This kit contains the endorsed components of the Chemical, Hydrocarbons and Oil Refining Training Package PMA98.

The kit comprises:

1. Preamble
2. ‘Process’ competency standards
3. ‘Hydrocarbons’ competency standards
4. ‘Process support’ and ‘business support’ competency standards
5. Assessment guidelines
6. Qualifications framework
7. Attachments:
   7.1 List of State and Territory process manufacturing industry training advisory boards
   7.2 Organisations/people who contributed to the development of the Training Package
   7.3 Steering committee that guided the development of the standards
   7.4 Project methodology
   7.5 Where is it? – Mapping of previous competency units to the revised competency units
   7.6 Mapping of competency units to chemical and oil refining curriculum
   7.7 Key competencies
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1 NOTE that each of the seven sections of this kit has its own table of contents.
Introduction

This Training Package covers the chemical, hydrocarbons and oil refining sectors of the process manufacturing industries. While these sectors operate in a largely independent manner, there is sufficient commonality in operation to warrant the incorporation of these sectors into the one training package.

A steering committee representing all industry sectors and major stakeholders was established. The steering committee also included representatives of the State/Territory ITAB network, the State Training Authorities and the Australian National Training Authority. Committee members are listed in attachment 3 of this Training Package. The steering committee met monthly during the project to monitor progress and direction and to provide advice.

The project was managed by Manufacturing Learning Australia (MLA), the National Process Manufacturing ITAB. MLA was actively involved with the consultations and the development processes.

The project was conducted by a consortium headed by Total Training and Performance Solutions (TaPS) based in Sydney and supported by Abbinga Ryan and Associates (Melbourne) and Training and Assessment Services (Perth).
Methodology

Summary of methodology

The first stage was to consider the views of major users of the existing standards in order to formulate an approach to the first round of consultations. While the initial information available suggested that little needed to be changed with the existing standards, this first stage of the project revealed that a significant recasting of the existing chemical and oil standards was required.

The TaPS consortium, in liaison with MLA, developed a model of the competency standards which met the needs expressed in the first stage. This model was approved by the steering committee.

New and revised competency units were then developed to meet the model and circulated in advance of the second round of focus groups. Competency standards followed the format of the ANTA Best Practice Manual. Several hundred copies were distributed. The approach was wholeheartedly supported by all of the focus groups. Suggestions to improve the draft Training Package were received from a wide range of sources and these were incorporated. Final versions were then also circulated for approval.

Consultations within each State and at the focus groups were arranged by the State ITABs.

The methodology is expanded in attachment 4 which also deals with industry issues.

Consultation/validation

Consultation occurred with all States and Territories generally through the relevant State/Territory ITAB. A list of organisations and people who contacted this project is given in attachment 2 of this Training Package. Circulation of documents for review was significantly wider than this list.

Validation was progressive throughout the project with each significant step validated firstly against the steering committee and secondly against the industry. The State ITABs were instrumental in distributing documents for validation.

A mapping of ‘new’ to ‘old’ units and chemical and oil units to curriculum was also undertaken as a further cross check. This provided further validation of the standards, although it did reveal some gaps in the curriculum (see attachment 6).

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2 Information was available from the Scoping Report for the Development of Training Packages for the Petroleum, Coal and Chemical Product Manufacturing Industry (Dutneall & Mylechreest 1997) and the newly revised curriculum for operators were main sources.
Competency standards

What are competency standards?

The standards are part of the national Training Package for the chemical, hydrocarbons and oil refining industries.

The standards set out the competencies that are required of operators employed in the chemical, hydrocarbons and oil refining industries. They are a set of descriptions of the level of skill and the depth of knowledge employees require to work competently at various skill levels in the industry.

The standards form the basis for the recognition of skills, the national Training Package, accreditation of courses and the ability to transfer qualifications across Australia. The standards describe what is needed to gain formal qualifications and statements of attainment in the industry. The curricula that is being used by colleges of TAFE and other registered training organisations are linked to these competency standards (see qualifications framework).

A major purpose of the standards is to assist industry to define the skills and knowledge that apply to different types and levels of work. The standards are broad statements that can be applied to any company in the industry anywhere in Australia.

They can be customised to make them more specific for individual companies (see Qualifications Framework). They can be used as a basis for redesigning jobs, conducting skill audits and training needs analysis, developing skill based classification structures and benchmark job descriptions, recognising current competencies of employees and in developing appropriate training.

Many people contributed to the development of the standards including enterprises across Australia. A list of these appears in attachment 2 of the Training Package.
Nature of the competency standards

These standards are used as the basis for the qualifications that are described in the qualifications framework section of this kit.

Information about how to assess against the competency standards is contained in the assessment guidelines section of this kit.

The standards are made up of the following parts:

Units of competency
These are titles that describe large ‘chunks of work’, such as
Operate fluid flow equipment.

Elements of competency
These break the units down and describe what is needed to achieve the unit. For example, in the basic unit ‘Operate fluid flow equipment’, one element is
Operate pump drivers.

Performance criteria
These describe the indications that the operator can perform the element of competence to a satisfactory level. For example, for the element ‘Operate pump drivers’, there are several performance criteria. One of these is
Recognise trends/patterns which indicate a potential or actual problem with the pump driver.

Range of variables
This describes the range of situations in which this competency is required.

Evidence guide
This part of the standards describes some assessment that could be applied to judge if a person has achieved the competency.
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plus

Range of variables

describes the range of situations in which this competency is required

Evidence guide

describes some assessment that could be applied to judge if a person has achieved the competency
The Training Package and new employees

The list of competencies and the requirements of the qualifications framework can be somewhat daunting until you become familiar with them. This section suggests ways of using the competencies and qualifications framework to help form a training plan for a new employee.

The training plan suggested would develop competencies suitable to introduce the new employee to the job and the industry and result in the awarding of a Certificate I in Process Plant Skills. Time to achieve this outcome will depend very much on the particular organisation, plant and training opportunities.

The new employee may have little or no experience of the industry. For this reason the first emphasis must be on developing competence in occupational health and safety. It is expected that this competence would be developed in conjunction with the competencies in communication and in the environment.

Thus the orientation stage of the training plan would be aimed at delivering:

- **PMAOH&S 100A** Follow OH&S policies and procedures
- **PMACOM100a** Relay and respond to information
- **PMAENV100a** Identify and minimise environmental hazards.

At least some elements of these three competencies would often form part of your company induction procedures.

Following orientation, the next stage would be to develop competencies in plant operation and working on the plant, making measurements/taking readings and housekeeping. These competencies form the basis of plant training. Other competencies may be introduced at this stage, depending on the organisation’s requirements and the individual’s training needs.

It is suggested that this stage include the development of the competencies:

- **PMAPRO100a** Apply procedures to equipment operation
- **PMAPROC101A** Make measurements
- **PMAPROC102A** Undertake housekeeping operations.

Further training would broaden the focus to include aspects of planning and contribution to quality:

- **PMAPLAN100a** Follow established work plan
- **PMAQUAL100a** Contribute to quality procedures.

Typically this later group of competencies would be developed over a period while working on the plant. This training plan would allow the new employee to gain the Certificate I qualification in a staged and orderly program.
Table of Competencies

Table of core competencies
Core competencies are those required by all process personnel at that level across all sectors of the chemical, hydrocarbons and oil refining industry. These competencies therefore cannot be equipment or process specific, but rather reflect the underlying health, safety, environment, quality and interpersonal skills required.

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Manufacturing Learning Australia

‘Process’
Competency Standards

for the

Chemical, Hydrocarbons And Oil Refining Industries

Training Package code: PMA98
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UNIT TITLE:

Apply Procedures To Equipment Operation (PMA PROC 100 A)

UNIT DESCRIPTOR:
This competency covers the operation of any packaged equipment and any other item of equipment which is operated with limited application of knowledge.

ELEMENT | PERFORMANCE CRITERIA
---|---
1. Follow workplace procedures | Demonstrates the ability to:
1.1 Access and follow appropriate procedures
1.2 Complete all reporting (written, verbal and electronic)
1.3 Recognise and report non-conformances to procedure

2. Monitor and operate the equipment/process | 2.1 Turn the equipment on and off as required
2.2 Monitor operation of equipment/process as per standard procedure
2.3 Recognise deviations from standard/desired conditions
2.4 Take corrective action specified in standard procedures

RANGE OF VARIABLES:
Context:
This competency is performed by operators operating packaged and similar plant at any level. This competency applies to the operation of any plant item where the level of applied understanding and knowledge required is limited regardless of the level of engineering sophistication of the plant.

