element	Performance criteria
1. Identify and explain the context of assessment.	1.1 The context and purpose of assessment are discussed and confirmed with the person(s) being assessed 1.2 The relevant performance standards to be used in the assessment (eg, current endorsed competency standards for the specific industry) are clearly explained to the person being assessed 1.3 The assessment procedure is clarified and expectations of assessor and candidate are agreed 1.4 Any legal and ethical responsibilities associated with the assessment are explained to the person(s) being assessed 1.5 The needs of the person being assessed are determined to establish any allowable adjustments in the assessment procedure 1.12 Information is conveyed using language and interactive strategies and techniques to communicate effectively with the person(s) being assessed.
2. Plan evidence gathering opportunities.	2.1 Opportunities to gather evidence of competency which occurs as part of workplace or training activities are identified covering the dimensions of competency 2.2 The need to gather additional evidence which may not occur as part of the workplace or training activities are identified 2.3 Evidence gathering activities are planned to provide sufficient, reliable, valid and fair evidence of competency in accordance with the assessment procedure.

Element	Performance criteria
3. Organise assessment.	3.1 The resources specified in the assessment procedure are obtained and arranged within a safe and accessible assessment environment 3.2 Appropriate personnel are informed of the assessment 3.3 Spoken interactions and any written documents employ language, strategies and techniques to ensure the assessment arrangements are understood by all person(s) being assessed and appropriate personnel.
4. Gather evidence.	4.1 Verbal and non-verbal language is adjusted and strategies are employed to promote a supportive assessment environment to gather evidence 4.2 The evidence specified in the assessment procedure is gathered, using the assessment methods and tools 4.3 Evidence is gathered in accordance with specified allowable adjustments where applicable 4.4 The evidence gathered is documented in accordance with the assessment procedure.
5. Make the assessment decision.	5.1 The evidence is evaluated in terms of: • validity • authenticity • sufficiency • currency • consistent achievement of the specified standard The evidence is evaluated according to the dimensions of competency: • task skills • task management skills • contingency management skills • job/role environment skill • transfer and application of knowledge and skills to new contexts Guidance is sought when in doubt from a more experienced assessor(s) The assessment decision is made in accordance with the criteria specified in the assessment procedure.
6. Record assessment results.	6.1 Assessment results are recorded accurately in accordance with the specified record keeping requirements 6.2 Confidentiality of assessment outcome is maintained and access to the assessment records is provided only to authorised personnel.

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Element	Performance criteria
7. Provide feedback to persons being assessed.	7.1 Clear and constructive feedback in relation to performance is given to the person(s) being assessed using language and strategies to suit the person(s), and guidance on further goals/training opportunities is provided to the person(s) being assessed 7.2 Opportunities for overcoming any gaps in competency, as revealed by the assessment, are explored with the person(s) being assessed 7.3 The person(s) being assessed are advised of available reassessment opportunities and/or review appeal mechanisms where the assessment decision is challenged.
8. Report on the conduct of the assessment.	8.1 Positive and negative features experienced in conducting the assessment are reported to those responsible for the assessment procedure 8.2 Any assessment decision disputed by the person(s) being assessed is recorded and reported promptly to those responsible for the assessment procedure 8.3 Suggestions for improving any aspect of the assessment process are made to appropriate personnel.

Range of variables

Context

Assessment system may be developed by:

- the industry through the endorsed component of Training Package assessment guidelines
- the enterprise
- a Registered Training Organisation
- a combination of the above

The assessment system should specify the following:

- the purpose of assessment
- competencies required of assessors
- record keeping procedures and policies
- any allowable adjustments to the assessment method which may be made
- the appeal/review mechanisms and procedures
- the review and evaluation of the assessment process
- the linkages between assessment and training qualifications/awards
- employee classification
- remuneration
- progression
- relevant policies
- quality assurance mechanisms
- apportionment of costs/fees (if applicable)
- marketing/promotion of assessment

- verification arrangements
- auspicing arrangements, if applicable
- partnership arrangements, if applicable.

Specific assessment context may be determined by:

- purpose of the assessment such as:
  - to gain a particular qualification or a licence
  - to determine employee classification
  - to recognise prior learning/current competencies
  - to identify training needs or progress
- location of the assessment such as:
  - on the job or off the job
  - combination of both
- assessment guidelines of the Training Package or other assessment requirements.

Characteristics of persons being assessed may include:

- language, literacy and numeracy needs
- cultural, language and educational background
- gender
- physical ability
- level of confidence, nervousness or anxiety
- age
- experience in training and assessment
- previous experience with the topic.

Appropriate personnel many include:

- assessors
- person(s) being assessed
- employee/union representatives
- consultative committees
- users of assessment information such as training providers, employers, human resource departments
- State/Territory training/recognition authorities
- training and assessment coordinators
- relevant managers/supervisors team leaders
- technical specialists.

Appropriate procedure

The assessment procedure is developed (and endorsed) by person(s) responsible for the implementation of the assessment process in:

- the industry
- the enterprise
- the training organisation
- a combination of the above.

The assessment procedure should specify the following:

- recording procedure
- appeal/review mechanism
- assessment methods to be used
- instructions/materials to be provided to the person(s) being assessed
- criteria for making decisions of competent or not yet competent

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- number of assessors
- assessment tools
- evidence required
- location of assessment
- timing of assessment
- assessment group size
- allowable adjustments to the assessment procedure depending on the characteristics of the person being assessed.

Assessment methods may include:

- direct observation of performance, products, practical tasks, projects and simulation exercises
- review of log books and/or portfolios of evidence
- consideration of third party reports and authenticated prior achievements
- written, oral or computer managed questioning.

These methods may be used in combination in order to provide sufficient evidence to make a judgement.

Assessment tools may include:

- specific instructions to be given relating to the performance of practical tasks or processes or simulation exercises
- specific instructions to be given in relation to the production of projects and exercises
- sets of verbal/written/computer based questions to be asked
- performance checklists
- log books
- descriptions of competent performance.

A number of these tools may be used in combination in order to provide enough evidence to make judgments.

Assessment environment and resources to be considered include:

- time
- location
- personnel
- finances/costs
- equipment
- materials
- OHS requirements
- enterprise/industry standard operating procedures.

Allowable adjustments may include:

- provision of personal support services (eg, Auslan interpreter, reader, interpreter, attendant carer, scribe)
- use of adaptive technology or special equipment (eg, word processor or lifting gear)
- design of shorter assessment sessions to allow for fatigue or medication
- use of large print version of any papers.

Evidence guide

Assessment context and methods

Assessment should occur on the job or in a simulated workplace. The candidate assessor should use competencies relevant to their area of technical expertise.

Competency in this unit needs to be assessed over a period of time, in a range of contexts and on multiple occasions, involving a combination of direct, indirect and supplementary forms of evidence.

Critical aspects

Assessment requires evidence of the following products to be collected:

- documentation in relation to:
  - specific assessment context, including the purpose of assessment
  - features of the assessment system
  - characteristics of the person being assessed
  - evidence of competency required
  - plan of opportunities for gathering the evidence required
  - assessment methods selected including any allowable adjustments to meet characteristics of person(s) being assessed
- an assessment tool(s) for the specific assessment context which ensures valid, reliable, flexible and fair assessment including any allowable adjustments
- an assessment procedure for the specific context.

Assessment requires evidence of the following processes to be provided:

- how the context of assessment was specified
- how the characteristics of the person(s) being assessed were identified
- why a particular assessment method was selected
- how the assessment was planned to ensure that language, literacy and numeracy issues were taken into consideration
- how evidence was evaluated in terms of validity, authenticity, sufficiency, currency and consistent achievement of the specified standard
- how the assessment tool was developed for the specified context
- how the assessment tool was validated and ratified by appropriate personnel.

Resource implications

Access to relevant competencies, sources of information on assessment methods, assessment tools and assessment procedures.

Access to person(s) wishing to be assessed, any relevant workplace equipment, information and appropriate personnel.

Other assessment advice

Workplace assessors (people who plan, conduct and review assessments leading to a qualification) require:

- BSZ401A Plan assessment
- BSZ402A Conduct assessment
- BSZ403A Review assessment.

These three units together qualify for the relevant statement of attainment under BSZ98 and may also be counted as one unit of competency towards a qualification in PMA02.

Essential knowledge

- knowledge of standards of performance including industry or enterprise competency standards and assessment guidelines.

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- knowledge of legal and ethical responsibilities including occupational health and safety regulations and procedures, equal employment and anti-discrimination requirements relevant to the specified context.
- understanding of the assessment principles of reliability, validity, fairness, flexibility, authenticity, sufficiency and consistency.
- knowledge of the assessment guidelines of the Assessment and Workplace Training Training Package.
- skills in the application of various assessment methods, relevant to the workplace context.
- planning of own work including predicting consequences and identifying improvements.
- language, literacy and numeracy skills required to:
  - read and interpret relevant information to plan assessment
  - give clear and precise information/instructions in spoken or written form
  - adjust spoken and written language to suit target audience
  - write assessment tools using language which mirrors the language used to demonstrate the competency in the specific context
  - prepare required documentation using clear and comprehensible language and layout
  - calculate and estimate costs.
- communication skills appropriate to the culture of the workplace and the individual(s).

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Unit title

BSZ403A Review assessment

Unit descriptor

This unit covers requirements to review assessment procedures in a specific context.

Prerequisites

This unit has no prerequisites but has co-requisites for the purposes of this Training Package. See under 'Other assessment advice'.

Element	Performance criteria
1. Review the assessment procedure(s).	1.1 Appropriate personnel are given the opportunity to review the assessment outcomes and procedure using agreed evaluation criteria 1.2 The review process established by the enterprise, industry or registered training organisation is followed 1.3 The assessment procedure(s) is reviewed at a specified site in cooperation with person(s) being assessed, and any appropriate personnel in the industry/enterprise/training establishment and/or any agency identified under legislation 1.4 Review activities are documented, findings are substantiated and the review approach evaluated.
2. Check consistency of assessment decision.	2.1 Evidence from a range of assessments is checked for consistency across the dimensions of competency 2.2 Evidence is checked against the key competencies 2.3 Consistency of assessment decisions with defined performance standards are reviewed and discrepancies and inconsistencies are noted and acted upon.
3. Report review findings.	3.1 Recommendations are made to appropriate personnel for modifications to the assessment procedure(s) in light of the review outcomes 3.2 Records are evaluated to determine whether the needs of appropriate personnel have been met 3.3 Effective contributions are made to system-wide reviews of the assessment process and feedback procedures, and are reviewed.

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Range of variables

Context

Assessment system may be developed by:

- the industry through the endorsed component of Training Packages Assessment Guidelines
- the enterprise
- a Registered Training Organisation
- a combination of the above

The assessment system should specify the following:

- the purpose of assessment
- competencies required of assessors
- record keeping procedures and policies
- any allowable adjustments to the assessment method which may be made
- the appeal/review mechanisms and procedures
- the review and evaluation of the assessment process
- the linkages between assessment and training qualifications/awards
- employee classification
- remuneration
- progression
- relevant policies
- quality assurance mechanisms
- apportionment of costs/fees (if applicable)
- marketing/promotion of assessment
- verification arrangements
- auspicing arrangements, if applicable
- partnership arrangements, if applicable.

Specific assessment context may be determined by:

- purpose of the assessment such as:
  - to gain a particular qualification or a licence
  - to determine employee classification
  - to recognise prior learning/current competencies
  - to identify training needs or progress
- location of the assessment such as:
  - on the job or off the job
  - combination of both
- assessment guidelines of Training Package or other assessment requirements.

Characteristics of persons being assessed may include:

- language, literacy and numeracy needs
- cultural, language and educational background
- gender
- physical ability
- level of confidence, nervousness or anxiety
- age
- experience in training and assessment
- previous experience with the topic.

Appropriate personnel many include:

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- assessors
- person(s) being assessed
- employee/union representatives
- consultative committees
- users of assessment information such as training providers, employers, human resource departments
- State/Territory training/recognition authorities
- training and assessment coordinators
- relevant managers/supervisors team leaders
- technical specialists.

Appropriate procedure:

The assessment procedure is developed (and endorsed) by person(s) responsible for the implementation of the assessment process in:

- the industry
- the enterprise
- the training organisation
- a combination of the above.

The assessment procedure should specify the following:

- recording procedure
- appeal/review mechanism
- assessment methods to be used
- instructions/materials to be provided to the person(s) being assessed
- criteria for making decisions of competent or not yet competent
- number of assessors
- assessment tools
- evidence required
- location of assessment
- timing of assessment
- assessment group size
- allowable adjustments to the assessment procedure depending on the characteristics of the person being assessed.

Assessment methods may include:

- direct observation of performance, products, practical tasks, projects and simulation exercises
- review of log books and/or portfolios of evidence
- consideration of third party reports and authenticated prior achievements
- written, oral or computer managed questioning.

These methods may be used in combination in order to provide sufficient evidence to make a judgement.

Assessment tools may include:

- specific instructions to be given relating to the performance of practical tasks or processes or simulation exercises
- specific instructions to be given in relation to the production of projects and exercises
- sets of verbal/written/computer based questions to be asked
- performance checklists

- log books
- descriptions of competent performance.

A number of these tools may be used in combination in order to provide enough evidence to make judgments.

Assessment environment and resources to be considered include:

- time
- location
- personnel
- finances/costs
- equipment
- materials
- OHS requirements
- enterprise/industry standard operating procedures.

Allowable adjustments may include:

- provision of personal support services (eg, Auslan interpreter, reader, interpreter, attendant carer, scribe)
- use of adaptive technology or special equipment (eg, word processor or lifting gear)
- design of shorter assessment sessions to allow for fatigue or medication
- use of large print version of any papers.

Evidence guide

Assessment context and methods

Assessment should occur on the job or in a simulated workplace. The candidate assessor should use competencies relevant to their area of technical expertise.

Competency in this unit needs to be assessed over a period of time, in a range of contexts and on multiple occasions, involving a combination of direct, indirect and supplementary forms of evidence.

Critical aspects

Assessment requires evidence of the following products to be collected:

- documentation in relation to:
  - specific assessment context, including the purpose of assessment
  - features of the assessment system
  - characteristics of the person being assessed
  - evidence of competency required
  - plan of opportunities for gathering the evidence required
  - assessment methods selected including any allowable adjustments to meet characteristics of person(s) being assessed
- an assessment tool(s) for the specific assessment context which ensures valid, reliable, flexible and fair assessment including any allowable adjustments
- an assessment procedure for the specific context.

Assessment requires evidence of the following processes to be provided:

- how the context of assessment was specified
- how the characteristics of the person(s) being assessed were identified
- why a particular assessment method was selected

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- how the assessment was planned to ensure that language, literacy and numeracy issues were taken into consideration
- how evidence was evaluated in terms of validity, authenticity, sufficiency, currency and consistent achievement of the specified standard
- how the assessment tool was developed for the specified context
- how the assessment tool was validated and ratified by appropriate personnel.