This competency unit includes items of equipment such as:
- packaged plant
  - compressors
  - refrigeration plant, etc
- routine equipment
  - fans
  - blowers, etc.

Typical problems restricted to responding in a routine, predetermined manner as specified in the standard procedures
All operations are performed in accordance with standard operating procedures

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
### Knowledge and Enterprise Requirements:
Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the equipment item. Thorough knowledge of enterprise standard operating procedures is required.

### Assessment Focus:
Assessment should establish the ability to follow procedures, recognise situations requiring action, and then efficiently implement the action specified in the standard procedures.

### Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

### EVIDENCE GUIDE:
#### Critical Aspects:
Consistent performance at the required standard should be demonstrated. In particular look to see that:
- standard procedures are followed
- deviations from desired conditions are recognised
- action specified in the standard procedures is carried out.

### Concurrent Assessment and Prerequisites:
This unit has no prerequisite competencies.
It should be assessed in conjunction with:
- PMAPROC101A Make measurements and
- PMAPROC102A Undertake housekeeping operations.

Individual enterprises may choose to add prerequisites and co-requisites relevant to their process.

#### Essential Knowledge:
Competence to include the ability to apply the standard procedures.

### Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.
Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.
In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
# Make Measurements (PMA PROC 101 A)

## UNIT TITLE:

**Make Measurements (PMA PROC 101 A)**

## UNIT DESCRIPTOR:

This competency covers the making or taking of measurements in a variety of sites and locations.

## ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify appropriate</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>measurements</td>
<td>1.1 Select appropriate units on the measuring device</td>
</tr>
<tr>
<td></td>
<td>1.2 Select appropriate scale(s) on the measuring device</td>
</tr>
<tr>
<td>2. Perform measurements</td>
<td>2.1 Explain the range of results that may be obtained</td>
</tr>
<tr>
<td></td>
<td>2.2 Identify and take account of relevant external factors</td>
</tr>
<tr>
<td></td>
<td>2.3 Perform measurements using appropriate techniques</td>
</tr>
<tr>
<td></td>
<td>2.4 Compare the measurements against the range of expected results</td>
</tr>
<tr>
<td></td>
<td>2.5 Explain the need for calibration and use calibrated equipment to make measurements</td>
</tr>
<tr>
<td>3. Record result</td>
<td>3.1 Accurately record the result in the appropriate format</td>
</tr>
<tr>
<td></td>
<td>3.2 Record the result to the appropriate level of detail</td>
</tr>
</tbody>
</table>

## RANGE OF VARIABLES:

### Context:

This competency is typically performed by plant operators who may be working individually or in a team environment. It typically is related to:

- making measurements using physical and chemical measuring equipment
- routine calibration of instruments
- recording results using either a manual or computer system.

All operations are performed in accordance with standard operating procedures.

### Knowledge and Enterprise Requirements:

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

### Assessment Focus:

Assessment should establish the ability to make accurate measurements under a variety of workplace conditions and circumstances.

### Updating Information:

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:
It is essential that the range of appropriate readings is known and the importance of a deviation from this normal range is understood. The importance of using instruments which are within calibration should be able to be explained (but not the process of calibration or the ability to calibrate). Where instruments have different scales, the difference between the scales should be appreciated.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Concurrent Assessment and Prerequisites:
Nil

Individual enterprises may choose to add other prerequisites relevant to their process.

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.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify housekeeping requirements</td>
<td>1.1 Explain and understand site safety and housekeeping standards</td>
</tr>
<tr>
<td></td>
<td>1.2 Undertake housekeeping inspection in accordance with standard operating procedures</td>
</tr>
<tr>
<td></td>
<td>1.3 Identify and schedule housekeeping requirements as appropriate</td>
</tr>
<tr>
<td>2. Perform housekeeping procedures</td>
<td>2.1 Select and check housekeeping equipment and materials in accordance with standard operating procedures</td>
</tr>
<tr>
<td></td>
<td>2.2 Perform housekeeping operations in accordance with standard operating procedures</td>
</tr>
<tr>
<td></td>
<td>2.3 Maintain work area in a clean and safe condition</td>
</tr>
<tr>
<td>3. Dispose of waste materials</td>
<td>3.1 Correctly identify waste materials</td>
</tr>
<tr>
<td></td>
<td>3.2 Dispose of materials to correct locations in accordance with standard operating procedures</td>
</tr>
<tr>
<td>4. Report/record housekeeping operations</td>
<td>4.1 Complete all relevant documentation to standard</td>
</tr>
<tr>
<td></td>
<td>4.2 Report housekeeping requirements to appropriate personnel</td>
</tr>
<tr>
<td></td>
<td>4.3 Identify and report/record improvements to housekeeping standards as appropriate</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:
Context:
This competency unit is typically performed by all operator personnel and includes the following functions:
- planned operations including routine checks and inspections
- unplanned operations, such as minor spills and containment
- disposal of waste materials.

Equipment and supplies may include:
- cleaning equipment and materials
- brooms
- shovels
- solvents
- waste containers
- safety equipment.

All operations are performed in accordance with standard operating procedures.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of plant OH&S requirements and rules. Duty of care obligations of particular workplaces.

Assessment Focus:
Assessment should establish the ability to recognise circumstances which are potentially hazardous or are of such circumstance that they reduce the overall safety and performance of the plant.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Concurrent Assessment and Prerequisites:
Nil

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following:
- safe handling procedures
- duty of care
- products and materials used in the housekeeping process.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
# UNIT TITLE:

*Select And Assemble Materials (PMA PROC 103 A)*

## UNIT DESCRIPTOR:

This competency covers the selection and assembly of all production materials used in a plant.

## ELEMENT PERFORMANCE CRITERIA

**ELEMENT** | **PERFORMANCE CRITERIA**
--- | ---
1. Identify and locate materials | Demonstrates the ability to:
   1.1 Correctly identify material requirements from documentation
   1.2 Identify type, quantity and quality of materials
   1.3 Locate and check materials in accordance with standard operating procedures
   1.4 Confirm availability of required quantity of materials
   1.5 Record and report material shortages
2. Measure quantity of materials | 2.1 Identify types of measuring equipment and their purpose and select according to requirement
   2.2 Use site standard operating procedures to measure and assemble required quantities of materials
   2.3 Check material quantities against documentation
   2.4 Document and label materials
   2.5 Deliver materials to correct location
RANGE STATEMENT:

Context:
This competency is typically performed by operators, weighers, mixers or stores personnel.

This competency unit includes:

1. Indicative functions such as:
   - preproduction preparation of materials, including assembling and labelling
   - preproduction testing of materials, usually involving visual inspections for identification of deterioration or damage
   - preproduction measuring of materials, by weight, volume or density

2. resources such as:
   - measuring equipment including scales, flow meters and graduated vessels
   - safety data sheets
   - enterprise procedures
   - personal protective equipment
   - OH&S and legislative requirements relating to safe manual handling/lifting,
   - labelling requirements (dangerous goods codes, classification numbers, packaging group numbers)
   - HAZCHEM symbols and codes
   - hazardous substances regulations
   - spill containment and disposal procedures

3. materials such as:
   - raw materials
   - packaging materials
   - consumables.

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

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them.

Thorough knowledge of enterprise standard operating procedures is required.
Assessment Focus:
Assessment should establish the ability to follow procedures, recognise situations requiring action, and then efficiently implement the action specified in the standard procedures.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
Consistent performance at the required standard should be demonstrated. In particular look to see that:
- standard procedures are followed
- deviations from desired conditions are recognised
- action specified in the standard procedures is carried out
- the impact of work practices/actions on the environment is understood.

Concurrent Assessment and Prerequisites:
This unit has no prerequisite competencies.

Individual enterprises may choose to add prerequisites and co-requisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply the standard procedures. It includes an awareness of:
- basic measurement procedures
- OH&S and legislative requirements relating to safe manual handling/lifting,
- labelling requirements.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

It is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

*Prepare Materials For Production (PMA PROC 104 A)*

## UNIT DESCRIPTOR:

This competency covers the following of standard procedures related to the preparation of materials prior to production.

### ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Inspect assembled materials               | 1.1 Check materials against documentation  
                                          | 1.2 Record and report variations                                                    |
| 2. Prepare materials                         | 2.1 Check that hoppers, bins and holding tanks are free from contamination             |
                                          | 2.2 Identify classes of compatible and incompatible chemicals                          |
                                          | 2.3 Prepare materials in accordance with standard procedures                           |
                                          | 2.4 Sample and test materials in accordance with standard procedures                  |
                                          | 2.5 Adjust materials to meet specifications                                             |
| 3. Store assembled materials                 | 3.1 Identify the storage conditions required for the main classes of chemicals          |
                                          | 3.2 Identify materials that have special storage requirements                           |
                                          | 3.3 Store and supply materials                                                        |
RANGE OF VARIABLES:

Context:
This competency unit includes:

1. indicative functions such as:
   - preproduction preparation of materials includes:
     - grinding
     - milling
     - dispersing
     - crushing
     - mixing/assembling
   - preproduction testing of materials includes:
     - visual inspections
     - simple testing
   - equipment checks
   - supply of prepared material to operational areas.

2. resources such as:
   - measuring equipment including scales, flow meters and graduated vessels
   - safety data sheets
   - enterprise procedures
   - personal protective equipment
   - HAZCHEM symbols and codes
   - hazardous substances regulations
   - spill containment and disposal procedures

3. materials such as:
   - raw materials
   - packaging materials
   - consumables.

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

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them.

Thorough knowledge of enterprise standard operating procedures is required.
**Assessment Focus:**
Assessment should establish the ability to follow procedures, recognise situations requiring action, and then efficiently implement the action specified in the standard procedures.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**EVIDENCE GUIDE:**
This competency is typically performed by operators or mixers.

**Critical Aspects:**
Consistent performance at the required standard should be demonstrated. In particular look to see that:
- standard procedures are followed
- deviations from desired conditions are recognised
- action specified in the standard procedures is carried out.

**Concurrent Assessment and Prerequisites:**
This unit has no prerequisite competencies.

Individual enterprises may choose to add prerequisites and co-requisites relevant to their process.
**Essential Knowledge:**

Competence to include the ability to apply the standard procedures. It includes an awareness of:

- basic measurement procedures
- OH&S and legislative requirements relating to safe manual handling/lifting,
- labelling requirements (dangerous goods codes, classification numbers, packaging group numbers)
- HAZCHEM symbols and codes
- hazardous substances regulations
- spill containment and disposal procedures
- properties of solids in terms of form include:
  - powder, flakes
  - particle size
  - solubility
  - density and specific gravity
  - melting point
  - heat capacity
- properties of liquids in terms of structure including:
  - solubility
  - wetting
  - density and specific gravity
  - flash point
  - viscosity
  - boiling and freezing point
  - vapour pressure
  - heat capacity
- properties of gases in terms of:
  - condensation point
  - density
  - heat capacity.

**Assessment Method, Context and Resource Implications:**

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

It is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
Overlay competency:

**Shift Materials Safely (TDT D1A)**

**Original Unit Details**

**Source:**
Transport and Distribution Industry Standards (TDT)

**Number:**
Unit D1

**Title:**
Shift materials safely

**Unit Descriptor:**
This unit applies to employees who are required to shift loads by hand.

**Range of Variables:**
Within the process manufacturing industry (chemical, hydrocarbons and oil refining sectors), this unit applies to a variety of warehouse and stores jobs. These jobs may be part of a job role working in a warehouse, store or in activities associated with a job role as a process operator.

**Evidence Guide**

**Critical Aspects:**
These are identical to the original unit.

**Concurrent Assessment and Prerequisites:**
Nil; however this unit may be assessed in conjunction with other units that form part of a job role or function.

**Underpinning Knowledge And Skills:**
These are identical to the original unit.

**Assessment Method, Context and Resource Implications:**
These are identical to the original unit.

**Key Competencies:**
These are identical to the original unit.
## UNIT TITLE:
Operate An Item Of Equipment  
(PMA PROC 200 A)

### UNIT DESCRIPTOR:
This competency covers the application of knowledge and understanding to the operation of an item of equipment.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Start up item of equipment | Demonstrates the ability to:  
1.1 Perform pre-start-up checks  
1.2 Start up the item of equipment  
1.3 Start up normally and after maintenance  
1.4 Build rate steadily  
1.5 Bring to specified conditions within minimum time |
| 2. Monitor and control the equipment item and process |  
2.1 Complete routine checks, logs and paper work,  
2.2 Recognise and take action to minimise the impact on safety, health, the environment and the business of potential and actual problems  
2.3 Monitor feeds and products and take action to maintain required rates and quality  
2.4 Adjust plant to achieve required output rate and quality while maximising plant efficiency |
| 3. Change production rates and/or product grade/specification |  
3.1 Predict from rates and schedule when a change will be required  
3.2 Manage changes smoothly and in a timely manner  
3.3 Minimise disruptions as a result of a change |
| 4. Carry out maintenance procedures |  
4.1 Use measured/indicated data and smell, sight, sound and feel as appropriate to critically and frequently monitor all plant  
4.2 Isolate equipment item and prepare for maintenance/vessel entry as required  
4.3 Test trips and alarms  
4.4 Complete minor maintenance according to standard procedures  
4.5 Receive plant back from maintenance  
4.6 Prepare plant for the introduction of chemicals and operation |
| 5. Shut down equipment item |  
5.1 Determine type of shutdown required  
5.2 Give advanced warning of shut down where possible  
5.3 Change over items of equipment as appropriate  
5.4 Shut down item of equipment  
5.5 Shut down in an emergency when required  
5.6 Reset trips and alarms after a shut down  
5.7 Leave plant in a condition ready to restart  
5.8 Shut down for maintenance when required |
RANGE OF VARIABLES:

Context:
This competency is typically performed by most operators in the plant and typically may be an introductory competency to learning the plant.

This competency unit includes items of equipment where the operator is expected to demonstrate an understanding of the process and the equipment operation. Typically there will be NO prerequisite competencies (see PMAPROC300A Operate a unit of equipment for this). The other 200 stream process competencies should be used as an indicative guide. This competency is for enterprise specific equipment items which are not otherwise described.

It does NOT include the operation of any packaged unit (regardless of its engineering complexity) which are covered by PMAPROC100A: Apply procedures to equipment operation.

Typical problems include:
- recognising and acting on potential and actual problems
- control of critical variables and outputs
- variations in feed rates and quality etc.

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the equipment item.

Thorough knowledge of enterprise standard operating procedures is required. Some awareness of the plant’s business goals is required as a basis for decisionmaking and action.
Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- early warning signs of equipment in need of attention/with potential problems are recognised
- possible causes of a plant trip are recognised and action taken to avoid a trip
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

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

Concurrent Assessment and Prerequisites:
This unit has no prerequisite competencies.

Individual enterprises may choose to add prerequisites and co-requisites relevant to their process.
Essential Knowledge:

Competence to include the ability to apply and explain

- principles of operation
- physics of operation
- and also the ability to distinguish between:
  - material
  - instrument
  - equipment (electrical/mechanical)
  - maintenance

causes of problem, as is relevant to the practical operation of equipment at that job level.

Assessment Method, Context and Resource Implications:

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**
Operate Fluid Flow Equipment  
(PMA PROC 201 A)

**UNIT DESCRIPTOR:**
This competency covers the operation of the range of pumps and valves such as is typically encountered on a plant. It includes the recognition, operation and troubleshooting of these routine plant items.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Operate pumps</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Recognise the type of pump</td>
<td></td>
</tr>
<tr>
<td>1.2 Start up and shut down pump in a manner appropriate to the pump type and duty</td>
<td></td>
</tr>
<tr>
<td>1.3 Adjust flow and head/pressure in a manner appropriate to the pump type</td>
<td></td>
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<tr>
<td>1.4 Start up from standby and after maintenance</td>
<td></td>
</tr>
<tr>
<td>1.5 Complete routine checks logs and paper work, taking action on unexpected readings and trends</td>
<td></td>
</tr>
<tr>
<td>1.6 Change over pumps as required</td>
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</tr>
<tr>
<td>2. Operate pump drivers</td>
<td>2.1 Monitor critical variables such as amps, temperature, vibration, etc</td>
</tr>
<tr>
<td>2.2 Keep critical variables in range</td>
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</tr>
<tr>
<td>2.3 Recognise trends/patterns which indicate a potential or actual problem with the pump driver</td>
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</tr>
<tr>
<td>2.4 Take action to ensure driver is returned to full performance in a timely manner</td>
<td></td>
</tr>
<tr>
<td>3. Operate valves</td>
<td>3.1 Recognise the type of valve</td>
</tr>
<tr>
<td>3.2 Operate valve in a manner appropriate to the valve type</td>
<td></td>
</tr>
<tr>
<td>3.3 Complete routine checks logs and paper work, taking action on unexpected readings and trends</td>
<td></td>
</tr>
<tr>
<td>4. Solve fluid flow problems</td>
<td>4.1 Frequently and critically monitor all plant throughout shift</td>
</tr>
<tr>
<td>4.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant</td>
<td></td>
</tr>
<tr>
<td>4.3 Recognise operational problems</td>
<td></td>
</tr>
<tr>
<td>4.4 Analyse cause of operational problem</td>
<td></td>
</tr>
<tr>
<td>4.5 Take action to solve operational problems</td>
<td></td>
</tr>
<tr>
<td>5. Carry out maintenance procedures</td>
<td>5.1 Isolate fluid flow equipment and prepare for maintenance as required</td>
</tr>
<tr>
<td>5.2 Complete minor maintenance according to standard procedures</td>
<td></td>
</tr>
<tr>
<td>5.3 Receive plant back from maintenance</td>
<td></td>
</tr>
<tr>
<td>5.4 Prepare plant for the introduction of chemicals and operation</td>
<td></td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
This competency is typically performed by all operators. The fluid flow system is the basis of many plants. It is a frequent starting point for operators to learn the operation of the plant as a whole.