Resource implications

Access to relevant competencies, sources of information on assessment methods, assessment tools and assessment procedures.

Access to person(s) wishing to be assessed, any relevant workplace equipment, information and appropriate personnel.

Other assessment advice

Workplace assessors (people who plan, conduct and review assessments leading to a qualification) require:

- BSZ401A Plan assessment
- BSZ402A Conduct assessment
- BSZ403A Review assessment.

These three units together qualify for the relevant statement of attainment under BSZ98 and may also be counted as one unit of competency towards a qualification in PMA02.

Essential knowledge

Knowledge of standards of performance including industry or enterprise competency standards and assessment guidelines.

Knowledge of legal and ethical responsibilities including occupational health and safety regulations and procedures, equal employment and anti-discrimination requirements relevant to the specified context.

Understanding of the assessment principles of reliability, validity, fairness, flexibility, authenticity, sufficiency and consistency.

Knowledge of the assessment guidelines of the Assessment and Workplace Training Training Package.

Skills in the application of various assessment methods, relevant to the workplace context.

Planning of own work including predicting consequences and identifying improvements.

Language, literacy and numeracy skills required to:

- read and interpret relevant information to plan assessment
- give clear and precise information/instructions in spoken or written form
- adjust spoken and written language to suit target audience
- write assessment tools using language which mirrors the language used to demonstrate the competency in the specific context
- prepare required documentation using clear and comprehensible language and layout
- calculate and estimate costs.

Communication skills appropriate to the culture of the workplace and the individual(s).

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Unit title

BSZ404A Train small groups

Unit descriptor

This unit covers the requirements for planning, delivering and reviewing training provided for the purposes of developing competency on a one-to-one or small group basis.

This single unit qualifies for the relevant Statement of Attainment under BSZ98 and may also be counted as one unit of competency towards a qualification in PMA02.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Prepare for training.	1.1 Specific needs for training are identified and confirmed through consultation with appropriate personnel 1.2 Training objectives are matched to identified competency development needs 1.3 Training approaches are planned and documented.
2. Deliver training.	2.1 Training is conducted in a safe and accessible environment 2.2 Training delivery methods are selected appropriate to training participant(s) needs, trainer availability, location and resources 2.3 Strategies and techniques are employed which facilitate the learning process 2.4 Objectives of the training, sequence of activities and assessment processes are discussed with training participant(s) 2.5 A systematic approach is taken to training and the approach is revised and modified to meet specific needs of training participant(s).
3. Provide opportunities for practices.	3.1 Practice opportunities are provided to ensure that the participant achieves the components of competency 3.2 Various methods for encouraging learning are implemented to provide diverse approaches to meet the individual needs of participants.

Element	Performance criteria
4. Review training.	4.1 Participants are encouraged to self evaluate performance and identify areas for improvement 4.2 Participants' readiness for assessment is monitored and assistance provided in the collection of evidence of satisfactory performance 4.3 Training is evaluated in the context of self-assessment, participant feedback, supervisor comments and measurements against objectives 4.4 Training details are recorded according to enterprise and legislative requirements 4.5 Results of evaluation are used to guide further training.

Range of variables

Context

Relevant information to identify training needs includes:

- industry/enterprise or other performance competency standards
- endorsed components of relevant industry training package
- industry/workplace training practices
- job descriptions
- results of training needs analyses
- business plans of the organisation which identify skill development requirements
- standard operating and/or other workplace procedures.

Appropriate personnel many include:

- team leaders/supervisors/ technical experts
- managers/employers
- training and assessment coordinators
- training participants
- representative government regulatory bodies
- union/employee representatives
- consultative committees
- assessors.

Training delivery methods and opportunities for practice may include:

- presentations
- demonstrations
- explanations
- problem solving
- mentoring
- experiential learning
- group work
- on the job coaching
- job rotation
- a combination of the above.

Components of competency include:

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- task skills
- task management skills
- contingency management skills
- job/role environment skills
- transfer and application of skills and knowledge of new contents.

Characteristics of training participant may include information in relation to:

- language, literacy and numeracy needs
- cultural, language, and educational background
- gender
- physical ability
- level of confidence, nervousness or anxiety
- age
- previous experience with the topic
- experience in training and assessment.

Training sessions may include:

- one to one demonstration
- small group demonstration (2 to 5 persons).

Resources may include:

- time
- location
- personnel
- materials and equipment
- OHS and other workplace requirements
- enterprise/industry standard operating procedures
- finances/costs.

Strategies and techniques may include:

- active listening
- targeted questioning
- points of clarification
- group discussions.

Evidence guide

Assessment context and methods

Assessment may occur on the job or in a simulated workplace. Candidate workplace trainers should use competencies relevant to their area of technical expertise.

Competency in this unit needs to be assessed over a period of time, in a range of contexts and on multiple occasions, involving a combination of direct, indirect and supplementary forms of evidence.

Critical aspects

Assessment requires evidence of the following products to be collected:

- description of the specific training need and required competency outcomes
- outline of the training approach and steps to be followed
- description of training participant(s) and delivery method(s) to be used
- specific resources required

- outline of the evidence to be collected for monitoring training participant progress
- trainers' self assessment of training delivery
- participant evaluation of training delivery
- evaluation of review comments against plan of training
- records/documentation for monitoring progress of training participant(s).

These products may be collected using proformas or template.

Assessment requires evidence of the following processes to be provided:

- how the specific training need was determined
- how the sequence of the training was determined
- how appropriate personnel were identified
- why particular delivery method(s) were selected
- how the characteristics of training participant(s) were identified
- how the resource requirements were established
- how participant progress was monitored
- why and how the training resources were selected
- appropriate personnel to confirm training arrangements
- how participant(s) were informed of:
  - intended training outcomes
  - competencies to be achieved
  - on and/or off the job practice opportunities
  - benefits of practices
  - learning activities and tasks
  - assessment tasks and requirements
- how constructive feedback was provided to training participant about progress toward competency to be acquired
- how training participant readiness for assessment was determined and confirmed
- how records were maintained to ensure confidentiality, accuracy and security.

Evidence may be provided verbally or in written form.

Resource implications

Access to records system for training, information, and training participants and supervisory staff (where appropriate).

Other assessment advice

This unit may be assessed in conjunction with other units that form part of a job function.

Essential knowledge

- competency in the units being taught
- workplace application of the relevant competencies
- identification of evidence of competency
- planning of own work including predicting consequences and identifying improvements
- application of relevant workplace policies (eg, OHS and EEO) and any relevant legislative or regulatory requirements
- correct use of equipment, and any other processes and procedures appropriate for the training
- ethical handling of performance issues

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- language, literacy and numeracy required skills to:
  - conduct discussions and ask probing questions to review the training
  - gather information (in spoken or written form) for review purposes
  - make verbal recommendations for delivery of future training
  - adjust language to suit target audience (training participant/appropriate personnel)
  - complete records on training
  - provide verbal feedback and report on training outcomes
  - follow and model examples of written texts
  - promote training in verbal or written form
- communication skills appropriate to the culture of the workplace, appropriate personnel and training participants.

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Unit title

PMAOHS502A Contribute to safety case

Unit descriptor

This competency covers the skills and knowledge that is required to contribute to the preparation and presenting of a safety case in accordance with the OHS legislation. The safety case must specify the safety management system followed or to be followed in relation to all hazards in a major hazard facility. The worker is expected to work as part of the team that is made up of senior management, engineers, technical and safety specialists.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Identify and verify issues for presentation.	1.1 Consult with the senior management as well as all relevant departments in a collaborative and objective manner 1.2 Identify and verify issues that are required for the presentation 1.3 Refer to the relevant legislation, and if necessary, clarify requirements from the relevant government departments.
2. Interpret data collected.	2.1 Interpret and analyse data collected 2.2 Use appropriate database for the enterprise to assist in the analysis 2.3 Prepare and distribute analysis and discuss with relevant personnel within the enterprise.
3. Write up a safety case as part of the safety case team.	3.1 Consolidate findings and obtain agreements from relevant personnel as to the information to be included in the case 3.2 Refer to regulatory and format requirements that are stipulated by the authority.
4. Prepare the safety case.	4.1 Prepare the case for submission in accordance with required procedures 4.2 Follow up with the relevant contact in the authority 4.3 Report response from the authority in accordance with enterprise procedures.

Range of variables

Context

This unit of competency describes the requirements applicable for those with responsibilities for preparing and presenting a safety case within the enterprise. This may be as a worker or as an owner of a business.

The competency is to be exhibited within the area of managerial responsibility, which may be an entire enterprise or department of an enterprise. Roles and responsibilities will vary from enterprise to enterprise.

This competency covers process manufacturing plants, which may involve working with machinery, equipment, operational procedures, products or materials, that require the preparation of a safety case as prescribed by the relevant regulations.

The safety management system for a facility must, where relevant, specify:

- the critical equipment (including process equipment, machinery, electrical and instrumentation systems) that relate to, or may effect, the safety of the facility
- the systems in place to ensure that the equipment is fit for the purpose :
  - for which it is used in normal operating conditions
  - to the extent that it is intended to function, or be used, in an emergency.

Enterprise policies and procedures include those that directly or indirectly cover issues relating to incidents, such as:

- hazard policies and procedures
- standard operating procedures
- safety procedures
- work instructions
- emergency, fire and accident procedures
- personal protective clothing and equipment procedures.

Participative arrangements for safety management system may involve:

- following OHS procedures
- information sessions on existing or new issues
- meetings between employer and employees or representatives
- access to relevant workplace information
- use of clear and understandable language.

The safety case to include information regarding:

- person responsible for operation of the facility
- person responsible for the safety case
- a description of the facility
- formal safety assessment of the facility
- the safety management system
- reporting of incidents
- address where records are kept
- safety policy
- organisational structure and responsibilities
- published technical standards applied to or used
- the design, construction, installation, operation and maintenance of the facility, and any modifications to the facility
- the control system to be used for the facility

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- the type of machinery and equipment used at the facility
- the permit to work system
- the emergency response plan in relation to incidents
- the emergency communication system
- the key performance indicators
- the system for incident recording, investigation and reviewing
- training.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency. 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

It is essential that the workplace OHS system and State OHS Acts and regulations be understood and that the importance of critical procedures are known. Competence must be demonstrated in the ability to recognise and analyse potential information and then in preparing appropriate data.

Consistent performance should be demonstrated. In particular look to see if there is a working knowledge of all relevant workplace procedures. Look for knowledge and understanding in relation to:

- consultation processes, either general or specific to occupational health and safety
- training and assignment of staff to safety critical work,
- hazard identification, risk assessment and risk control measures
- the need for specific hazard policies and procedures (eg, housekeeping and inspections)
- new and relevant occupational health and safety information
- incident record keeping
- maintenance of plant and equipment
- purchasing of supplies and equipment.

These aspects may be best assessed using a range of scenarios/case studies/what ifs as the stimulus with a walk through forming part of the response. These 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.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Knowledge and understanding of all workplace systems sufficient to prepare and present relevant data relating to a safety case.

Knowledge is required of relevant acts or regulations specific to the State or Territory (eg, the Victorian Gas Safety (Safety Case) Regulations 1999) in which the relevant facility(s) is located.

Competence includes the ability to:

- apply and describe method for identification of hazards having the potential to cause a incident in the workplace
- locate and understand
  - safety regulations specific to the relevant State or Territory in which each facility is located
  - locate and understand workplace OHS procedures
- apply and explain:
  - other safety management systems and procedures
  - the hierarchy of control (the preferred order of risk control measures from most to least preferred), that is:
    1. elimination
    2. substitution
    3. engineering controls
    4. administrative controls
    5. personal protective equipment.

Key competencies

1	2	3	4	5	6	7
Collect, analyse and organise information	Communicate ideas and information	Plan and organise activities	Work with others and in teams	Use mathematical ideas and techniques	Solve problems	Use technology
3	3	3	3	3	3	3

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Unit title

PMAOHS503A Maintain the workplace OHS management system

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 of employees. It assumes that the OHSMS has been developed by persons with the relevant specialist knowledge and skills.

This unit replaces *PMA500A Manage workplace OHS management system* and *PMA501A Evaluate and improve workplace OHS management system.*

Prerequisites

This unit **has** no prerequisites

Element	Performance criteria
1. Manage OHS information in the workplace	1.13 Take action to ensure that requirements for OHS record keeping and reporting are implemented according to workplace procedures and legislative requirements 1.14 Access sources of OHS information and evaluate for application to the workplace 1.15 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	Performance criteria
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	5.2 Assess compliance of OHSMS with OHS legislation 5.3 Analyse information collected to identify areas for improvement 5.4 Consult with stakeholders, key personnel and, as required, OHS advisors 5.5 Document and communicate outcomes of analysis to key personnel and stakeholders in an easily understood format 5.6 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.

Range of variables

Context

This unit of competency describes OHS requirements applicable for those with managerial responsibilities for maintaining and improving an established OHSMS within the enterprise. 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 enterprise or department of an enterprise. Roles and responsibilities will vary from enterprise to enterprise.

While relevant positions for maintaining and improving the OHSMS will include managers, occupational health and safety 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

This competency covers process manufacturing plants which may involve workplace hazards such as:

- chemicals and hazardous materials

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- 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.

OHS record keeping and reporting requirements include those under:

- Hazardous substances and dangerous goods legislation
- OHS legislation to report serious incidents and injuries and keep records of risk assessments

Other records include:

- Hazard and incident reports, investigation reports
- Completed workplace inspection checklists and reports
- External or internal reports
- Minutes of meetings.

Sources of OHS information may be external and include:

- OHS legislation, codes of practice and Australian and International standards
- OHS regulators and National Occupational Health and Safety Commission
- industry bodies
- internet sites, journals and newsletters
- OHS policies and procedures
- Manufacturers' manuals
- Risk assessments, JSA's, workplace inspections
- MSDSs and registers
- Hazard and incident reports

Evidence guide

Assessment context and methods

The unit 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 timely and practical assessment of parts of this unit of competency. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which may be assessed in a variety of ways including questioning, analysis of data, preparation of reports, minutes of meetings chaired .

Critical aspects

It is essential that the obligations under the state OHS legislation and the workplace OHSMS are understood. Competence must be demonstrated in the ability to interact with the workforce to maintain the process that comprise the OHSMS and to access and analyse information to identify areas for improvement, develop appropriate improvement strategies and apply a quality improvement process to implement and monitor change.

Consistent performance should be demonstrated. In particular 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 occupational health and safety
- hazard identification and risk assessment
- implementation of risk control measures by applying the hierarchy of control
- new and relevant occupational health and safety information
- occupational health and safety record keeping
- OHS issue resolution legislative requirements for consultation prior to the implementation of change
- sources and types if 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.