This competency unit includes items of equipment such as:

a. pumps
   - centrifugal (rotodynamic)
   - positive displacement
     - reciprocating (piston, diaphragm)
     - rotary (gear, lobe, vane)
   - acid eggs

b. valves
   - globe
   - non-return
   - needle
   - diaphragm (weir, straight through)
   - gate
   - automatic control valves
   - butterfly
   - pneumatic globe
   - plug cock
   - pneumatic butterfly
   - wedge plug
   - fail safe modes
   - ball cock
   - PSV pressure relief

c. piping systems and components
   - bends and elbows
   - Ts
   - expansion mechanisms
   - pipe joints
   - size changes (reducers, nipples, orifices, etc)


d. shaft seals
   - stuffing boxes
   - mechanical seals
   - seal fluids
   - labyrinth seals

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 in accordance with standard operating procedures.
**EVIDENCE GUIDE:**

**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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

Competence must be demonstrated in at least centrifugal pumps and two other types of pumps and five types of valves as indicated in the range statement.

**Concurrent Assessment and Prerequisites:**
There are no prerequisites.

This unit should be assessed in conjunction with:

- PMAPROC101A Make measurements
- PMAPROC102A Undertake housekeeping operations
- PMACOM100A Relay and respond to information.

**Essential Knowledge:**
Competence to include the ability to apply and explain

- principles of operation
- physics of operation
- recognition and description of internals
- correct methods of starting, stopping, operating and controlling flow.
- causes of head loss in piping systems (including comparison of fittings using $L_e/d$ 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 impellers, seals or bearings)

and also the ability to distinguish between types and causes of fluid flow problems as is relevant to the practical operation of equipment at that job level.
**Assessment Method, Context and Resource Implications:**

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

**Operate Fluid Mixing Equipment** *(PMA PROC 202 A)*

UNIT DESCRIPTOR:
This unit is about the operation of the different types of fluid mixers found in chemical and oil plants. It aims at ensuring that people working with fluid mixers know the characteristics of their operation, and can identify sub-optimal performance and take appropriate corrective action.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| **1. Operate fluid mixing equipment** | Demonstrates the ability to:  
1.1 Recognise the type of fluid mixer  
1.2 Identify appropriate applications for the mixer type  
1.3 Start up/shut down fluid mixing equipment  
1.4 Complete routine checks logs and paper work, taking action on unexpected readings and trends |
| **2. Solve fluid mixing problems** |  
2.1 Frequently and critically monitor all plant throughout shift  
2.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant  
2.3 Recognise operational problems and inefficient mixing  
2.4 Analyse cause of operational problem  
2.5 Take action to solve operational problems |
| **3. Carry out maintenance procedures** |  
3.1 Isolate fluid mixing equipment and prepare for maintenance as required  
3.2 Complete minor maintenance according to standard procedures  
3.3 Receive plant back from maintenance  
3.4 Prepare plant for the introduction of chemicals and operation |
<table>
<thead>
<tr>
<th><strong>RANGE OF VARIABLES:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Context:</strong></td>
</tr>
<tr>
<td>This competency is typically performed by all operators who use fluid mixing equipment.</td>
</tr>
</tbody>
</table>

**Equipment will include:**

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

**Fluid mixing principles include:**

- shear
- viscosity
- concepts of uniformity.

**Characteristics of efficient mixing include:**

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

**Remedial action would include changes to:**

- baffles position and angle where appropriate
- impellor
  - size
  - shape
  - speed
  as appropriate.

All operations are performed in accordance with standard operating procedures.

**OH&S:**

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the mixing equipment.

Thorough knowledge of enterprise standard operating procedures is required. Some awareness of the plant’s business goals is required as a basis for decision making and action.

**Assessment Focus:**

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:

Competition must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred

Essential Knowledge:

Competence to include the ability to apply and explain:

- principles of operation
- physics of operation

and also the ability to distinguish between types and causes of fluid mixing problems as is relevant to the practical operation of equipment at that job level.

Concurrent Assessment and Prerequisites:

There are no prerequisites.
## UNIT TITLE:

**Handle Goods (PMA PROC 203 A)**

## UNIT DESCRIPTOR:
This competency applies to the movement of goods into and out of a plant store. It applies to a limited range of goods such as might typically be handled by a plant store. It is NOT intended to be an alternative warehousing competency.

## ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Move goods into store | Demonstrates the ability to:  
1.1 Check paperwork and identity of goods  
1.2 Check for completeness and damage  
1.3 Take action on non-conforming goods/loads  
1.4 Unload goods  
1.5 Move goods to correct storage location  
1.6 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 according to standard procedure |
| 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 |
RANGE OF VARIABLES:

Context:
This competency is typically performed by operators in the plant and is part of their role along with the operation of process units.

This competency covers the handling of a limited range of materials and their moving into and out of a plant/chemical store. The goods will typically be packed, although this does not exclude tanker trucks and semi bulk containers. It is NOT intended for people who as a major function operate a warehouse. The appropriate Transport and Distribution competencies should be used here. It is NOT intended for people who handle bulk goods in tank farms where PMAPROC307A ‘Undertake tank farming operations’ should be used.

This competency may require the operation of forklift trucks or other regulated load shifting devices which are NOT included in this competency and so would be a required co-requisite competency.

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

This competency does not imply that moving goods into store and from store are conducted equally, or even using similar techniques. Customers may be internal or external and the loading/unloading of 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 for storage
• special storage requirements including temperature control
• handling of incomplete loads (either in or out)
• handling of damaged goods, goods with poor/missing labels
• incomplete or incorrect paperwork.

All operations are performed in accordance with standard procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the store processes sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the materials handled. Knowledge of the relevant aspects of the Transport of Dangerous Goods Code (and similar codes) may be required.

Thorough knowledge of enterprise standard operating procedures is required. Some awareness of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency has been developed to cover the handling of goods and services in a plant store where this is undertaken as a relatively minor part of the overall process operations. It should be reviewed after the Transport and Distribution ITAB have developed an additional set of competency standards which are intended to cover this situation.

EVIDENCE GUIDE:
Critical Aspects:
It is essential that the store processes be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a mishap.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
• potential problems are recognised
• action is taken to ensure problems are dealt with in a timely manner
• problems caused in other plant areas by store/material issues are recognised and an appropriate contribution made to a solution
• items initiated are followed through until final resolution has occurred.

Competence must be demonstrated in the operation of all ancillary equipment to the level required for this competency unit.
Concurrent Assessment and Prerequisites:
This unit has no prerequisite competencies.

In many instances, PMAPROC105A ‘Shift materials safely’ (manual handling) and/or PMAPROC214A ‘Operate a forklift’ will be a co-requisite competency. Individual enterprises may choose to add prerequisites and co-requisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply and explain
- storage/handling principles and procedures
- material hazard properties and their implications for safe handling and storage
- significance of material to internal customers
- safe/best transport routes for materials within the site.
- transport restrictions on the materials outside the site
as is relevant to the materials being handled and the nature of the site.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant store. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

**Use Utilities And Services (PMA PROC 204 A)**

### Unit Descriptor:
This unit refers to the use of utilities and services found in chemical and oil plants. It aims at ensuring that operators recognise plant services, use them correctly and can identify basic operational problems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Select utilities and services | 1.1 Identify utilities and services available in the plant  
1.2 Identify key features of each utility and service  
Select appropriate utility/service for the required duty |
| 2. Use utilities and services  | 2.1 Identify components of plant utilities and services  
2.2 Recognise the benefits and limitations of each plant utility and service  
2.3 Identify the hazards associated with each plant utility and service  
2.4 Select appropriate utility and service to use  
Use plant utilities and services to standard operating procedures |
| 3. Identify problems          | 3.1 Identify irregularities in performance of plant utilities and services  
Report irregularities to appropriate personnel |
RANGE OF VARIABLES:

Context:

Services include:

- **steam**
  - saturated – heating duty
  - superheated – mechanical duty
  - pressure/temperature/heat content relationship for saturated steam
  - purging
- **air**
  - instrument
  - process/mechanical duty
  - safety/long range breathers
  - mixing
- **water**
  - cooling
  - boiler feed
  - condensate
  - waste
- **nitrogen** – blanketing
- **carbon dioxide** – purging
- **steam** – quenching.

OH&S:

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the use of the utilities and services.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
**EVIDENCE GUIDE:**
This competency is typically performed by all plant operators.

**Critical Aspects:**
Consistent performance at the required standard should be demonstrated. In particular look to see that:
- services are correctly chosen for the task
- standard procedures are followed
- deviation from desired conditions are recognised.

**Concurrent Assessment and Prerequisites:**
This unit has no prerequisite competencies.
Individual enterprises may choose to add prerequisites relevant to their process.

**Essential Knowledge:**
Competence to include the ability to apply and explain
- different uses and methods of use of each service and utility
- differences between grades/types of services (eg grades of steam, instrument/safety air etc)
- hazards of operation of services.

**Assessment Method, Context and Resource Implications:**
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Operate Heat Exchangers  (PMA PROC 205 A)

UNIT DESCRIPTOR:
This competency covers the operation of heat exchangers. It includes the operation of heat exchangers which form part of a heating, cooling or refrigeration system.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Operate heat exchangers | Demonstrates the ability to:  
  1.1 Recognise the type of heat exchanger  
  1.2 Start up and shut down heat exchanger in a manner appropriate to the type and duty  
  1.3 Adjust flow rates, temperatures and pressure in a manner appropriate to the heat exchanger type  
  1.4 Start up from standby and after maintenance  
  1.5 Complete routine checks logs and paper work, taking action on unexpected readings and trends |
| 2. Solve heat exchanger problems | 2.1 Frequently and critically monitor all plant throughout shift  
  2.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant  
  2.3 Recognise operational problems  
  2.4 Analyse cause of operational problem  
  2.5 Take 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 standard procedures  
  3.3 Receive plant back from maintenance  
  3.4 Prepare plant for the introduction of chemicals/hydrocarbons and operation |
**RANGE OF VARIABLES:**

**Context:**
This competency is typically performed by an operator. Heat exchangers are found in most process manufacturing plants or units.

This competency unit includes all types of heat exchangers, such as

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

Duties covered include

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

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

Typical problems include

- care to be taken to avoid damage to the heat exchanger (overheating, over/underpressurising)
- factors which would affect efficiency of operation (scale build-up, fouling, internal leakage, turbulence, corrosion)
- leakage or gasket problems
- recognising when maintenance is required.

All operations are performed in accordance with standard operating procedures.

**OH&S:**
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the fundamental heat transfer processes, sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of heat exchangers (this includes pressure vessel requirements and leakage).

Thorough knowledge of enterprise standard operating procedures is required.
Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

Concurrent Assessment and Prerequisites:
For many enterprises, it will be appropriate for this unit to be assessed in conjunction with:
- PMAPROC201A Operate fluid flow equipment
- PMAPROC204A Use utilities and services
- PMACOM200A Process and record information

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:
Competence to include the ability to apply and explain
- Principles of operation, (including heat transfer)
- Physics of operation
- Isolate problem to item of equipment
- Corrective action appropriate to the problem cause
- Differing heat transfer rates applicable to gasses, liquids and solids
- The basis of the design
- Various cleaning methods including, backflushing, chemical cleaning, mechanical drilling and brushing and hydrostatic blasting
   as is relevant to the practical operation of equipment at that job level.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**
**Operate Separation Equipment**

**UNIT DESCRIPTOR:**
This competency covers the operation of separation equipment. It covers the range of dual phase separation equipment including filters, cyclones, demisters and the like.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Operate separation equipment | Demonstrates the ability to:  
1.1 Recognise the type of separation equipment  
1.2 Start up and shut down separation equipment in a manner appropriate to the type and duty  
1.3 Adjust flow and pressure in a manner appropriate to the equipment type  
1.4 Start up from standby and after maintenance  
1.5 Complete routine checks logs and paper work, taking action on unexpected readings and trends |
| 2. Solve separation equipment problems |  
2.1 Frequently and critically monitor all plant throughout shift  
2.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant  
2.3 Recognise operational problems  
2.4 Analyse cause of operational problem  
2.5 Take action to solve operational problems |
| 3. Carry out maintenance procedures |  
3.1 Isolate separation equipment and prepare for vessel entry or maintenance as required  
3.2 Complete minor maintenance according to standard procedures  
3.3 Receive plant back from maintenance  
3.4 Prepare plant for the introduction of chemicals and operation |
## RANGE OF VARIABLES:

### Context:
This competency is typically performed by all operators. Separation equipment of this type is found in many process manufacturing plants.

This competency unit includes all types of separation equipment for both gaseous, liquid and solids separation duties where the separation process is physical and the separator is not powered or motor driven.

This competency includes items of equipment such as:
- cyclones
- scrubbers
- demisters/drift eliminators
- hydrocyclones
- knockout drums
- filters (cartridge, basket, sand, etc).

This unit covers the operation of a stand alone separation process. Support equipment (if any) is covered by the relevant Process 200 series competency unit(s).

This unit does NOT cover specialised separation equipment covered by the following competencies:
- PMAPROC207A Operate powered separation equipment
- PMAPROC208A Operate chemical separation equipment.

This unit does NOT cover the operation of an integrated production unit which includes equipment ancillary to the main process unit which also needs to be understood, operated and controlled by the operator. This may be covered by one of:
- PMAHYD306A Produce product - gas absorption
- PMAHYD307A Produce product – dehydration
- PMAHYD309A Produce product – liquid extraction.

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 standard operating procedures.

### OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the separation process, sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of separation equipment.

Thorough knowledge of enterprise standard operating procedures is required.

**Assessment Focus:**

Assessment should establish the ability to start-up and shut down separation equipment correctly and also the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**EVIDENCE GUIDE:**

**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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.
Concurrent Assessment and Prerequisites:
There are no prerequisites.
For many enterprises it will be appropriate to assess this unit in conjunction with
- PMAPROC201A Operate fluid flow equipment
- PMAPROC204A Use utilities and services
- PMACOM200A Process and record information

Essential Knowledge:
Competence to include the ability to apply and explain
- principles of operation
- physics of operation
- behaviour of solids, liquids and gasses
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems
  (such as cartridges, baskets, supports, nozzles, grids, etc).
- and also the ability to distinguish between types and causes of separation problems
  as is relevant to the practical operation of equipment at that job level.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Operate Powered Separation Equipment*  
*(PMA PROC 207 A)*

**UNIT DESCRIPTOR:**
This competency covers the operation of powered separation equipment. It covers the range of powered, dual phase separation equipment, including, centrifuges, scraped filters, rotary vacuum filters and the like. This equipment is found in many process manufacturing plants.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Operate powered separation equipment | 1.1 Recognise the type of powered separation equipment  
1.2 Start up and shut down separation equipment in a manner appropriate to the type and duty  
1.3 Adjust flow and pressure in a manner appropriate to the equipment type  
1.4 Start up from standby and after maintenance  
1.5 Complete routine checks logs and paper work, taking action on unexpected readings and trends |
| 2. Operate separation equipment drivers | 2.1 Monitor critical variables such as amps, temperature, vibration, etc  
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 action to ensure driver is returned to full performance in a timely manner |
| 3. Solve separation equipment problems | 3.1 Frequently and critically monitor all plant throughout shift  
3.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant  
3.3 Recognise operational problems  
3.4 Analyse cause of operational problem  
3.5 Take action to solve operational problems |
| 4. Carry out maintenance procedures | 4.1 Isolate separation equipment and prepare for vessel entry or maintenance as required  
4.2 Complete minor maintenance according to standard procedures  
4.3 Receive plant back from maintenance  
4.4 Prepare plant for the introduction of chemicals/hydrocarbons and operation |
### RANGE OF VARIABLES:

**Context:**  
This competency is typically performed by all operators. Powered or driven separation equipment is found in many process manufacturing plants.

This competency unit includes all types of powered separation equipment for gaseous, liquid and solids separation duties.

This competency includes items of equipment such as:
- centrifuges
- rotary dryers
- rotary vacuum filters.