Resource implications

Assessment will require access to OHS and related data and information together with access, preferably over an extended period of time, to an operating plant and the workgroup. A bank of scenarios/case studies/what ifs and a bank of questions would be useful to probe the reasoning behind the observable actions.

Other assessment advice

It is expected that this competency might be applicable in combination with other industry, occupation or workplace-specific competencies. In all plants it may be appropriate to assess this unit concurrently with relevant teamwork, communication or quality improvement units.

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Essential knowledge

Knowledge and understanding of the workplace OHSMS and State OHS regulations, 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

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	3	3	3

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Unit title

PMAOHS510B Manage risk

Unit descriptor

This unit of competency covers the development, implementation and evaluation of a risk management plan for the organisation. It incorporates an assessment of all potential risks facing the organisation and the development of strategies and plans to mitigate all risk situations through elimination, isolation or protection.

This unit was based on the Australian Risk Management standard AS/NZS4360, 1999 and as such may be applied quite broadly. However, it is probably best applied to health, safety and environment risks and the business and other risks consequent on them. For general business and finance risk units refer to the Finance Training package FNB04.

Prerequisites

This unit **has** the prerequisite of:

- PMAOHS401A Assess risk.

Element	Performance criteria
1. Develop risk management plan.	1.1 Analyse and interpret strategic position and policy on risk management 1.2 Ensure that an audit is conducted to identify risk management context and potential areas of risk 1.3 Analyse organisational capability to reduce/control the likelihood of both incidents and consequences 1.4 Evaluate the risk register to ensure it contains relevant information regarding sources of risk, scenarios for loss of control of the risk, possible consequences, risk controls and action 1.5 Establish or review risk management policies 1.6 Evaluate the requirement for training/education for all groups and individuals 1.7 Identify access to external specialist assistance 1.8 Establish procedures for ongoing identification of hazards, and assessment and control of risk 1.9 Consult stakeholders in the development of the plan

Element	Performance criteria
2. Implement risk management plan.	2.1 Review, in consultation with stakeholders, the ranking of risks and the classifications of levels of risk 2.1 Place on a monitor/review watch list risks classified as low/acceptable 2.2 Implement processes to eliminate wherever practicable risks that are unacceptable 2.3 Implement processes to mitigate/minimise risks that cannot be eliminated in accordance with the risk management plan and the hierarchy of control 2.4 Document strategies for risk minimisation.
3. Evaluate risk management plan.	3.1 Establish procedures to regularly review risk management activities 3.2 Ensure stakeholders have input to the review 3.3 Examine activities that do not achieve their objective/ performance outcomes to determine cause 3.4 Identify targets for improvement and update plan 3.5 Establish evaluation of risk management as a key component of all projects/activities.

Range of variables

Context

Persons and organisations engaged in assessing managers in this unit need to themselves have appropriate qualifications and experience in risk management as well as workplace assessment.

Risk management is the systematic process that is directed towards identifying hazards, assessing the risk and developing controls to minimise the risk and monitor the effectiveness of the controls (and taking action as required).

Relevant groups and individuals refers to those personnel who have knowledge about the issue being dealt with and the expertise to assist the decision making process.

External specialist assistance refers to any group or individual in the community who has the expertise to assist the organisation to deal with any event/incident which may occur.

Risks may include:

- injury or disease
- environmental
- product failure
- financial/economic loss/failure
- damage to property/plant/equipment
- industrial disputes
- professional incompetence
- natural disasters
- security failure (including criminal or terrorist activities)
- equipment/system failures
- political events.

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Legislation, codes and national standards relevant to the workplace may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to OHS, environmental issues, EEO, industrial relations and anti-discrimination
- relevant industry codes of practice.

Risk ranking is a highly subjective process of rating risks according to their severity and likelihood. Common ranking systems are based on matrices or nomograms.

Procedures to review the risk management plan may include:

- internal or external audit
- focus groups
- hazard analysis processes
- investigation reports
- review of data such as hazard and incident reports, maintenance records, production records

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.

Evidence guide

Assessment context and methods

The unit 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 timely assessment of parts of this unit of competency. Simulations may also include the use of case studies/scenarios and role plays. Visits to other workplaces and workgroups may also be useful

This unit of competency requires a significant body of knowledge which may be assessed in a variety of ways including questioning and the use of what if scenarios, discussion groups, review of plans and reports, .

The unit 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 timely and practical assessment of parts of this unit of competency. Simulations may also include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which may be assessed in a variety of ways including questioning, analysis of data, preparation of reports

Critical aspects

Competence must be demonstrated in the ability to develop, implement and evaluate the development of plans to eliminate, isolate or protect people (and/or equipment) in the

event of the potential negative event occurring. The emphasis should be on the ability to avoid/eliminate critical incidents rather than on recovery from a disaster.

Consistent performance should be demonstrated. In particular look for evidence of:

- communication/consultation skills to ensure all relevant groups and individuals are briefed, consulted and have an opportunity to input
- negotiation skills to mediate, negotiate to obtain consensus between individuals/groups on the risk management plan and (where required and appropriate) categorisation of risks
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities
- ability to apply a systematic process to development and documentation of plan and implementation of actions.

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

Resource implications

Assessment will require access to a work group over an extended period of time, or a suitable method of gathering evidence over a range of situations.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant OHS or environmental management units or teamwork and communication units.

Essential 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:
- relevant legislation from all levels of government that effects business operation, especially in regard to OHS and environmental issues, EEO, industrial relations and anti-discrimination
- the legal implications of deeming identified risks as acceptable
- strategic, tactical and operational plans of the organisation
- legal requirements for operating the business relevant to the area of responsibility
- relevant awards and industrial agreements
- workplace standards for OHS and environmental management

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	2	3	2

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Unit title

PMAOMIR512A Establish incident response preparedness and response systems

Unit descriptor

This unit covers the strategic management functions required to develop and establish incident response preparedness and response systems. Using the results of hazard analyses as a starting point, a person would establish an interactive process and manage a collaborative effort which raises the ability of the organisation to respond to an incident.

In a typical scenario a person would gather strategic operational and risk information and translate that into a framework of management and operational systems which enable the organisation's personnel to effectively prepare for and respond to an incident. During development of and on completion of the system the person would liaise with external agencies or mutual assistance partners.

Key features of the competence would be:

- establishment of management and operational systems
- production of written strategies, tactics and procedures
- testing and assessing aspects of the incident response system

The person may:

- identify and familiarise themselves with appropriate and relevant legislation
- consult widely within the organisation
- facilitate and manage the introduction and operation of the system
- facilitate the review of the incident response system

Generally, the person would be part of an incident management team and typically respond to an incident manager. While independent action may sometime be required, the person is expected to liaise, cooperate and consult with other members of the team as necessary.

Prerequisites

This unit **has no** pre-requisites.

Element	Performance criteria
1. Clarify the requirements for incident preparedness and response systems	1.1. Access, interpret and clarify the legislative and statutory requirements and standards related to incident preparedness and response systems. 1.2. Access, interpret and clarify the site requirements relating to systematic analysis of hazards, technical and operational information. 1.3. Consult and collaborate with relevant stakeholders, specialists and emergency services as necessary and in accordance with legislative requirements

Element	Performance criteria
2. Design incident response plans and systems	2.1. Develop an organisational structure for the management of incident preparedness and response from an analysis of relevant technical and operational information 2.2. Establish incident response procedures for management of decision making processes and decision monitoring systems 2.3. Develop incident response procedures for the containment of various types of incidents from an analysis of relevant technical and operational information 2.4. Identify and develop required management and operational systems to support incident preparedness and response in compliance with legislative and site requirements 2.5. Build in processes for evaluation into the plan and system and comply with legislative requirements and/or special site needs 2.6. Ensure all aspects of the plan are consistent with commitments to health, safety and protection of the environment 2.7. Review the plan and systems in conjunction with relevant stakeholders and specialists
3. Manage the implementation of the incident preparedness plan and response systems	3.1. Document and disseminate plans and systems to the appropriate personnel 3.2. Identify required services, personnel, equipment and resources for various types of incidents 3.3. Ensure arrangements are made to ensure required services, personnel, equipment and resources are ready for immediate mobilisation/deployment
4. Ensure periodic and timely evaluation of the incident preparedness plans and response systems	4.1. Encourage, receive and review suggestions and recommendations for changes to incident preparedness plans and response systems and where appropriate, assist implementation 4.2. Initiate and conduct evaluations as prescribed by the plan and in accordance with commitment to health, safety, protection of the environment and legislative requirements

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Range of variables

Context

Incidents may include:

- fire
- explosion
- gas or oil leak
- accident
- bomb threat
- missing personnel
- combination of the above

Management and operational systems to support incident preparedness and response include (but are not limited to):

- evacuation
- emergency operations structure
- communications
- information management
- documentation and reporting requirements
- resource management
- training
- audit and review system
- financial management
- post incident actions

External services may include (but are not limited to):

- fire brigade
- ambulance
- medical services
- local emergency management organisations
- media
- security services
- solicitors
- engineers
- scientists

HSE

All operations to which this unit applies are subject to stringent Health, Safety and Environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities

[NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of ‘what if’ scenarios both in the facility (during demonstration of normal operations and walk throughs of abnormal operations) and off the site.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident.

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

- incident response planning is appropriate for the circumstances
- containment strategies are developed for management of different types of incidents
- understanding of the role of stakeholders and specialists at incidents is demonstrated
- understanding of the structure and roles of on-site functions and personnel is demonstrated
- information gathering, analysis and communication are conducted effectively
- action plan development and evaluation meets organisational requirements
- establishment of incident operations facilities meets organisational requirements
- effective post-incident management planning is undertaken
- evaluations of incident preparedness and response plans are successfully demonstrated

These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

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Resource implications

Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.

Other assessment advice

It may be appropriate to assess this unit concurrently with other relevant units.

Essential knowledge

The knowledge referred to in the evidence guide for this Unit includes:

- incident response and disaster planning processes and techniques
- relevant legislation and standards
- equipment required for different types of equipment
- incident resources and how to access them
- different types of incidents and risks
- hazard identification and control methods and procedures
- risk management principles and techniques
- structure, roles, capabilities and operational limitations of external resources and agencies
- rescue techniques
- intervention and control techniques for heating, fires and explosions
- media policies and procedures
- insurance policies and considerations
- economic impact and considerations

Competence also includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- poorly formulated and developed incident preparedness plans
- inaccurate or misleading site plans
- lack of access to site information and recording systems
- poor hazard identification and control practices
- inaccurate evaluation of systems
- inaccurate or misleading reports
- lack of identified or established site facilities for incident management
- inability to communicate effectively with people personally or through technical devices during incidents
- ineffective of disorganised personnel and resources
- poorly developed action plans
- inappropriate or improper information analyses
- inappropriate or ineffective decisions
- inability to participate as a team member

Key competencies

1 Collect, analyse & organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others & in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	1	3	1

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Unit title

PMAOMIR523A Manage corporate media requirements in a crisis

Unit descriptor

This unit covers the competency required of an individual made responsible for the development of a media strategy, the management of the media and provision of information during a major incident. The person would be a member of the incident management team.

Key aspects of the competence include:

- complying with organisational policies and directions
- presenting potential positive and negative views about newsworthiness of information
- arranging access for media crews and equipment
- identifying opportunities for photographic/film opportunities.

The individual would:

- assist in arranging and managing on-site interviews
- help arrange interviews with particular personnel
- look for and inform media personnel of possible news angles
- assist in the development of positive human interest interviews and stories.

Generally, the individual would be part of a team during an emergency situation though may be required to take independent action. At all times, they would be liaising and cooperating with other members of the team.

This unit is based on, but is not equivalent to, PUACOM009A Manage media requirements at major incidents.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Assess scene and organisation requirements.	1.1. Clearly define restricted and/or special access areas to media personnel to safeguard the operation and prevent contamination of evidence 1.2. Control media access to personnel / volunteers / victims / casualties 1.3. Assess operational responsibilities and provision of information to media.

Element	Performance criteria
2. Develop media strategy.	2.1. Use media plan to form the media strategy 2.2. Allocate media briefing area with required resources where possible 2.3. Gain approval for information releases where appropriate 2.4. Make arrangements to meet media requirements according to incident characteristics and current developments 2.5. Gain media co-operation in order to coordinate information flow and to provide information to the public on matters of safety and public interest.
3. Brief media.	3.1. Select and brief organisational media representative according to availability, knowledge of incident, media presence and role played in the incident 3.2. Change media strategy at any time to suit operational demands and level of incident 3.3. Schedule information briefing sessions and tours at appropriate times in line with operational responsibilities and media requirements 3.4. Provide media personnel and VIP with personal protective clothing or equipment where appropriate.
4. Provide information to media.	4.1. Follow organisational protocols when liaising with the media 4.2. Provide organisational media representative with current developments of incident where appropriate 4.3. Schedule interview and photo opportunities and conduct to provide information where appropriate 4.4. Consult with other organisations at the incident to ensure a consistent presentation of information to the media 4.5. Maintain accurate records of media enquiries and interviews 4.6. Maintain a two-way communication process between organisation and media.
5. Promote the organisation via the media.	5.1. Promote work and achievements of organisation, volunteer and other organisation personnel at incident throughout the incident to assist in maintaining morale and public profile 5.2. Ensure own demeanour and presentation reflects the professional standards of the organisation and support for victims and others affected by the incident.
6. Control hazards associated with media coverage.	6.1. Identify hazards in work environment 6.2. Assess the risks arising from those hazards 6.3. Implement measures to control those risks in line with procedures and duty of care.

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Element	Performance criteria
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.

Range of variables

Context

This unit of competency covers the management of the corporate media response during an incident. The media may include:

- local media (eg. newspapers, radio and local news sheets)
- national media (eg. newspapers, magazines, TV, radio)
- news personnel (eg. reporters, photographers, TV crews)

It includes all such items of equipment and workplace operations which form part of the incident response system. This may include:

- personal protective equipment
- communication equipment (eg. telephones, facsimiles, tape recorders, cameras).

Typical problems for your facility may include:

- unauthorised access to hazardous areas
- corporate representatives and what they say
- dealing with uncooperative media
- communication breakdowns
- incorrect or misleading information.

HSE

All operations to which this unit applies are subject to stringent Health, Safety and Environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and

application of the unit to ensure compliance however, remains with the individual organisation.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident.

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

- incident responses are in accordance with company procedures
- correct incident response equipment (where required) is used appropriately
- actions taken do not inhibit incident response effectiveness or further contribute to the incident
- appropriate documentation including reports, journal entries, logs and/or clearances are completed in accordance with procedures

These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

Resource implications

Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all workplace environments it may be appropriate to assess this unit concurrently with relevant units.