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

This unit covers the operation of a stand alone separation process. Support equipment (if any) is covered by the relevant Process 200 series competency unit(s).

This unit does NOT cover separation equipment covered by the following competencies:
- PMAPROC206A Operate separation equipment
- PMAPROC208A Operate chemical separation equipment.

This unit does NOT cover the operation of an integrated production unit which includes equipment ancillary to the main process unit which also needs to be understood, operated and controlled by the operator. This may be covered by one of:
- PMAHYD306A Produce product - gas absorption
- PMAHYD307A Produce product – dehydration
- PMAHYD309A Produce product – liquid extraction.

Typical problems include:
- seal/gasket leaks
- pressure loss/low flow
- blockages/build-up
- erosion/wear
- drive problems.

All operations are performed in accordance with standard operating procedures.

### OH&S:

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the separation process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of separation equipment.

Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:
Assessment should establish the ability to start-up and shut down powered separation equipment correctly and also the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.
Concurrent Assessment and Prerequisites:
There are no prerequisites.
For many enterprises it will be appropriate to assess this unit in conjunction with:

- PMAPROC201A Operate fluid flow equipment
- PMAPROC204A Use utilities and services
- PMACOM200A Process and record information.

Essential Knowledge:
Competence to include the ability to apply and explain

- principles of operation
- physics of operation (including kinetic energy effects)
- behaviour of solids, liquids and gasses
- function and troubleshooting of major internal components and their problems
  (such as internals, supports, nozzles, grids, scrapers, etc)
- corrective action appropriate to the problem cause.

and also the ability to distinguish between types and causes of:

- separation problems
- driver problems.

as is relevant to the practical operation of equipment at that job level.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
### UNIT TITLE:

**Operate Chemical Separation Equipment (PMA PROC 208 A)**

### UNIT DESCRIPTOR:

This competency covers the operation of 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.

### ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</thead>
</table>
| 1. Operate chemical separation equipment | Demonstrates the ability to:  
1.1 Recognise the type of chemical separation equipment  
1.2 Start up and shut down chemical separation equipment in a manner appropriate to the type and duty  
1.3 Adjust flow and pressure in a manner appropriate to the equipment type  
1.4 Start up from standby and after maintenance  
1.5 Complete routine checks logs and paper work, taking action on unexpected readings and trends |
| 2. Solve chemical separation equipment problems |  
2.1 Frequently and critically monitor all plant throughout shift  
2.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant  
2.3 Monitor the activity, reagents and separation efficiency of the equipment  
2.4 Recognise operational problems  
2.5 Analyse cause of operational problem  
2.6 Take action to solve operational problems |
| 3. Carry out maintenance procedures |  
3.1 Isolate separation equipment and prepare for vessel entry or maintenance as required  
3.2 Complete minor maintenance according to standard procedures  
3.3 Receive plant back from maintenance  
3.4 Prepare plant for the introduction of chemicals and operation |
RANGE OF VARIABLES:

Context:

This competency is typically performed by all operators. Chemical separation equipment is found in many process manufacturing plants.

This competency unit 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.

This competency includes items of equipment such as:
- crystallisers
- ion-exchange filters/columns
- precipitators
- absorbers/adsorbers.

This unit covers the operation of a stand alone separation process. Support equipment (if any) is covered by the relevant Process 200 series competency unit(s).

This unit does NOT cover separation equipment covered by the following competencies:
- PMAPROC206A Operate separation equipment
- PMAPROC207A Operate powered separation equipment.

This unit does NOT cover the operation of an integrated production unit which includes equipment ancillary to the main process unit which also needs to be understood, operated and controlled by the operator. This may be covered by one of:
- PMAHYD306A Produce product - gas absorption
- PMAHYD307A Produce product - dehydration
- PMAHYD309A Produce product - liquid extraction.

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 standard operating procedures.

OH&S:

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the separation process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of separation equipment.

Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:
Assessment should establish the ability to start-up and shut down separation equipment correctly and also the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:

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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.
Concurrent Assessment and Prerequisites:

There are no prerequisites.

For many enterprises it will be appropriate to assess this unit in conjunction with:

- PMAPROC201A Operate fluid flow equipment
- PMAPROC204A Use utilities and services
- PMACOM200A Process and record information.

Essential Knowledge:

Competence to include the ability to apply and explain:

- principles of operation
- physics of operation (including behaviour of solids, liquids and gasses, effects of phase changes, effects of temperature and pressure)
- chemistry of operation (including, simple chemical reactions, elements, compounds and mixtures)
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems (such as reagents, contaminants, supports, nozzles, grids, etc)
- and also the ability to distinguish between types and causes of separation problems as is relevant to the practical operation of equipment at that job level.

Assessment Method, Context and Resource Implications:

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Operate Particulates Handling Equipment (PMA PROC 210 A)

UNIT DESCRIPTOR:
This competency covers the operation of the range of equipment used to store and convey particulate solids. It includes the recognition, operation and troubleshooting of these routine plant items.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| **1. Operate mechanical conveyors and/or feeders** | **1.1** Recognise the type of conveyor/feeder  
**1.2** Start up and shut down conveyor/feeder in a manner appropriate to the conveyor type and duty  
**1.3** Complete routine checks logs and paper work, taking action on unexpected observations, readings and trends  
**1.4** Convey correct material from and to the correct location as required |
| **2 Operate pneumatic/vacuum conveyor** | **2.1** Recognise the type of conveyor  
**2.2** Start up and shut down conveyor in a manner appropriate to the conveyor type and duty  
**2.3** Complete routine checks logs and paper work, taking action on unexpected observations, readings and trends  
**2.4** Convey correct material from and to the correct location as required |
| **3. Operate fan/blower if appropriate** | **3.1** Recognise type of fan/blower  
**3.2** Start up and shut down fan/blower in a manner appropriate to its type and duty  
**3.3** Monitor critical variables such as amps, temperature, vibration etc and recognise trends/patterns which indicate a potential or actual problem with the fan/blower |
| **4. Manage particulates storages** | **4.1** Recognise type of storage facility  
**4.2** Monitor quality, quantity and location of solids stored  
**4.3** Transfer stock into, out of and between storages as required  
**4.4** Supply customers with correct quality and quantity in a timely manner  
**4.5** Make effective use of storage capacity available |
| **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 standard procedures  
**5.3** Receive plant back from maintenance  
**5.4** Prepare plant for the introduction of particulates and operation |
RANGE OF VARIABLES:

Context:
This competency is typically performed by many operators in a solids handling plant. It is a frequent starting point for operators to learn the operation of the plant as a whole.

This competency unit includes items of equipment such as:

a. mechanical conveyors/feeders
   - belt
   - vibrating
   - screw
   - flight
   - feeders such as
     - screw
     - star
     - slide
     - volumetric and weight

b. pneumatic
   - dense phase
   - disperse phase
   - pressure
   - vacuum

c. storage
   - silos
   - hoppers
   - purging hoppers
   - weigh bins/loss in weight bins.

It also includes 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.

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 standard operating procedures.
OH&S:

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

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

Knowledge and Enterprise Requirements:

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the particulates handling equipment.

Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:

Assessment should establish the ability to start-up and shut down the systems correctly and also the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:

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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.
Concurrent Assessment and Prerequisites:
There are no prerequisites.
This unit should be assessed in conjunction with:
- PMAPROC101A Make measurements
- PMAPROC102A Undertake housekeeping operations
- PMACOM100A Relay and respond to information.