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Essential knowledge

The knowledge referred to in the evidence guide for this Unit includes:

- dealing with the media
- access to key operational information concerning the incident
- key contact details (eg. emergency hotline numbers)
- potential and actual road closure details
- factors behind facility closures
- issued warnings, danger zones and evacuation details
- procedures and company policies concerning persons police are seeking to interview
- company policy on public information/assurance

Competence also includes the ability to isolate the causes of issues within the incident response system and to be able to distinguish between causes of issues indicated by:

- media entering or encroaching on hazardous areas
- media organisations using unauthorised contacts with emergency personnel
- lack of cooperation by the media with the company
- premature release of details concerning evidence or about incident victims
- failures to adhere to company policies and/or guidelines for media communication

Key competencies

1 Collect, analyse & organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others & in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	2	2	1	2	2

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Unit title

PMAOMIR575A Coordinate welfare support activities in response to an incident

Unit descriptor

This unit covers the competencies required by a person to oversee and coordinate all welfare support activities in response to an incident. It involves setting up the necessary logistics and ensuring that work is carried out in accordance with legislation, Company welfare program and associated procedures.

Key aspects of the competence include:

- establishing effective welfare support systems
- ensuring that welfare support systems are effective in operation and focus
- establishing workable linkages between welfare and other aspects of organisational life

The person may:

- deal sympathetically with family members
- ensure that family members are aware of the range of support services available
- assist family members to obtain those services
- make recommendations to the organisation concerning changes or improvements to the system

The person would typically be a member of a senior management team during an incident situation. While there may be occasion to act independently, he/she is expected to liaise with other members of the team as necessary.

Prerequisites

This unit **has no** pre-requisites.

Element	Performance criteria
1. Notify families of those effected by the incident	1.1. Ascertain details and circumstances and state of affected employees affected by the incident 1.2. Accurately and promptly relay relevant information to families of affected employees 1.3. Supply appropriate and timely situational reports when necessary
2. Set up logistical support required for carrying out welfare support activities	2.1. Determine the logistical requirements to effectively carry out welfare support activities 2.2. Acquire and set up logistical requirements in accordance with procedures
3. Co-ordinate and ensure that welfare support activities are conducted appropriately	3.1. Ensure that all workers conduct welfare support activities in accordance with procedures, reflect a sensitivity to the needs of those affected by the incident and promote a positive image of the Company 3.2. Co-ordinate proper documentation of results of welfare support activities

Element	Performance criteria
4. Respond to issues arising from welfare support activities	4.1. Determine issues arising from welfare support activities 4.2. Address issues when within the area of responsibility 4.3. Relay issues outside the area of responsibility to the appropriate personnel for action 4.4. Follow through issues until final resolution has been reached 4.5. Maintain communication with appropriate personnel or persons regarding the progress and/or resolution of issues
5. Contribute to the evaluation of the Company welfare support activities	5.1. Conduct consultations to assess the effectiveness of welfare support activities 5.2. Provide input/feedback to the appropriate personnel for evaluation of Company welfare support activities

Range of variables

Context

Logistical requirements may include:

- call centre
- setting up a team of appropriate workers to assist
- quick access to relevant files and documents
- arrangements with external agencies
- financial requirements

HSE

All operations to which this unit applies are subject to stringent Health, Safety and Environment requirements, which may be imposed through State or Federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

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Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include walk throughs of the relevant competency components and may include the use of case studies/scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident.

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

- assessment of logistical requirements is based on a sound understanding of welfare support activities
- acquisition or setting up of logistical requirements is in accordance with procedures
- steps are taken to ensure that all welfare support activities are in accordance with procedures and promote a positive image of the Company
- appropriate consultations with team members or appropriate personnel are conducted as necessary
- issues arising from welfare support activities within area of responsibility are resolved appropriately
- issues outside of area of responsibility arising from welfare support activities are referred to appropriate personnel and followed through until resolution has been reached
- actions taken do not inhibit recent incident response effectiveness or further contribute to the incident
- the safety and/or successful recovery of persons affected by the incident is afforded priority in the actions taken
- appropriate documentation including reports, journal entries, logs and/or clearances are completed in accordance with procedures

These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

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Resource implications

Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.

Other assessment advice

In all environments it may be appropriate to assess this unit concurrently with relevant units.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- company incident response structures and operations
- one's role within the incident response structure, including its parameters, boundaries and/or limitations
- company welfare program and associated procedures
- company's legal responsibilities to those affected by the incident
- rights and responsibilities of those affected by the incident
- company security, confidentiality and communication requirements
- reporting procedures of the organisation

Competence also includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- Lack of effective communication with family members
- Confusion or misunderstandings concerning welfare service provision
- Contradictory or misleading information
- Internal confusion or obfuscation by sectors of the organisation

Key competencies

1 Collect, analyse & organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others & in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	1	3	1

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Unit title

PMASUP520A Review procedures to minimise environmental impact of process

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.

Prerequisites

This unit **has** the prerequisite of:

- PMASUP320A Implement and monitor environmental policies.

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 implement changes in the management of environmental records.

Range of variables

Context

This competency covers process manufacturing plants which may involve workplace hazards such as:

- chemicals and hazardous materials
- gases and liquids under pressure
- materials handling.

This competency unit includes:

- legislation, codes and national standards relevant to the workplace which may include:
  - award and enterprise agreements and relevant industrial instruments
  - relevant legislation from all levels of government that effects business operation, especially in regard to OHS, environmental issues and industrial relations
  - relevant industry codes of practice
- awareness of the environment and the effects on the environment of the organisation's:
  - liquid waste
  - solid waste
  - gas/fume/vapour/smoke emissions, including fugitive emissions
  - hazardous materials
  - excessive energy and water use
  - excessive noise

and the workplace practices that can be used to minimise or prevent these effects.

Information may include:

- organisational policies and procedures
- relevant environmental legislation/regulation requirements
- licence conditions
- environmental treaties, conventions and national policies and strategies
- National Pollutant Inventory
- State of the Environment reports
- voluntary environmental agreements entered into with external organisations/authorities
- continuous improvement policies and processes for the organisation.

Work group may include:

- formal or unstructured groups
- two or more people.

Proactive environmental management may include:

- resource conservation and efficiency
- minimisation of waste
- recycling
- reduction in use of non-renewable resources
- maximisation of product yield from raw materials
- reduction in volume of pollutants made
- reduction in concentration/intensity of pollutants made

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- reduction in emissions.

Some approaches to proactive environmental management may include:

- preventing and minimising the production of pollution (eg, discharges to air, land and water, hazardous waste)
- improving housekeeping (eg, using a broom instead of a hose, using old rags for cleaning instead of toxic cleaners or water)
- substituting materials (eg, replacing toxic solvent based coatings with water based ones)
- changing processes (eg, mechanical cleaning, re-design of products/ procedures so that materials are used more efficiently).

Environmental management policies must be appropriate to the scope and scale of the enterprise and may include:

- environmental load reduction and waste minimisation
- tenders for the provision of goods and services that specify environmentally preferred selection criteria
- protection of land and habitat
- environmentally sustainable work practices.

Typical functions may include:

- 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.

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.

Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency. 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

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.

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.

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork units, communication units and units relevant to the process equipment.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS400 Contribute to workplace OHS management system
- PMAOHS401 Assess risk.

Essential 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

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- external licensing requirements such as:
- EPA
- water authorities
- local councils
- enterprise procedures and practices.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	3	3	3

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Unit title

PMASUP540A Analyse equipment performance

Unit descriptor

This competency covers the analysis of the performance, and performance verification, of existing equipment. This competency is typically performed by a senior technician who will take the lead in the data gathering phase and then analyses the data.

This competency applies to technicians who will set up and operate performance verification trials and then analyse the results to determine actual compared to theoretical performance of equipment and equipment components. It includes:

- calculating the theoretical performance of an item of equipment
- gathering data to determine the actual performance of the item of equipment
- calculation of actual versus theoretical performance
- making recommendations as to the appropriate action to be taken based on the performance verification results.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Determine theoretical performance.	1.1 Identify item of plant or equipment to be analysed 1.2 Locate and interpret design specification 1.3 Identify process materials being processes/to be processed during verification trial 1.4 Determine process material properties under process conditions 1.5 Calculate theoretical performance of component(s) with that material under those conditions.
2. Conduct trial.	2.1 Design verification trial to be compatible with theoretical analysis 2.2 Determine measurements needed from trial to yield required data 2.3 Select equipment suitable to give required measurements 2.4 Arrange for verification trial with relevant process personnel 2.5 Set up required measurement equipment 2.6 Supervise trial and ensure trial conditions are appropriate 2.7 Collect trial data for analysis.
3. Verify performance of plant/equipment.	3.1 Compare theoretical with actual performance 3.2 Determine significance of variation between theoretical and actual performance 3.3 Investigate any suspicious results and take appropriate action.

Element	Performance criteria
4. Recommend required action.	4.1 Determine appropriate action to bring performance to desired level 4.2 Initiate the corrective action in accordance with company procedures. 4.3 Determine measures to increase equipment productivity 4.4 Recheck performance after corrective action is implemented.

Range of variables

This competency unit includes the analysis of plant, equipment and equipment components. This competency applies to all work environments and sectors within the chemical, hydrocarbons and oil refining industry, but does require both a theoretical/ mathematical and a practical analysis of the process.

The competency does not require a knowledge of industry sectors and materials other than that in which the technician works. It assumes an understanding of the operation of all relevant equipment and processes but does not necessarily require them to be used personally.

Typical problems include:

- worn equipment/components
- validation of new equipment/components to design specification
- performance analysis in order to upgrade process performance.

Evidence guide

Assessment context and methods

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

Assessment might typically be by an analysis project.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what if scenarios both on the plant and off the plant.

Critical aspects

Competence must be demonstrated in the ability to carry out the analysis without undue disruption to the process.

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

- trial design is appropriate
- data taken during trial matches that required for the analysis
- the analysis is carried out in a structured manner
- recommended changes can be justified based on the comparison of trial and theoretical data.

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Resource implications

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of projects will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS401A Assess risk.

Essential knowledge

Knowledge and understanding of the materials, equipment and process sufficient to predict their interactions and their impacts on performance.

Knowledge of the enterprise's procedures and policies along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Competence includes the ability for the practical completion of the job to:

- calculate equipment and component performance from the design specification
- determine equipment and design performance from practical trials
- determine the 'limiting component' in the performance of an item of equipment or a process
- determine possible performance of an item of equipment/process if practical improvements were made to the 'limiting item'.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	3	3	3

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Unit title

BSBFLM504A Facilitate work teams

Unit descriptor

This unit is equivalent to the original unit BSXFMI504A Participate in, lead and facilitate work teams.

Frontline management has a key role in leading, participating in, facilitating and empowering work teams/groups within the context of the organisation. They play a prominent part in motivating, mentoring, coaching and developing team members, and in achieving team cohesion. At this level, work will normally be carried out within complex and diverse methods and procedures which require the exercise of considerable discretion and judgement, using a range of problem solving and decision making strategies.

Consider co-assessment with BSBFLM511A Develop a workplace learning environment.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Participate in team planning.	1.1 The manager assists the team to establish its purpose, roles, responsibilities and accountabilities in accordance with the organisation's goals, plans and objectives 1.2 The manager assists the team monitor and adjust its performance within the organisation's continuous improvement policies and processes 1.3 The manager encourages the team to use the competencies of each member for team and individual benefit.
2. Develop team commitment and co-operation.	2.1 The manager assists the team to use open communication processes to obtain and share information 2.2 The team makes decisions in accordance with its agreed roles and responsibilities 2.3 The manager supports the team to develop mutual concern and camaraderie.
3. Manage and develop team performance.	3.1 The results achieved by the team contribute positively to the organisation's business plans 3.2 The manager encourages the team to exploit innovation and initiative 3.3 Team and individual competencies are monitored regularly to confirm that the team is able to achieve its goals 3.4 Team members share and enhance their knowledge and skills.

Element	Performance criteria
4. Participate in and facilitate the work team.	4.1 Team members participate actively in team activities and communication processes 4.2 Individuals and teams take individual and joint responsibility for their actions 4.3 The team receives support to identify and resolve problems which impede its performance.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

At AQF level 5, frontline management will normally be engaged in a workplace context where they:

- engage in tactical and operational planning within the organisation's strategic plans for example, prepares an annual tactical plan for a department
- take responsibility for own outputs in relation to broad quantity and quality parameters for example, evaluates own annual performance against personal work plans and the organisation's standards
- take limited responsibility for the achievement of group outcomes for example, reviews group performance against plans and prepares in consultation with the group a performance improvement strategy
- demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas for example, understands in depth the principles and techniques of performance management
- transfer and apply theoretical concepts and/or technical or creative skills to a range of situations for example, researches, negotiates and establishes protocols for customer service for the department
- analyse and plan approaches to technical problems or management requirements for example, given the work team's inability to achieve planned outcomes/outputs, analyses the team's performance and develops strategies with the team to rectify the situation
- evaluate information using it to forecast for planning or research purposes for example, the organisation's goals and strategic and tactical plans are analysed in preparation for the preparation of the department's annual operational plan.

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Frontline management at this level normally operate in a relatively diverse and complex workplace environment in which they use the organisation's:

- goals, objectives, plans, systems and processes
- quality and continuous improvement processes and standards
- access and equity principles and practice
- business and performance plans
- defined resource parameters
- ethical standards.

They may use legislation, codes and national standards relevant to the workplace including:

- award and enterprise agreements
- commonwealth and state/Territory legislative requirements especially in regard to occupational health and safety
- industry codes of practice.

The manager may

- adopt a variety of roles in teams including leader, facilitator, participant, coach, mentor.

Teams may be

- one or a mixture of on-going, work-based, project-based, task specific, or cross-functional. Teams may include full time employees, contractors, part time employees.

The organisation's goals, plans and objectives refers to

- those relevant to frontline management's work activities and to the teams in which frontline management is involved.

Competencies refer to:

- the abilities of the team members and may be formally recognised or not formally recognised. They may be industry-wide, enterprise specific or individual specific.

Knowledge and skill development may:

- take place through a variety of methods including for example, coaching, mentoring, exchange/rotation, shadowing, action learning, structured training programs.

OHS considerations may include:

- establish and maintain participative arrangements
- information to team about OHS and the organisation's OHS policies, procedures and practices.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- provides leadership to the team
- contributes positively to team performance
- provides coaching and mentoring support.

Underpinning knowledge

Underpinning knowledge relates to the essential knowledge and understanding a person needs to perform the work to the required standard.

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts with substantial depth in some areas:

- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- the principles and techniques associated with:
  - the organisation of teams
  - team goal setting
  - devolving responsibility/accountability to teams
  - team dynamics
  - conflict resolution
  - gaining team commitment
  - monitoring and assessing team performance
- gain team commitment to the organisation's goals, values and plans
- the forms of discrimination/bias and how to deal with them.

Underpinning skills

- functional literacy skills to access and use workplace information
- assessing the competence of the team
- facilitating the participation of team members
- working effectively with team members who have diverse work styles, aspirations, cultures and perspectives
- facilitating team development and improvement
- assessing competency development requirements
- gaining the trust and confidence of colleagues
- dealing with people openly and fairly
- using coaching and mentoring skills to provide support to colleagues
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.