Essential Knowledge:
Competence to include the ability to apply and explain
- principles of operation
- physics of operation
- properties of particulates
- density and bulk density
- good operating practice
- methods of resolving problems
and also the ability to
- distinguish between:
  - polymer/plastic/material
  - instrument
  - equipment (electrical/mechanical)
  - maintenance
  - cause of problem
- isolate problem to item of equipment
as is relevant to the practical operation of equipment at that job level.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

**Operate Manufacturing Extruders (PMA PROC 211 A)**

UNIT DESCRIPTOR:
This competency covers the operation of extruders which produce plastic granules/pellets from polymer resin. It includes the operation of equipment ancillary to the extruder including that used for adding masterbatch and other additives.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</thead>
<tbody>
<tr>
<td>1. Start up extruder systems</td>
<td>1.1 Perform pre-start-up checks&lt;br&gt;1.2 Start up individual items of equipment and the entire extrusion system&lt;br&gt;1.3 Start up normally and after maintenance&lt;br&gt;1.4 Build extrusion rate steadily&lt;br&gt;1.5 Produce to specified rate and quality within minimum time</td>
</tr>
<tr>
<td>2. Monitor and control the extrusion process</td>
<td>2.1 Complete routine checks, logs and paper work&lt;br&gt;2.2 Recognise and take action to minimise the impact on safety, health, the environment and the business of potential and actual problems&lt;br&gt;2.3 Inspect pellet/granule properties and recognise and correct problems&lt;br&gt;2.4 Monitor stock levels of feeds and products and take action to maintain production schedule and quality&lt;br&gt;2.5 Adjust plant to achieve required output rate and quality while maximising plant efficiency</td>
</tr>
<tr>
<td>3. Change production rates and/or product grade/specification</td>
<td>3.1 Predict from rates and schedule when a transition will be required&lt;br&gt;3.2 Manage transitions smoothly and in a timely manner&lt;br&gt;3.3 Minimise scrap/off grade as a result of a transition</td>
</tr>
<tr>
<td>4. Carry out maintenance procedures</td>
<td>4.1 Use measured/indicated data and smell, sight, sound and feel as appropriate to critically and frequently monitor all plant&lt;br&gt;4.2 Isolate extrusion equipment and prepare for maintenance as required&lt;br&gt;4.3 Test trips and alarms&lt;br&gt;4.4 Complete minor maintenance according to standard procedures&lt;br&gt;4.5 Receive plant back from maintenance&lt;br&gt;4.6 Prepare plant for the introduction of polymer and additives and operation</td>
</tr>
<tr>
<td>ELEMENT</td>
<td>PERFORMANCE CRITERIA</td>
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<tr>
<td>5. Shut down extrusion systems</td>
<td>5.1 Determine type of shut down required</td>
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<td></td>
<td>5.2 Give advanced warning of shut down where possible</td>
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<td></td>
<td>5.3 Change over individual items of equipment</td>
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<td></td>
<td>5.4 Shut down individual items of equipment and the entire extrusion system</td>
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<td></td>
<td>5.5 Shut down in an emergency when required</td>
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<td></td>
<td>5.6 Reset trips and alarms after a shut down</td>
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<td></td>
<td>5.7 Leave plant in a condition ready to restart</td>
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<td></td>
<td>5.8 Shut down for maintenance when required</td>
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<tr>
<td>6. Clean extruder</td>
<td>6.1 Identify cleaning requirements</td>
</tr>
<tr>
<td></td>
<td>Clean to requirements according to standard procedure</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
This competency is typically performed by experienced operators.

This competency unit includes all such 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
and may 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 standard operating procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

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

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the extruder.

Thorough knowledge of enterprise standard operating procedures is required. Some awareness of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.
### Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

### EVIDENCE GUIDE:

#### Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- early warning signs of equipment in need of attention/with potential problems are recognised
- possible causes of a plant trip are recognised and action taken to avoid a trip
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

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

### Concurrent Assessment and Prerequisites:
For many enterprises, it will be appropriate for this unit to be assessed in conjunction with:
- PMAPROC210A Operate particulates processing equipment
- PMAPROC305A Operate process control systems.

Whenever the extrusion system is controlled by an advanced control system such as DCS (Distributed Control System), PMAPROC305A is a co-requisite.

This unit has no prerequisite competencies.

Individual enterprises may choose to add other prerequisites relevant to their process.
**Essential Knowledge:**

- Competence to include the ability to apply and explain
  - principles of operation
  - physics of operation
  - properties of materials being extruded
  - temperature and viscosity effects
  - isolate problem to item of equipment
  - methods of resolving problems

and also the ability to distinguish between:

- polymer/plastic
- instrument
- equipment (electrical/mechanical)
- maintenance

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 extrusion system.

**Assessment Method, Context and Resource Implications:**

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
Overlay competency:

Use infotechnology devices in the workplace (TDT K12A)

Original Unit Details

Source:
Transport and Distribution Industry Standards (TDT)

Number:
Unit K2

Title:
Use infotechnology devices in the workplace

Unit Descriptor:
This unit applies to employees who use computers as part of work processes.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables:
Within the process manufacturing industry (chemical, hydrocarbons and oil refining sectors), this unit applies to all jobs using personal computers either in the plant or the warehouse. It does not apply to computerised process control functions.

Evidence Guide:

Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
This unit of competence may be assessed in conjunction with other units that for part of a job role or function.

Underpinning Knowledge and Skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications
These are identical to the original unit.

Key Competencies
These are identical to the original unit.
UNIT TITLE:

Package Product/Material (PMA PROC 213 A)

UNIT DESCRIPTOR:
This competency covers all operations related to the packaging of materials and products.

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<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td></td>
<td>Demonstrates the ability to:</td>
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</tbody>
</table>
| 1. Prepare equipment and materials for packaging | 1.3 Identify type, quantity and quality of product to be packed according to documentation  
1.4 Identify the range of packaging materials and ancillaries and their specific functions  
1.5 Insure packaging materials are available in accordance to documentation  
1.6 Select and prepare packaging materials according to compatibility with content, in accordance with standard operating procedures  
1.7 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 Set up line for required quantity of product in accordance with standard operating procedures  
2.5 Select label according to standard operating procedures |
| 3. Package product | 3.1 Package product in accordance with standard operating procedures  
3.2 Check that packaged product complies with specification  
3.3 Fill out all documentation in accordance with standard operating procedures |
RANGE OF VARIABLES:

Context:
This competency unit includes:

a. indicative functions such as:
   - packaging
   - labelling
   - storage
   - verification of product type, quantity and quality
   - calculation of actual packaged product against documentation

b. resources such as:
   - labelling equipment
   - packaging materials
   - documentation
   - lifting/transporting equipment.

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

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them.

Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:
Assessment should establish the ability to follow procedures, recognise situations requiring action, and then efficiently implement the action specified in the standard procedures.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:
This competency is typically performed by operators or stores personnel.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- there is an understanding of the different handling and storage requirements for each different product
- standard operating procedures are followed
- deviations from desired conditions are recognised.

Concurrent Assessment and Prerequisites:
This unit has no prerequisite competencies.

Individual enterprises may choose to add prerequisites and co-requisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply the standard procedures. It includes an awareness of:
- OH&S and legislative requirements relating to safe manual handling/lifting,
- OH&S & legislative requirements relating to dangerous goods
- HAZCHEM and labelling requirements
- material safety data sheets
- compatibility of packaging materials with content
- effect of temperature and pressure on properties of substances
- fundamental electrical principles including static electricity.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

It is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
Overlay competency:

Operate a forklift (TDT D10A)

Original Unit Details

Source:
Transport and Distribution Industry Standards

Number:
Unit D10

Title:
Operate a forklift

Unit Descriptor:
Knowledge and skills to operate a forklift safely, including systematic and efficient control of all vehicle functions and effective management of hazardous situations.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables:
Within the process manufacturing industry (chemical, hydrocarbons and oil refining sectors), this unit applies to warehousing and stores jobs or those circumstances where an employee is required to move loads using a forklift.

Evidence Guide

Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
Nil however this unit may be assessed in conjunction with other units that form part of a job role or function.

Underpinning Knowledge and Skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit.

Key Competencies:
These are identical to the original unit.
Overlay Competency:

Manufacture paints  (ICP IM 31A)

Original Unit Details

Source:
Printing and Graphic Arts Industry Standards

Number:
Unit IM31c

Title:
Manufacture inks/coatings

Unit Descriptor:
This unit covers the dispersing of pigment and related operations to make inks and coatings.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables:
Within the process manufacturing industry (chemical, hydrocarbons and oil refining sectors), this unit applies to the manufacture of paint and similar coating. The range of equipment covered by this unit should be extended to include that typically used by the paint industry.

Evidence Guide

Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
Nil.

Essential Knowledge and Skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit.

Key Competencies:
These are identical to the original unit.
Operate and monitor boiler steam/water cycle (UTU NEG 162A)

Overlay Competency:

Operate and monitor boiler steam/water cycle (UTU NEG 162A)

Original Unit Details

Source:
National Utilities ITAB - National Generation Competency Standards

Number:
Unit NEG 162

Title:
Operate and monitor boiler steam/water cycle

Unit Descriptor:
This unit refers to the operation, inspection and monitoring of a boiler steam/water cycle.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables:
Within the process manufacturing industry (chemical, hydrocarbons and oil refining sectors), this unit applies to ‘intermediate boiler tickets’ - i.e., those firing a single fuel at a time. ‘Basic boiler tickets’ apply to package boilers and should use PMAPRO100a ‘Apply procedures to process operation’.

Evidence Guide

Critical Aspects:
These are identical to the original unit. There may be a regulatory requirements to have a ‘boiler ticket’.