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- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to assist team planning
- communicating ideas and information (level 2) with members of work team
- planning and organising activities (level 3) in association with the team
- working with teams and others (level 3) to achieve team goals
- using mathematical ideas and techniques (level 1) to assist the development of team plans
- solving problems (level 3) to assist team performance
- using technology (level 2) to assist in the management information.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	3	3	1	3	2

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Unit title

BSBFLM505A Manage operational plan

Unit descriptor

This unit is equivalent to the original unit BSXFMI505A Manage operations to achieve planned outcomes.

Frontline management is actively engaged in planning, implementing, monitoring and recording performance to achieve the business plans of the team/organisation. This key role is carried out to provide safe, efficient and effective products and services to customer satisfaction within the organisation's productivity and profitability plans. At this level, work will normally be carried out within complex and diverse methods and procedures which require the exercise of considerable discretion and judgement, using a range of problem solving and decision making strategies.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Plan resource use.	1.1 Resource information for use in operational plans is collected, analysed and organised in consultation with colleagues and specialist resource managers 1.2 Operational plans contribute to the achievement of the organisation's performance/business plan 1.3 Key performance indicators are developed within operational plans 1.4 Contingency plans are prepared in the event that initial plans need to be varied.
2. Acquire resources.	2.1 Employees are recruited and/or inducted within the organisation's human resource management policies and practices 2.2 Physical resources and services are acquired within the organisation's polices, practices and procedures.
3. Monitor operational performance.	3.1 Performance systems and processes are monitored to assess progress in achieving profit/productivity plans and targets 3.2 Budget and actual financial information is analysed and interpreted to monitor profit/productivity performance 3.3 Unsatisfactory performance is identified and prompt action is taken to rectify the situation 3.4 Mentoring and coaching is provided to support individuals/teams use resources to the required standard 3.5 Recommendations for variation to operational plans are negotiated and approved by the designated persons/groups 3.6 Systems, procedures and records associated with documenting performance are managed in accordance with the organisation's requirements.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

Resources may include:

- people, power/energy, information, finance, buildings/facilities, equipment, technology, time.

Operational plans are:

- the short to medium term plans developed by the department/section to describe product/service performance.

The organisation's policies, practices and procedures are:

- those which govern the acquisition of resources, for example, the purchase of equipment.

Colleagues and specialist resource managers may include:

- people at the same level or more senior managers, and may include people from a wide range of social, cultural and ethnic backgrounds. This will usually be from a wider spread of the organisation than at AQF level 3.

Designated persons/groups may include:

- those who have the authority to make decisions and/or recommendations about varying operations.

OHS considerations may include:

- provision of information about OHS and the organisation's OHS policies, procedures and programs
- employee induction
- key performance indicators include OHS
- systems, procedures and records
- organisation's procedures for dealing with hazardous events.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

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Critical aspects of evidence

- produces short term plans for department/section
- plans, acquires and uses resources
- monitors and adjusts operational performance
- reports performance.

Underpinning knowledge

Underpinning knowledge relates to the essential knowledge and understanding a person needs to perform the work to the required standard.

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts:

- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- the principles and techniques of:
  - planning operations
  - resource planning
  - resource management systems
  - budgeting and financial analysis and interpretation
  - monitoring performance
  - reporting performance
  - problem identification and resolution
- alternative approaches to improving resource usage and eliminating resource inefficiencies and waste
- ways of supporting individuals/teams who have difficulty in performing to the required standard.

Underpinning skills

- functional literacy skills to access and use workplace information
- maintaining a safe workplace and environment
- accessing and using feedback to improve operational performance
- preparing recommendations to improve operations
- accessing and using established systems and processes
- using coaching and mentoring skills to provide support to colleagues
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to acquire information for planning
- communicating ideas and information (level 2) to share information with members of work team
- planning and organising activities (level 3) plan resource usage
- working with teams and others (level 3) to achieve planning outcomes
- using mathematical ideas and techniques (level 2) to carryout calculations associated with resource usage
- solving problems (level 2) to attend to unsatisfactory performance
- using technology (level 2) to assist the management information.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	3	3	2	2	2

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Unit title

BSBFLM509A Promote continuous improvement

Unit descriptor

This unit is equivalent to the original unit BSXFMI509A Implement and monitor continuous improvement systems and processes.

Frontline management has an active role in managing the continuous improvement process in achieving the organisation's objectives. Their position, closely associated with the creation and delivery of products and services, means that they play an important part in influencing the on-going development of the organisation. At this level, work will normally be carried out within complex and diverse methods and procedures which require the exercise of considerable discretion and judgement, using a range of problem solving and decision making strategies.

Consider co-assessment with BSBFLM504A Facilitate work teams, BSBFLM505A Manage operational plan, BSBFLM510A Facilitate and capitalise on change and innovation, and BSBFLM511A Develop a workplace learning environment.

Prerequisites

This unit **has no** prerequisties.

Element	Performance criteria
1. Implement continuous improvement systems and processes.	1.1 The manager actively encourages and supports team members to participate in decision making processes and to assume responsibility and authority 1.2 The organisation's continuous improvement processes are communicated to individuals/teams 1.3 The manager's mentoring and coaching support ensures that individuals/teams are able to implement the organisation's continuous improvement processes.
2. Monitor, adjust and report performance.	2.1 The organisation’s systems and technology are used to monitor progress and to identify ways in which planning and operations could be improved 2.2 Customer service is strengthened through the use of continuous improvement techniques and processes 2.3 Plans are adjusted and communicated to those who have a role in their development and implementation.
3. Consolidate opportunities for further improvement.	3.1 The members are informed of savings and productivity/service improvements in achieving the business plan 3.2 Work performance is documented and the information is used to identify opportunities for further improvement 3.3 Records, reports and recommendations for improvement are managed within the organisation's systems and processes.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

At AQF level 5, frontline management will normally be engaged in a workplace context where they:

- engage in tactical and operational planning within the organisation's strategic plans for example, prepares an annual tactical plan for a department
- take responsibility for own outputs in relation to broad quantity and quality parameters for example, evaluates own annual performance against personal work plans and the organisation's standards
- take limited responsibility for the achievement of group outcomes for example, reviews group performance against plans and prepares in consultation with the group a performance improvement strategy
- demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas for example, understands in depth the principles and techniques of performance management
- transfer and apply theoretical concepts and/or technical or creative skills to a range of situations for example, researches, negotiates and establishes protocols for customer service for the department
- analyse and plan approaches to technical problems or management requirements for example, given the work team's inability to achieve planned outcomes/outputs, analyses the team's performance and develops strategies with the team to rectify the situation
- evaluate information using it to forecast for planning or research purposes for example, the organisation's goals and strategic and tactical plans are analysed in preparation for the preparation of the department's annual operational plan.

Frontline management at this level normally operate in a relatively diverse and complex workplace environment in which they use the organisation's:

- goals, objectives, plans, systems and processes
- quality and continuous improvement processes and standards
- access and equity principles and practice
- business and performance plans
- defined resource parameters
- ethical standards.

They may use legislation, codes and national standards relevant to the workplace including:

- award and enterprise agreements

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- commonwealth and state/Territory legislative requirements especially in regard to occupational health and safety
- industry codes of practice.

Technology will be
- that readily available in the workplace and will be appropriate to frontline management's roles and responsibilities.

Customer service may be
- internal or external, to existing or new clients.

OHS considerations may include:
- implement and monitor participative arrangements for the management of OHS
- delegation and reporting complies with requirements of OHS legislation
- the continuous improvement processes of any OHS management system are established and maintained.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- adjusts plans, processes and procedures to improve performance
- supports others to implement the continuous improvement system/processes
- identifies opportunities for further improvement.

Underpinning knowledge

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts, with substantial depth in some areas.

Underpinning knowledge relates to the essential knowledge and understanding a person needs to perform work to the required standard.

- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- the principles and techniques associated with:
  - continuous improvement systems and processes
  - benchmarking
  - best practice
- the benefits of continuous improvement
- the quality approaches which the organisation may implement
- the methods that can be used in continuous improvement
- the barriers to continuous improvement
- the organisation's recording, reporting and recommendation processes to facilitate continuous improvement.

Underpinning skills

- functional literacy skills to access and use workplace information
- communication skills including researching, analysing and interpreting information from a variety of people and reporting
- monitoring and evaluating systems, processes and procedures
- gaining the commitment of individuals/teams to continuous improvement
- consolidating opportunities for improvement
- dealing with people openly and fairly
- using consultation skills effectively
- using coaching and mentoring skills to provide support to colleagues
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to be used in continuous improvement processes
- communicating ideas and information (level 2) to individuals and work team about the organisation's continuous improvement processes
- planning and organising activities (level 3) for arranging continuous improvement program
- working with teams and others (level 3) to gain team feedback on further improvement initiatives
- using mathematical ideas and techniques (level 1) to complete calculations associated with work improvement
- solving problems (level 2) as an aid to investigating problems with introducing improvements
- using technology (level 2) to complete allocated tasks.

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1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	3	3	2	2	2

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Unit title

BSBFLM510A Facilitate and capitalise on change and innovation

Unit descriptor

This unit is equivalent to the original unit BSXFMI510A Facilitate and capitalise on change and innovation.

Frontline management has an active role in fostering change and acting as a catalyst in the implementation of change and innovation. They have a creative role in ensuring that individuals, the team and the organisation gain from change; and that the customer benefits through improved products and services. At this level, work will normally be carried out within complex and diverse methods and procedures which require the exercise of considerable discretion and judgement, using a range of problem solving and decision making strategies.

Co assessed units: Opportunities for co-assessment are encouraged as part of the holistic approach promoted in the assessment guidelines. In the case of this unit consideration could be given to co-assessing in part or whole with:

Consider co-assessment with BSBFLM504A Facilitate work teams, BSBFLM505A Manage operational plan, and BSBFLM509A Promote continuous improvement.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Participate in planning the introduction of change.	1.1 The manager contributes effectively in the organisation's planning processes to introduce change 1.2 Plans to introduce change are made in consultation with designated individuals/groups 1.3 The organisation's objectives and plans to introduce change are explained clearly to individuals/teams.
2. Develop creative and flexible approaches to solutions.	2.1 Alternative approaches to managing workplace issues and problems are identified and analysed 2.2 Risks are assessed and action is taken to achieve a recognised benefit or advantage to the organisation 2.3 The workplace is managed in a way which promotes the development of innovative approaches and outcomes 2.4 Creative and responsive approaches to resource management improves productivity and services and/or reduces.

Element	Performance criteria
3. Manage emerging challenges and opportunities.	3.1 Individuals/teams respond effectively and efficiently to changes in the organisation's goals, plans and priorities 3.2 Coaching and mentoring assists individuals/teams to develop competencies to handle change efficiently and effectively 3.3 The manager uses opportunities within their responsibility and authority to make adjustments to respond to the changing needs of customers and the organisation 3.4 Individuals/teams are kept informed of progress in the implementation of change 3.5 Recommendations for improving the methods/techniques to manage change are negotiated with designated individuals/groups.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

At AQF level 5, frontline management will normally be engaged in a workplace context where they:

- engage in tactical and operational planning within the organisation's strategic plans for example, prepares an annual tactical plan for a department
- take responsibility for own outputs in relation to broad quantity and quality parameters for example, evaluates own annual performance against personal work plans and the organisation's standards
- take limited responsibility for the achievement of group outcomes for example, reviews group performance against plans and prepares in consultation with the group a performance improvement strategy
- demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas for example, understands in depth the principles and techniques of performance management
- transfer and apply theoretical concepts and/or technical or creative skills to a range of situations for example, researches, negotiates and establishes protocols for customer service for the department
- analyse and plan approaches to technical problems or management requirements for example, given the work team's inability to achieve planned outcomes/outputs,

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analyses the team's performance and develops strategies with the team to rectify the situation
- evaluate information using it to forecast for planning or research purposes for example, the organisation's goals and strategic and tactical plans are analysed in preparation for the preparation of the department's annual operational plan.

Frontline management at this level normally operate in a relatively diverse and complex workplace environment in which they use the organisation's:
- goals, objectives, plans, systems and processes
- quality and continuous improvement processes and standards
- access and equity principles and practice
- business and performance plans
- defined resource parameters
- ethical standards.

They may use legislation, codes and national standards relevant to the workplace including:
- award and enterprise agreements
- commonwealth and state/Territory legislative requirements especially in regard to occupational health and safety
- industry codes of practice.

Manager refers to:
- a person with frontline management roles and responsibilities, regardless of the title of their position.

Designated individuals/groups includes:
- those who have a stake in the change and innovation.

OHS considerations may include:
- provision of information about OHS in context of change and the organisation's OHS policies, procedures and programs
- implement and monitor participative arrangements for management of OHS in context of change
- OHS hazard identification, risk assessment and control
- implement procedures for dealing with hazardous events.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence
- identifies opportunities to improve performance in consultation with appropriate individuals/groups
- develops flexible and creative approaches and strategies to introduce and manage change and innovation
- assesses risks associated with the introduction of change
- provides coaching and mentoring support to facilitate change.

Underpinning knowledge

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts, with substantial depth in some areas:

- the relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- the principles and techniques associated with:
  - managing change and innovation
  - assessing risks
- the management styles which facilitate change
- the organisation's processes and procedures to plan and introduce change
- the sources of change and how they impact on the organisation
- the factors which lead/cause resistance to change.

Underpinning skills

- functional literacy skills to access and use workplace information
- communication skills including researching and analysing information, reporting.
- influencing the organisation's culture so that it is receptive to change and innovation
- monitoring trends in the internal and/or external environment
- responding positively to new situations/challenges
- evaluating alternative proposals for change
- drawing on the diversity of the workplace to assist the organisation benefit from change
- managing resistance to change
- gaining the trust and confidence of colleagues
- dealing with people openly and fairly
- using consultation skills effectively
- using coaching and mentoring skills to provide support to colleagues
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.

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- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to obtain information about the change processes
- communicating ideas and information (level 2) to individuals and team members about the impending changes
- planning and organising activities (level 3) to introduce change
- working with teams and others (level 3) to engage in the change process
- using mathematical ideas and techniques (level 2) to make calculations associated with the existing change
- solving problems (level 2) to address difficulties arising from the change
- using technology (level 2) to manage scheduling of tasks.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	3	3	2	2	2

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Unit title

BSBFLM511A Develop a workplace learning environment

Unit descriptor

This unit is equivalent to the original unit BSXFMI511A Contribute to the development of a workplace learning environment.

Frontline management plays a prominent role in encouraging and supporting the development of a learning organisation. Promoting a learning environment in which work and learning are integrated is an important goal to be achieved. At this level, work will normally be carried out within complex and diverse methods and procedures which require the exercise of considerable discretion and judgement, using a range of problem solving and decision making strategies.

Consider co-assessment with BSBFLM505A Manage operational plan, and BSBMGT505A Ensure a safe workplace.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Create learning opportunities.	1.1 Workplace environments which facilitate learning are developed and supported 1.2 Learning plans are developed as an integral part of individual/team performance plans 1.3 Learning plans reflect the diversity of needs and learning opportunities 1.4 Individual/team access to, and participation in, learning opportunities is facilitated 1.5 Negotiation with training and development specialists results in the planning and provision of learning which enhances individual, team and organisational performance.
2. Facilitate and promote learning.	2.1 Workplace activities are used as opportunities for learning 2.2 Coaching and mentoring contributes effectively to development of workplace knowledge, skills and attitudes 2.3 The benefits of learning are shared with others in the team/organisation 2.4 Workplace achievement is recognised by timely and appropriate recognition, feedback and rewards.

Element	Performance criteria
3. Monitor and improve learning effectiveness.	3.1 Performance of individuals/teams is monitored to determine the type and extent of additional work-based support 3.2 Feedback from individuals/teams is used to identify and introduce improvements in future learning arrangements 3.3 Adjustments negotiated with training and development specialists result in improvements to the efficiency and effectiveness of learning 3.4 Records and reports of competency are documented and maintained within the organisation's systems and procedures.

Range of variables

Context

The range statement provides advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment. The following variables may be present for this particular unit:

Legislation, codes and national standards relevant to the workplace which may include:

- award and enterprise agreements and relevant industrial instruments
- relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- relevant industry codes of practice.

At AQF level 5, frontline management will normally be engaged in a workplace context where they:

- engage in tactical and operational planning within the organisation's strategic plans for example, prepares an annual tactical plan for a department
- take responsibility for own outputs in relation to broad quantity and quality parameters for example, evaluates own annual performance against personal work plans and the organisation's standards
- take limited responsibility for the achievement of group outcomes for example, reviews group performance against plans and prepares in consultation with the group a performance improvement strategy
- demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas for example, understands in depth the principles and techniques of performance management
- transfer and apply theoretical concepts and/or technical or creative skills to a range of situations for example, researches, negotiates and establishes protocols for customer service for the department
- analyse and plan approaches to technical problems or management requirements for example, given the work team's inability to achieve planned outcomes/outputs, analyses the team's performance and develops strategies with the team to rectify the situation

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- evaluate information using it to forecast for planning or research purposes for example, the organisation's goals and strategic and tactical plans are analysed in preparation for the preparation of the department's annual operational plan.

Frontline management at this level normally operate in a relatively diverse and complex workplace environment in which they use the organisation's:

- goals, objectives, plans, systems and processes
- quality and continuous improvement processes and standards
- access and equity principles and practice
- business and performance plans
- defined resource parameters
- ethical standards.

They may use legislation, codes and national standards relevant to the workplace including:

- award and enterprise agreements
- Commonwealth and State/Territory legislative requirements especially in regard to occupational health and safety
- industry codes of practice.

Training and development specialists may be:

- internal or external.

Workplace activities to facilitate learning may include:

- mentoring, action learning, coaching, shadowing, exchange/rotation.

OHS considerations may include:

- implement and monitor the organisation's procedures for providing OHS training
- learning plans include OHS
- training records include OHS.

Evidence guide

The evidence guide identifies the critical aspects, underpinning knowledge and skills to be demonstrated to confirm competence for this unit. This is an integral part of the assessment of competence and should be read in conjunction with the range statement.

Critical aspects of evidence

- facilitates the development of a learning environment
- identifies workplace activities which facilitate learning
- negotiates learning arrangements with training and development specialists
- provides coaching and mentoring support.

Underpinning knowledge

At this level the learner must demonstrate understanding of a broad knowledge base incorporating some theoretical concepts, with substantial depth in some areas.

- the relevant legislation from all levels of government that affects business operation, especially in regard to occupational health and safety and environmental issues, equal opportunity, industrial relations and anti-discrimination
- the principles and techniques associated with:

- adult learning
- establishing a learning environment
- work based learning
- structuring learning.

Underpinning skills

- functional literacy skills to access and use workplace information
- identifying learning needs
- developing learning plans
- selecting and using work activities to create learning opportunities
- establishing a workplace which is conducive to learning
- negotiating learning arrangements with training and development specialists
- encouraging colleagues to share their knowledge and skills
- using coaching and mentoring to support learning
- evaluating the effectiveness of learning
- gaining the trust and confidence of colleagues
- dealing with people openly and fairly
- using consultation skills effectively
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

Resource implications

The learner and trainer should have access to appropriate documentation and resources normally used in the workplace.

Consistency of performance

In order to achieve consistency of performance, evidence should be collected over a set period of time which is sufficient to include dealings with an appropriate range and variety of situations.

Context/s of assessment

- Competency is demonstrated by performance of all stated criteria, including paying particular attention to the critical aspects and the knowledge and skills elaborated in the evidence guide, and within the scope as defined by the range statement.
- Assessment must take account of the endorsed assessment guidelines in the Chemical, Hydrocarbons and Oil Training Package.
- Assessment of performance requirements in this unit should be undertaken in an actual workplace or simulated environment.
- Assessment should reinforce the integration of the key competencies and the common competencies for the particular AQF level. Refer to the key competency levels at the end of this unit.

Key competencies

- collecting, analysing and organising information (level 2) to assemble information about learning options
- communicating ideas and information (level 2) to convey learning opportunities to individuals/teams
- planning and organising activities (level 3) to develop learning plans

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- working with teams and others (level 3) to promote the development of a learning culture
- using mathematical ideas and techniques (level 1) to compile financial data about learning arrangements
- solving problems (level 3) as an aid to resolving difficulties with competency development
- using technology (level 2) assist in the management of information.

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
2	2	3	3	1	3	2

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Unit title

PMAOHS601A Establish workplace OHS management system

Unit descriptor

This competency covers the establishment and maintenance of the OHS management system (OHSMS) at the senior management level, in order to meet legislative requirements and to ensure that the workplace is, so far as is practicable, safe and without risks to the health of employees.

This unit replaces *PMAOHS600A Ensure a safe workplace.*

Prerequisites

This unit **has** the prerequisites of:

- PMAOHS503A Maintain the workplace OHS management system.

Element	Performance criteria
1. Identify needs of the OHSMS	1.1 Analyse the workplace to identify needs and workplace factors that may impact on the design of the OHSMS 1.2 Clarify OHS legal obligations in relation to the specific workplace 1.3 Review relevant standards relating to OHSMS 1.4 Identify links with other functional areas and management systems 1.5 Seek input from stakeholders on the design of the OHSMS
2. Establish the framework for the OHSMS	2.1 Ensure OHS responsibilities and duties are documented and accountability processes are in place 2.2 Identify and source financial and human resources required for the operation of the OHSMS 2.3 Establish or review OHS policies and procedures 2.4 Ensure implications of any proposed changes to the workplace are identified and addressed 2.5 Recognise limits of own professional expertise and consult OHS specialists as necessary
3. Establish and maintain participative arrangements for the management of OHS.	3.1 Establish and maintain appropriate participative processes with employees and their representatives in accordance with relevant OHS legislation and industry standards 3.2 Provide information on OHS to employees in a format that is readily accessible and understandable 3.3 Promptly and effectively deal with and resolve issues raised through participation and consultation in accordance with procedures for issues resolution 3.4 Provide information about the outcomes of participation and consultation in a manner accessible to employees.

Element	Performance criteria
4. Establish and maintain risk management processes	4.1 Establish or review procedures for hazard, incident and injury reporting and investigation 4.2 Establish or review procedures for hazard identification, hazard analysis and risk assessment 4.3 Establish or review hazard specific risk control measures are in place to meet legal requirements and minimise risk as far as is practicable 4.4 Establish or review procedures for on going control of identified and hazards and monitoring of the effectiveness f controls
5. Establish and maintain an OHS training program.	5.1 Conduct an OHS training needs assessment for the workgroup that takes account of legislative requirements, internal policies and procedures, skills of workgroup and risk control requirements 5.2 Develop and implement an OHS training program to identify and fulfil employee's OHS training needs as apart of the enterprise general training program 5.3 Coordinate with relevant training experts as necessary.
6. Establish and maintain a system for OHS records.	6.1 Identify and address legal requirements for record keeping and reporting 6.2 Sources of OHS information are identified and accessed 6.3 Actions are taken to ensure that records are accurately completed, collected and stored
7. Implement OHS systems, strategies and plans	7.1 OHS priorities are determined in consultation with managers and taking account of participative arrangements in the workplace 7.2 Plans are developed for the implementation of OHS strategies 7.3 Plans are monitored for achievement and updated as required

Range of variables

Context

This unit of competency describes OHS requirements applicable for those with managerial responsibilities for establishment and ongoing management of the occupational health and safety management system within the enterprise. This may be as a worker or as an owner of a business.

The competency is to be exhibited within the area of managerial responsibility, which may be an entire enterprise or department of an enterprise. Roles and responsibilities will vary from enterprise to enterprise.

Competence is demonstrated in the context of an enterprise where the OHS system with related policies, procedures and programs may or may not be established. Where the OHS system is established, the role will relate to the review of the OHSMS.

Workplace factors that may impact on the design of the OHSMS include:

- whether certification is required
- organisational structure

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- management commitment
- management style and OHS knowledge and skills of managers
- workplace culture including industrial relations and safety culture
- communication and consultation processes
- other management systems requiring interface or integration with the OHSMS
- resources available
- nature of hazards and level of risk
- staff profile including language, literacy and numeracy, workplace ethnic and cultural diversity, special needs for employees

Other functional areas\and management systems may include:

- strategic planning
- purchasing, procurement and contracting
- logistics
- HR and personnel management including payroll
- engineering and maintenance
- information and records management
- finance and auditing
- environmental management
- quality management

Relevant standards relating to OHS may include:

- Australian standards
- standards developed by OHS authorities
- industry standards
- standards developed by commercial organisations

This competency covers process manufacturing plants which may involve workplace hazards such as:

- chemicals and hazardous materials
- gases and liquids under pressure
- moving machinery
- materials handling
- working at heights, in restricted or confined spaces, or environments subjected to heat, noise, dusts or vapours.

Emergencies may include:

- incidents with a potential for serious injury
- fires and explosions
- chemical spills
- bomb scares.

Legal requirements for record keeping will include requirements under:

- hazardous substances and dangerous goods legislation including requirements to keep registers
- OHS and environmental legislation to report serious incidents and injuries, keep records of risk assessments

Sources of OHS information may be external and include:

- OHS legislation, codes of practice and Australian and International standards
- OHS regulators and National Occupational Health and Safety Commission
- industry bodies

- internet sites, journals and newsletters

Internal sources of OHS information include:

- OHS policies and procedures
- Manufacturers' manuals
- Risk assessments, JSA's, workplace inspections
- MSDSs and registers
- Hazard and incident reports

Evidence guide

Assessment context and methods

The unit 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 timely assessment of parts of this unit of competency. 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, and the outcomes of the process such a policies and procedures developed, plans and reports written, minutes of meetings chaired.

Critical aspects

It is essential that the OHS issues and workgroup dynamics are understood together with the required OHS knowledge in order to frame and implement an OHSMS that is practical and relevant to the workplace. Competence must be demonstrated in the ability to:

- develop appropriate documentation
- consult and negotiate to implement the policies and procedures
- apply a systematic process to planning and implementation

Consistent performance should be demonstrated. In particular look to see that the required level includes a working knowledge of the OHSMS as it applies in the specific workplace. Look to see knowledge and understanding of:

- OHS responsibilities of all levels in the workplace
- the consultation processes, either general or specific to occupational health and safety
- training and assessment of training needs
- hazard identification and risk assessment
- implementation of risk control measures by applying the hierarchy of control
- the need for specific hazard policies and procedures
- new and relevant occupational health and safety information
- occupational health and safety record keeping
- the system/routine for maintenance of plant and equipment
- the system for purchasing of supplies and equipment
- OHS issue resolution processes.

These aspects are best assessed in the actual workplace and work group however they may also be assessed as a review process in a sample workgroup accessed for the purpose of the assessment supported by a range of scenarios/case studies.

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Resource implications

Assessment will require access to a work group over an extended period of time, or a suitable method of gathering evidence over a period of time.

Other assessment advice

It is expected that this competency may be applicable in combination with other industry, occupation or workplace-specific competencies, it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

Essential knowledge

Knowledge and understanding of the workplace OHSMS and State OHS legislation, regulations, codes of practice and relevant industry standards, sufficient to establish and maintain the OHSMS within the scope of their responsibilities and competencies.

In these industries which are characterised by high risk hazards, it is vital that the overarching legal responsibility of managers is recognised in relation to the establishment and implementation of the OHSMS including ensuring the compliance of operators with established policies and procedures. The responsibility applies not only within the general OHS Acts and regulations, but also within the legislation and national and industry standards applying to hazardous substances, dangerous goods and major hazards.

Competence includes the ability to apply a working knowledge of:

- all relevant State and Territory OHS legislation particularly as it relates to the roles and responsibilities of employers and employees including supervisors and contractors, requirements for information and consultation and processes and arrangements to met these obligations, requirements for OHS record keeping and reporting and requirements for training and licensing
- elements of an OHSMS and principles and practices of effective OHS management and risk control, OHSMS requirements of other functional area and management systems including business planning, purchasing, maintenance, contractors, training
- barriers to implementation of OHS including language and literacy, cultural diversity of workforce and workplace culture in relation to OHS
- codes of practice, relevant industry standards, workplace procedures and work instructions
- apply the hierarchy of control to develop risk control procedures

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	3	3	3

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Unit title

PMAOMIR622A Build partnerships to improve incident response capacity

Unit descriptor

This unit covers the building of partnerships to improve the organisation's capabilities to respond to incidents. In a typical scenario the person would establish, as part of the organisation's strategic preparedness, mutual aid provisions within inter company relationships so that assistance may be available as needed in a crisis. The person would typically be a member of the crisis management team and would initiate, formalise and manage joint efforts with other organisations to improve incident response capacity.

Key aspects of the competence include:

- Developing philosophies and strategies which assist to build partnerships
- Laying the foundations for mutual cooperation and assistance
- Establishing structures through which strategic partnerships can be implemented

The person would:

- Identify areas of cooperation in relation to incident response
- Initiate talks/negotiations on cooperative efforts/joint activities
- Manage the relationship in order to enhance incident response capacity
- Manage the documentation of agreed cooperative efforts/joint activities
- Manage the relationships and ensure sustainability

Generally, the person would be a member of senior management and a member of the crisis management team. Although independent action may be required, he/she will be expected to coordinate, liaise and consult with other members of the team and other appropriate personnel.

Prerequisites

This unit **has no** pre-requisites.

Element	Performance criteria
1. Identify opportunities for specific partnerships	1.1. Identify opportunities for joint/cooperative efforts towards incident response 1.2. Undertake consultation within the organisation to identify the types of partnerships and mutual interest to meet organisational needs 1.3. Develop a strategy on the types of partnership organisations and partnership opportunities 1.4. Approach specific targeted organisations, discuss expectations, ability to meet those expectations and areas of mutual interest

Element	Performance criteria
2. Develop a framework for the partnership	2.1 Consult potential partners to develop frameworks that will meet the needs of all partners
	2.2 Establish the characteristics of the partnership with selected partners
	2.3 Confirm partnership characteristics including structure, scale, roles, goals and time frames with the partners
	2.4 Develop systems to enhance mutual benefit and value contributions from the partnership
	2.5 Develop and communicate measures for success to stakeholders
	2.6 Define an agreed exit strategy
3. Manage the relationship in order to enhance incident response	3.1. Undertake regular consultation, communication and mutual information sharing with all partners
	3.2. Identify, monitor and review challenges facing the partnership and action issues
	3.3. Seek, communicate, document and review opportunities for learning from the partnership
	3.4. Undertake joint venture exercises to improve incident response capacity where appropriate
	3.5. Provide mutual assistance in ensuring compliance to changes in legislative or regulative requirements
4. Rebuild partnerships after an incident	4.1. Incident is examined by partners
	4.2. Issues arising from the incident are explored
	4.3. Issues are followed through and addressed
	4.4. Resolutions are developed to prevent re-occurrence
	4.5. Information and resolutions resulting from discussions are disseminated appropriately
5. Evaluate the effectiveness of the partnership	5.1. The flexibility and appropriateness of responses to issues/challenges facing the partnership is evaluated
	5.2. Performance against agreed measures is evaluated and communicated
	5.3. Capability to implement the exit strategy is monitored, reviewed and communicated to stakeholders

Range of variables

Context

Organisations with whom partnerships can be established include:

- parent company
- joint venture partners
- organisations within a given geographical radius
- external agencies

The framework describes the structure, policy and processes of the partnership to best meet stakeholder needs.

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Measures of success refers to the quantifiable and qualitative goals that the partnership has developed to indicate that its purposes are being achieved.

Challenges facing the partnership refers to establishing a cohesive network for effective incident response, rebuilding the partnership in the event of an incident with partners and promoting a positive image of the Company.

Opportunities for learning refers to practices of reflection throughout the workings of the partnership to seek opportunities for improvement in the organisation's incident response, learning from incidents or systems/processes/procedures in own company and partner organisations.

Agreed measurement systems refers to the process of measuring the identified success criteria as established by the partners.

HSE

All operations to which this unit applies are subject to stringent Health, Safety and Environment requirements, which may be imposed through State or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include ‘walk throughs’ of the relevant competency components and may include the use of case studies/scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of ‘what if’ scenarios both in the facility (during demonstration of normal operations and walk throughs of abnormal operations) and off the site.

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident.

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

- strategic communication and conflict resolution skills are demonstrated
- strategic planning is evident including the developing of objectives, strategies and relevant budgets
- partnerships are identified and inclusive proposals developed
- benefits to potential partners and the organisation are identified
- ability to initiate, co-ordinate and conduct discussions with pertinent external organisations in a manner that promotes a positive image of the company is present
- learnings from partnership are brought back into the organisation and analysed for adaptation where appropriate to improve incident response
- effective consultation occurs with team members or appropriate personnel on issues; and follow-up occurs on all issues until resolution is achieved
- actions taken enhance incident response effectiveness

These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

Resource implications

Assessment will require (1) access to an accurately simulated environment or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what ifs and a bank of questions to probe the reasoning behind the observable actions will likewise be required.

Other assessment advice

In all facilities it may be appropriate to assess this unit concurrently with other relevant units.

Essential knowledge

The knowledge referred to in the evidence guide for this unit includes:

- company incident response structures and operations
- one's role within the incident response structure, including its parameters, boundaries and/or limitations
- roles, responsibilities and needs of one's own organisation
- roles, responsibilities and needs of other organisations
- understanding of the mission, values and culture of the organisations targeted for and within the partnership
- clarity of 'chain of command' – who will drive the partnership and how it relates to decision making in the organisations
- company security, confidentiality and communication requirements

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Competence also includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- inability to contact key partners in the event of a crisis
- response times or objectives confused or outside agreed parameters
- gaps or overlaps in response, which reduce effectiveness of the response
- lack of ability to communicate effectively within the organisation

Key competencies

1 Collect, analyse & organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others & in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	1	3	2

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Unit title

PMAOMIR650A Manage a crisis

Unit descriptor

This unit covers the competency to manage through a crisis. It applies to a person who would typically be a manager/senior manager for the organisation.

In a typical scenario, a person would establish and manage the implementation of crisis management and intervention strategies which can be used to reduce the risk to the organisation's personnel, other responders, commercial, reputation and contractual assets during incidents. A crisis is defined as an incident of a magnitude that affects the integrity and effectiveness of the organisation or is liable to cause a significant problem to the business.

Key aspects of the competence include:

- minimising escalation of the crisis
- establishing contingency plans for dealing with the crisis
- sourcing and managing of resources required
- manage communication within and outside the organisation
- optimise the organisational response to minimise impact of the crisis

The individual may:

- ensure that organisational response is appropriate
- use communication skills to deal with stakeholders' concerns

Generally the person would be in control of personnel during an incident. At all times they would be liaising and cooperating with other members of the management, other teams and possibly external organisations.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Define the crisis.	1.1. Assess crisis and probable implications 1.2. Identify and monitor secondary threats to situation 1.3. Assess and evaluate data to determine process/system status 1.4. Receive, collate and assess external information 1.5. Identify probable cause of crisis from available information and resources 1.6. Identify, allocate and confirm roles of personnel in the crisis management process.
2. Establish contingency plans.	2.1. Identify appropriate contingency plans for the organisation 2.2. Identify additional resources required 2.3. Coordinate the development of alternative contingency plans to cater for variations in the crisis.

Element	Performance criteria
3. Establish communications.	3.1. Activate communication systems
	3.2. Establish communication with appropriate stakeholders, including customers and suppliers
	3.3. Activate reporting processes and ensure continuous monitoring and evaluation of incident
	3.4. Establish/activate command and control facilities.
4. Assess the crisis.	4.1. Conduct a risk assessment of all factors impacting upon the response
	4.2. Conduct an initial assessment of resources required
	4.3. Identify constraints which may impede the response
	4.4. Identify and assess initial response options.
5. Implement crisis management plan.	5.1. Identify appropriate crisis management plan(s), including contingency plans if required
	5.2. Manage response in accordance with plan and available personnel/equipment
	5.3. Prioritise responses taking into account needs of stake holders
	5.4. Modify plan and deploy additional resources as required
	5.5. Monitor, evaluate and adjust restoration strategies as required.
6. Document and review crisis and response.	6.1. Ensure recording occurs in a timely manner
	6.2. Record and analyse feedback from stakeholders/ witnesses
	6.3. Identify and record root cause/cause tree of crisis
	6.4. Generate and distribute required reports and findings to appropriate personnel.
7. Manage post crisis operations.	7.1. Account for and demobilise resources
	7.2. Initiate post incident recovery
	7.3. Evaluate and document effectiveness of operations
	7.4. Debrief all relevant people
	7.5. Recommend improvements to the crisis management process

Range of variables

Context

This unit of competency covers the management of a crisis within the organisation that may include:

- fire, explosion
- loss of containment (eg. gas leaks, spills)
- damage to facilities (eg. accidents, crashes, aircraft)
- natural disasters (eg. cyclones, wind, rain, earthquake, flood)
- other (eg riot, civil unrest, terrorism)
- threats to supply (eg. raw materials interruption, energy or services supply).

Communications systems may include:

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- any form of communication (eg. direct, telephone, two-way radio, pager, computer, electronic mail, operating logs, intercoms).

Assessment of the crisis may include:

- any aspect which affects the management of the situation (eg. type of incident, risk to life, property and environment, hazards, capability of assigned personnel, adequacy of allocated equipment, information gathered from existing plans/databases, forecasts, meteorological profiles).

Constraints that may impede the response to the crisis need to be considered and may include:

- legislation, organisation procedures
- resources (eg. time, financial, personnel, organisational)
- prevailing weather, seasonal factors
- restrictions on duration of work or the conditions under which personnel may be employed
- sacred sites, other areas of environmental and cultural significance, wilderness areas, hazardous areas, other restricted areas

HSE

All operations to which this unit applies are subject to stringent Health, Safety and Environment requirements, which may be imposed through State or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Relationship to Major Hazard Facility Legislation

Organisations within the Chemical, Hydrocarbons and Oil Refining industries may find themselves falling under the provisions of various Major Hazard Facilities legislation. In developing this unit consideration has been given to the requirements of Sections 8 and 9 of the National Standard For The Control Of Major Hazard Facilities [NOHSC:1014(2002)] and the National Code Of Practice For The Control Of Major Hazard Facilities [NOHSC:2016(1996)].

This unit will assist individuals to meet some of their obligations under the relevant State or Territory legislation. Responsibility for appropriate contextualisation and application of the unit to ensure compliance however, remains with the individual organisation.

Evidence guide

Assessment context and methods

Assessment for this unit of competency will be by way of simulation or observation under incident conditions. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations which can include a variety of incident circumstances.

Simulations must, as closely as possible, approximate actual incident conditions and should be based on the actual facility. Assessments should include ‘walk throughs’ of the relevant competency components and may include the use of case studies/scenarios and role plays.

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

Critical aspects

Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate responsive action. The emphasis should be on the ability to deal effectively with the incident or to contribute effectively to the recovery from the incident.

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

- the crisis is assessed adequately
- the appropriate crisis management plan is implemented
- contingency planning is practiced
- obtaining and recording of relevant information is adequate
- post crisis recovery is initiated
- the crisis is critically analysed to improve future performance

These assessment activities should include a range of problems, including new, unusual and improbable situations which may have been generated from past workplace incident history, incidents in similar workplaces around the world, hazard analysis activities and/or similar sources.

Resource implications

Assessment will require (1) access to an accurately simulated environment in the absence of an on-site incident environment, or (2) a suitable method of gathering evidence of responding ability over a range of situations. A bank of scenarios/case studies/what ifs will be required as will a bank of questions that will be used to probe the reasoning behind the observable actions.

Other assessment advice

In all facilities it may be appropriate to assess this unit concurrently with relevant units such as:

- PMAOMIR320 Manage incident response information
- PMAOMIR344 Develop Incident control strategies
- PMAOMIR512 Develop incident control plans

Essential knowledge

Competence includes an understanding of the emergency response procedures its integral equipment to the level needed to coordinate the response and recognise and resolve problems. In particular it includes:

- crisis management plans
- crisis management principles
- contingency planning
- hazards (physical, regulatory and business) arising from typical crises

Competence also includes the ability to isolate the causes of problems within the incident response system and to be able to distinguish between causes of problems indicated by:

- inappropriate or lack of contingency planning

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- lack of commitment by the organisation to training and incident response exercises
- deviations from standard operating procedures or incident response plans
- "loss" of personnel in either practices or incidents
- strategic failures in communications

Key competencies

1 Collect, analyse & organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others & in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	1	3	2

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Unit title

PMASUP620A Manage environmental management system

Unit descriptor

This competency covers the scoping, establishment and review of the environmental management system in regard to environmental sustainability as an integral part of business planning.

Prerequisites

This unit **has** the prerequisite of:

- PMASUP520A Review procedures to minimise environmental impact of process.

Element	Performance criteria
1. Establish an environmental management system.	1.1 Select an appropriate Environmental Management System as a model for the enterprise/plant 1.2 Develop environmental management policies that reflect the organisation's commitment to environmental sustainability as an integral part of business planning and as a business opportunity 1.3 Establish strategies to encourage all stakeholders to meet high standards of environmental performance and support sustainable innovation and continuous improvement 1.4 Establish policies and procedures to incorporate and support triple bottom line principles 1.5 Establish policies/procedures which minimise environmental impacts 1.6 Check policies conform to current regulatory requirements 1.16 Address environmental management at the planning, design and evaluation stages to ensure that any changes in the workplace are identified for ongoing impact and opportunity.

Element	Performance criteria
2. Manage innovation and improvement.	2.1 Identify, evaluate and take into consideration changing trends and opportunities relevant to the organisation for ongoing improvement programs 2.2 Promote continuous improvement and sustainable innovation as an essential part of doing business and as a context for assessment and planning of environmental performance 2.3 Establish continuous improvement and innovation policies and procedures that include training and professional development to optimise the environmental performance of the organisation 2.4 Establish a system to analyse and communicate the costs and benefits of innovations and improvements and to measure, monitor and record environmental performance 2.5 Establish performance benchmarks and indicators and set targets to maximise continuous improvement.
3. Review environmental management system.	3.1 Develop processes to ensure that an integrated ongoing review is part of the organisation's policy and procedures 3.2 Promote improvement and sustainable innovation to organisational performance by ongoing evaluation and assessment, and changes to policies.

Range of variables

Context

The 'Triple Bottom Line' (TBL) principle is used as a framework for measuring and reporting corporate performance against economic, social and environmental parameters. It involves the focus of an enterprise being not just on the economic value they add, but also on the *environmenta*l and *social* value they can add.

Sustainable development is defined as 'Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.' From a business perspective, sustainable development involves the integration of this objective with the need for business growth and expansion. Effective and innovative environmental management can contribute to business growth by reducing costs, differentiating goods and services and contributing to improved corporate image and staff relations.

Environmental performance may be defined as the measure of an organisation's impact on the environment and their ability to manage and minimise negative impacts.

Legislation, codes and national standards relevant to the workplace which may include

- Relevant Commonwealth and State Environment Acts
- Applicable State environmental regulations
- Licences and permit conditions
- Codes of practice
- Australian standards
- Environmental treaties and conventions

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- National environmental policies, strategies and initiatives such as the National Greenhouse Strategy, National Strategy for Ecologically Sustainable Development etc.
- National Pollutant Inventory
- State of the Environment Reports
- Industry Association commitments (eg, The Global Mining Initiative)

Environmental management policies must be:

- relevant to the organisation's operations
- appropriate to the scope and scale of the business.

Environmental management policies may include:

- local, national and international innovations, programs and ideas
- business sustainability
- environmental load reduction
- waste minimisation
- tenders for the provision of goods and services that specify environmentally preferred selection criteria
- protection of land and habitat
- ecological considerations
- regeneration of damaged ecosystems
- media releases as a result of incidents
- environmental reporting
- communication strategies to ensure all stakeholders are informed of initiatives and to promote achievements to the wider community.

Knowledge of legislation, codes, national standards, industry codes of practice and workplace policies and procedures must:

- be strictly relevant to the particular workplace and is not intended to include detailed technical aspects of environmental science
- details of legislation must be directly relevant to the workplace
- be consistent with the concept that people at this level will be dealing with environmental concepts as part of an overall management responsibility and not as an environmental specialist.

Environmental improvement plans may be established at management level and may include:

- measuring, monitoring and recording environmental performance and continually setting targets for measurable improvements
- all aspects of environmental performance including energy and other resources use, waste minimisation, recycling, transport use.

Environmental sustainability may be influenced by:

- the organisational culture and operations
- internal or external economic climate
- political climate
- market focus/considerations
- environmental impacts of the business operation.

Stakeholders may include:

- board members, financial backers, owners
- all members of the organisation, including management and staff members
- suppliers
- contractors
- others acting on the organisation's behalf
- customers
- external individuals or bodies who may have an interest in or may be affected by the organisation.

Maximising opportunities may involve:

- improved environmental performance
- increased efficiency
- use of alternative energy sources

and may improve/enhance:

- corporate image
- staff morale
- cost reduction
- product differentiation/branding
- identification of market potential.

To minimise environmental impact may include the minimisation of:

- waste/pollution
- emissions/spills
- use of resources, especially reduction of use of non-renewable resources.

Continuous improvement and innovation policies may include:

- consistent reviewing activities in search of a better way
- improving the organisation in all aspects of its operation

and may look at life cycle impacts of the organisation including:

- activities and products are designed to minimise life cycle impacts and maximise opportunities
- tendering and purchasing processes that include life cycle criteria
- product design and manufacture
- packaging policies
- product use and disposal
- vehicle policies that include use of cleaner fuels or alternative energy sources and regular servicing intervals to reduce pollution and improve efficiency.

Performance benchmarks and targets may include:

- best practice or industry codes for the industry/sector
- levels of performance expected of organisation sectors and/or the organisation as a whole.

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.

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Evidence guide

Assessment context and methods

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

Simulation may be required to allow for timely assessment of parts of this unit of competency. 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

Competence must be demonstrated in the ability to develop and establish environmental management policies, systems and procedures in regard to managing sustainable business practices while encompassing environmental sustainability as an integral part of business planning.

Evidence must be strictly relevant to the particular management role and is not intended to include detailed technical aspects of environmental science.

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

- communication/consultation skills to ensure all relevant groups and individuals are advised of what is occurring and are provided with an opportunity for input
- conflict resolution skills to mediate, negotiate and/or attempt to obtain consensus between parties
- planning and evaluation skills to develop policies and procedures
- process analysis skills to identify potential environmental impacts and opportunities
- problem solving skills to deal effectively with environmental impacts and opportunities as identified
- ability to relate to people from a range of social, cultural and ethnic backgrounds and physical and mental abilities.

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

Resource implications

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.

Other assessment advice

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork units, communication units and units relevant to the process equipment.

In a major hazard facility, it may be appropriate to assess this unit concurrently with:

- PMAOHS600 Ensure a safe workplace.

Essential knowledge

The person must demonstrate understanding of specialised knowledge with depth in some areas. Required knowledge is to be limited to that which is sufficient to perform the particular management function and is intended to promote environmental awareness rather than technical environmental competencies.

Competence requires the ability to:

- apply and explain
- relevant legislation from all levels of government that effects business operation, especially in regard to OHS and environmental issues, EEO, industrial relations and anti-discrimination
- concepts of policy development and business planning
- relevant system analysis and design principles
- performance benchmarking and indicator development relevant to the organisation's activities
- environment sustainability as a 'whole system' approach
- techniques to measure sustainability
- quality systems
- supply chain management
- strategies to maximise opportunities
- environment impact minimisation strategies
- relevant knowledge of environmental issues, especially in regard to water catchments, air, noise, ecosystems, habitat, waste minimisation
- relevant knowledge of ecological systems in regard to business operation.

Key competencies

1 Collect, analyse and organise information	**2** Communicate ideas and information	**3** Plan and organise activities	**4** Work with others and in teams	**5** Use mathematical ideas and techniques	**6** Solve problems	**7** Use technology
3	3	3	3	3	3	3

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Unit title

PSPMNGT604A Manage change

Description

The unit covers the development, coordination and evaluation of a change management strategy in response to either imposed or business unit initiated change.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Confirm the need for change.	1.1 The need for change is determined through consideration of factors impacting upon the business unit and/or the organisation 1.2 Key stakeholders are consulted in establishing the need for change 1.3 The need for change is confirmed through analysing proposed change in relation to business unit strategic objectives.
2. Develop a change management strategy.	2.1 A change management strategy is prepared participatively with key stakeholders 2.2 The individuals, groups and others to be affected by change are identified and the strategy is clearly explained 2.3 The requirements and outcomes for change are clearly communicated 2.4 The likely impact of the proposed change to employees within the business unit is clearly explained 2.5 Employee relations implications of change processes are clearly identified and communicated to the business unit 2.6 Options and specific proposals for change and their consequences are discussed with senior staff 2.7 Future trends and organisational needs are discussed and considered in the process of developing strategies for dealing with change 2.8 Change management activities comply with the framework provided by relevant legislation and organisational policy 2.9 Time schedules and performance standards for change management strategies are devised 2.10 Approval to implement the chosen change management strategy is sought from senior management.

Element	Performance criteria
3. Foster commitment to workplace change.	3.1 A range of strategies is used to foster a positive attitude to change 3.2 Advice is provided to staff on the requirements for effective change management 3.3 Resources required to implement change within the business unit are obtained and used 3.4 Relevant leadership strategies are used to assist others to adapt to change.
4. Implement a change management strategy.	4.1 A system is developed to monitor the impact of change 4.2 Policies, practices and procedures are altered and implemented as required to support the change management strategy 4.3 Priorities are identified and reviewed in light of changing circumstances 4.4 Adjustments to the change management strategy are implemented as a result of monitoring.
5. Evaluate the effectiveness of change.	5.1 A valid and reliable evaluation methodology is developed and implemented The strategy is evaluated in accordance with expected outcomes for change A variety of information, including the perspectives of key stakeholders, is sought and utilised Recommendations on appropriate enhancements to the change strategy are formulated and acted upon to inform subsequent change processes The outcomes of evaluation are communicated to relevant personnel.

Range of variables

The Range of variables provides information about the context in which the unit of competency is carried out. It allows for differences between States and Territories and the Commonwealth, and between organisations and workplaces. It allows for different work requirements, work practices, and knowledge. The range of variables also provides a focus for assessment and relates to the unit as a whole.

Business unit may refer to a

- program
- sub-program
- cost centre
- area
- division
- branch
- production unit or section located within the organisation.

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Legislation and policies may include

- Commonwealth and State/Territory legislation including EEO and anti-discrimination law (for example: Commonwealth Racial Discrimination Act, Commonwealth Human Rights and Equal Opportunity Activity, Commonwealth Sex Discrimination Act, Commonwealth Disability Discrimination Act)
- national and international codes of practice and standards
- the organisation's policies and practices
- government policy
- codes of conduct.

Diverse workforce refers to a workforce comprising employees with differences in

- age
- gender
- physical capability
- race
- ethnicity
- religion
- marital status
- sexual orientation
- socio-economic status
- educational background
- personality styles
- interests
- learning styles
- working styles.

A diversity strategy

- is a written or unwritten expression of what a business unit or organisation intends to do to utilise diversity as a productive resource in order to maximise effectiveness and efficiency.

Methods of promoting diversity plans may include

- written documentation
- manuals
- policy and procedure statements, guides
- information brochures and pamphlets
- oral advice and guidance
- one on one meetings
- small group meetings
- telephone contact and/or electronic mail
- training programs.

Benefits and opportunities of diversity in the workplace may include

- improved client service
- wider sources of recruitment
- greater responsiveness to change
- cultural enrichment
- promotion of creativity
- retention of staff
- community public relations, facilitation of attainment of organisation goals.

Communication strategies may include

- small group information sessions
- use of plain English
- translated information
- use of bilingual staff.

Organisational policies and procedures may include

- recruitment and selection
- training and development
- performance management
- promotion and retention of staff
- employment conditions
- organisational mission and values statements.

Stakeholders may include

- all those individuals and groups both inside and outside the organisation, which have some direct interest in the organisation's behaviour, actions, products and services - they may include employees at all levels of the organisation
- other public sector organisations
- union and association representatives
- boards of management
- government
- ministers.

Evidence guide

Critical aspects of evidence

- integrated demonstration of all elements and their performance criteria, and
- effective change management strategy is developed and implemented within the business unit.

Underpinning knowledge

- change management strategies
- project and resource management strategies
- effects of change
- industrial relations issues as applicable to change processes
- negotiation processes
- key factors in the internal and external operating environment
- understanding of the concept of diversity and its integration within and across all human resource and management functions and areas
- EEO, equity and diversity principles
- understanding of the relationship between effective human resource functions and the attainment of business unit objectives
- understanding of organisational goals, policies and procedures
- knowledge of the organisation's career and human resource development strategies, programs and plans
- familiarity with human resources policies and procedures
- relevant jurisdictional legislation as applicable to management and human resource management functions.

Underpinning skills

- effective consultation with stakeholders

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- budgeting skills
- negotiation and counselling skills
- conflict resolution skills
- influencing skills
- project management and evaluation skills
- use of a variety of words and language structures to explain complex ideas to different audiences
- interpreting and explaining complex, formal documents and assisting others to apply them in the workplace
- written advice and reports requiring reasoning and precision of expression
- discussion using exchange of complex oral information
- cross cultural competency including gender and disability.

Resource implications

- case studies or simulated workplace for off-the-job assessment.

Consistency of performance

- Evidence will need to be gathered over time across a range of workplace scenarios to assess consistency of performance.

Context/s of assessment

This competency may be assessed on or off the job.

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Unit title

PSPMNGT605A Manage diversity

Description

This unit covers utilising diversity as productive resource to maximise business unit and/or organisational effectiveness.

Prerequisites

This unit **has no** prerequisites.

Element	Performance criteria
1. Contribute to the development, implementation and review of a diversity strategy to maximise business unit and/or organisational effectiveness.	1.1 A strategy is developed which identifies diversity issues and provides strategies to enhance organisational effectiveness 1.2 The strategy identifies benefits and opportunities provided by diversity 1.3 The strategy links diversity with the core business of the business unit, the organisation' strategic goals and the demographic profile of the client base 1.4 The strategy is developed in consultation with stakeholders, including people from key equity groups and the organisation's clients 1.5 The strategy provides a mechanism through which diversity issues can be integrated within organisational policies and procedures, for example, recruitment and selection 1.6 The effectiveness and efficiency of the strategy in achieving business objectives is monitored and reviewed according to its specifications and recommendations for enhancements are identified and acted upon 1.7 The strategy complies with legislative requirements, and organisational policies and practices 1.8 The strategy is promoted within the business unit and/or organisation.

Element	Performance criteria
2. Facilitate the development of a workforce that promotes and values diversity.	2.1 Benefits of a diverse workforce are identified, modelled and communicated to those working within the business unit and/or the organisation 2.2 Initiatives and resources to advance the position of equity groups within the organisation or business unit are developed and/or adopted 2.3 Individual competencies, styles and qualities are identified and used to address business needs 2.4 The diversity factors associated with individuals within the business unit are identified and utilised to address business needs 2.5 Diversity training and awareness programs are utilised, as appropriate, to promote and encourage the benefits of a diverse workforce 2.6 A range of working styles that are reflective of a diverse workforce are accepted and encouraged 2.7 Assistance is provided to maximise individual contribution to the attainment of the business unit's objectives 2.8 Strategies are applied to resolve grievance and complaints to maximise the benefits obtained through a diverse workforce.
3. Communicate with a diverse workforce.	3.1 Language, literacy and numeracy issues are identified and addressed to facilitate full participation of all members of the business unit in work and development activities 3.2 A range of communication strategies are employed within the business unit to meet the needs of a diverse workforce base 3.3 The target audience is identified and tailored communications strategies are adopted 3.4 Resources to facilitate effective communication within the workplace are identified and utilised 3.5 Ineffective and inappropriate communication strategies are identified and remodelled to meet the information needs of a diverse workforce.

Range of variables

The range of variables provides information about the context in which the unit of competency is carried out. It allows for differences between States and Territories and the Commonwealth, and between organisations and workplaces. It allows for different work requirements, work practices, and knowledge. The range of variables also provides a focus for assessment and relates to the unit as a whole.

Business unit may refer to a

- program
- sub-program
- cost centre
- area

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- division
- branch
- production unit or section located within the organisation.

Stakeholders may include

- all those individuals and groups both inside and outside the organisation, which have some direct interest in the organisation's behaviour, actions, products and services - they may include employees at all levels of the organisation
- other public sector organisations
- union and association representatives
- boards of management
- government
- ministers.

Clients may include

- individual members of the public
- end users and sponsors
- potential providers or suppliers
- current providers/suppliers
- technical or functional experts or advisers
- Federal, State/Territory and/or Local Government the organisation
- other public sector organisations
- employees
- unions or staff associations
- industry bodies
- local communities and society as a whole
- lobby groups
- special user groups.

Client services may include any service relevant to the agency.

Legislation and policies may include

- Commonwealth and State/Territory legislation including EEO and anti-discrimination law
- national and international codes of practice and standards
- the organisation's policies and practices
- government policy
- codes of conduct.

Evidence guide

This evidence guide must be read in conjunction with the assessment guidelines for the National Public Services Training Package.

Critical aspects of evidence

- integrated demonstration of all elements and their performance criteria
- the establishment and maintenance of a network of clients
- the requirements of specific groups are incorporated in all aspects of client service work and
- positive feedback from clients.

Underpinning knowledge

- legislative and regulatory frameworks influencing the provision of client services
- current developments in effective client services delivery
- understanding that the provision of client service is always constrained by the availability of resources and that it is likely that client needs have to be prioritised and rationed
- understanding of the organisation's strategic goals and their implications for future human resource requirements
- understanding of the relationships between effective management of diversity and satisfying client needs
- understanding of the concept of diversity and its integration within and across all human resource and management functions and areas
- EEO, equity and diversity principles
- understanding of organisational goals and policies
- understanding of evaluation/review strategies and methodologies.

Underpinning skills

- marketing and promotion skills
- literacy skills used in oral and written clarification of issues
- negotiating variations and changes with clients;
- using language and style for written submissions;
- using technical and other vocabulary
- use of a variety of words and language structures to explain complex ideas to different audiences
- interpreting and explaining complex, formal documents and assisting others to apply them in the workplace
- written advice and reports requiring reasoning and precision of expression
- discussion using exchange of complex oral information
- networking skills with clients, suppliers and stakeholders
- evaluation skills
- project management and evaluation skills
- cross cultural competency including gender and disability.

Resource implications

- case studies or simulated workplace for off-the-job assessment.

Consistency of performance

- Evidence will need to be gathered over time across a range of workplace scenarios to assess consistency of performance.

Context/s of assessment

This competency may be assessed on or off the job

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