Concurrent Assessment and Prerequisites:
Nil.

Essential Knowledge and Skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit. Any regulatory requirements must be complied with.

Key Competencies:
These are identical to the original unit.
Overlay Competency: Process 217

Manage, operate and monitor turbine (UTU NEG 210A)

Original Unit Details

Source:
National Utilities ITAB - National Generation Competency Standards

Number:
Unit NEG 210

Title:
Manage, operate and monitor turbine

Unit Descriptor:
This unit refers to the management of an in-service steam turbine.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables:
Within the process manufacturing industry (chemical, hydrocarbons and oil refining sectors), this unit applies to ‘turbine tickets’.

Evidence Guide

Critical Aspects:
These are identical to the original unit. There may be a regulatory requirement to have a ‘turbine ticket’.

Concurrent Assessment and Prerequisites:
Nil.

Essential knowledge and skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit. Any regulatory requirements must be complied with.

Key Competencies:
These are identical to the original unit.
UNIT TITLE: Operate A Production Unit (PMA PROC 300 A)

UNIT DESCRIPTOR:
This competency covers the operation of a unit of equipment which includes the operation of equipment ancillary to the main unit.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Start up unit</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td></td>
<td>1.1 Perform pre-start-up checks</td>
</tr>
<tr>
<td></td>
<td>1.2 Start up individual items of equipment and the entire unit</td>
</tr>
<tr>
<td></td>
<td>1.3 Start up normally and after maintenance</td>
</tr>
<tr>
<td></td>
<td>1.4 Build rate steadily</td>
</tr>
<tr>
<td></td>
<td>1.5 Stabilise operation to produce specified rate and quality within minimum time</td>
</tr>
<tr>
<td>2. Monitor and control the unit</td>
<td>2.1 Complete routine checks, logs and paper work</td>
</tr>
<tr>
<td></td>
<td>2.2 Recognise the signs of potential and actual problems</td>
</tr>
<tr>
<td></td>
<td>2.3 Take action to minimise the impact on safety, health, the environment and the business of potential and actual problems</td>
</tr>
<tr>
<td></td>
<td>2.4 Monitor critical variables and take action as required</td>
</tr>
<tr>
<td></td>
<td>2.5 Trim plant to achieve required output rate and quality while maximising plant efficiency</td>
</tr>
<tr>
<td>3. Change unit output rate, grade or specification</td>
<td>3.1 Predict the need to make a change to meet process requirements</td>
</tr>
<tr>
<td></td>
<td>3.2 Trim unit in preparation of changes</td>
</tr>
<tr>
<td></td>
<td>3.3 Make changes as required</td>
</tr>
<tr>
<td></td>
<td>3.4 Manage changes smoothly and in a timely manner</td>
</tr>
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<td></td>
<td>3.5 Minimise out of specification product/process disruptions as a result of the change</td>
</tr>
<tr>
<td>4. Maintain plant effectiveness</td>
<td>4.1 Frequently and critically monitor all plant throughout shift</td>
</tr>
<tr>
<td></td>
<td>4.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant</td>
</tr>
<tr>
<td></td>
<td>4.3 Critical equipment/processes are identified and their performance tuned</td>
</tr>
<tr>
<td></td>
<td>4.4 Issues likely to impact on plant performance are identified and appropriate action taken</td>
</tr>
<tr>
<td></td>
<td>4.5 Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people</td>
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<td></td>
<td>4.6 Test trips and alarms</td>
</tr>
<tr>
<td></td>
<td>4.7 Prepare plant for maintenance/vessel entry as required</td>
</tr>
<tr>
<td></td>
<td>4.8 Complete minor maintenance according to standard procedures</td>
</tr>
<tr>
<td></td>
<td>4.9 Receive plant back from maintenance</td>
</tr>
<tr>
<td></td>
<td>4.10 Prepare plant for the introduction of chemicals and operation</td>
</tr>
<tr>
<td>5. Shut down unit</td>
<td>5.1 Determine type of shut down required</td>
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</tr>
<tr>
<td></td>
<td>5.2 Give advance warning of shut down where possible</td>
</tr>
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<td></td>
<td>5.3 Change over individual items of equipment</td>
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<td></td>
<td>5.4 Shut down individual items of equipment and the entire unit</td>
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<tr>
<td></td>
<td>5.5 Shut down to a standby condition if appropriate</td>
</tr>
<tr>
<td></td>
<td>5.6 Shut down in an emergency when required</td>
</tr>
<tr>
<td></td>
<td>5.7 Reset trips and alarms after a shut down</td>
</tr>
<tr>
<td></td>
<td>5.8 Leave plant in a condition ready to restart</td>
</tr>
<tr>
<td></td>
<td>5.9 Shut down for maintenance when required</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:

This competency is typically performed by more experienced operators.

This competency may be performed independently in a plant with local control or in liaison with the control room operator in a plant with DCS type control.

This competency unit includes units of equipment where the operator is expected to demonstrate a significant understanding of the process and the equipment operation AND where the unit involves at least two other prerequisite process competencies which must be operated as part of the unit. The other 300 stream process competencies should be used as an indicative guide. This competency is for enterprise specific equipment units which are not otherwise described.

It does NOT include the operation of any packaged unit (regardless of its engineering complexity) which are covered by PMAPROC100A ‘Apply procedures to equipment 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 storages
- 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 standard operating procedures.

**OH&S:**

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the unit.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

**Assessment Focus:**

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- possible causes of a plant trip are recognised and action taken to avoid a trip
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

Competence must be demonstrated in the operation of all ancillary equipment to the level specified in the relevant competency unit.

Concurrent Assessment and Prerequisites:
This competency has the prerequisite of at least two of the following competencies:

- PMAPROC202A Operate fluid mixing equipment
- PMAPROC203A Handle goods
- PMAPROC204A Use utilities and services
- PMAPROC205A Operate heat exchangers
- PMAPROC206A Operate separation equipment
- PMAPROC207A Operate powered separation equipment
- PMAPROC208A Operate chemical separation equipment
- PMAPROC209A Undertake tank farming operations
- PMAPROC210A Operate particulates processing equipment
- PMAPROC211A Operate manufacturing extruders
- PMAPROC212A Use infotechnology devices in the workplace.

Individual enterprises may choose to add other prerequisites relevant to their process.
### Essential Knowledge:

Competence to include the ability to apply and explain
- principles of operation
- physics of operation
- chemistry of operation (where relevant)
and also the ability to
- isolate problem to item of equipment
- distinguish between:
  - process material (chemical/hydrocarbon/oil/gas),
  - instrument,
  - equipment (electrical/mechanical),
  - maintenance
  - cause of 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 unit.

### Assessment Method, Context and Resource Implications:

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

**Operate Distillation Units**  
(PMA PROC 301 A)

UNIT DESCRIPTOR:
This competency covers the operation of all distillation units typically encountered on a plant. It includes the operation of equipment ancillary to the column itself.

<table>
<thead>
<tr>
<th>ELEMENTS</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Start up distillation unit</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1</td>
<td>Perform pre-start up checks</td>
</tr>
<tr>
<td>1.2</td>
<td>Start up individual items of equipment and entire distillation system</td>
</tr>
<tr>
<td>1.3</td>
<td>Monitor temperature increase during start up and take corrective action</td>
</tr>
<tr>
<td>1.4</td>
<td>Stabilise distillation system to produce specified rate and quality within minimum time</td>
</tr>
<tr>
<td>2. Monitor distillation unit</td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Complete routine checks, logs and paper work</td>
</tr>
<tr>
<td>2.2</td>
<td>Recognise the signs of potential and actual problems</td>
</tr>
<tr>
<td>2.3</td>
<td>Take action to minimise the impact on safety, health, the environment and the business of potential and actual problems</td>
</tr>
<tr>
<td>2.4</td>
<td>Monitor condition of feed and take action to maintain production schedule and quality</td>
</tr>
<tr>
<td>2.5</td>
<td>Trim plant to achieve required rates and quality while maximising plant efficiency</td>
</tr>
<tr>
<td>3. Change production rates and/or product specification</td>
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</tr>
<tr>
<td>3.1</td>
<td>Predict the need to make change to meet process requirements</td>
</tr>
<tr>
<td>3.2</td>
<td>Manipulate unit temperatures to achieve product specifications</td>
</tr>
<tr>
<td>3.3</td>
<td>Trim plant in a manner which prepares it for the transition</td>
</tr>
<tr>
<td>3.4</td>
<td>Manage transitions smoothly and in a timely manner</td>
</tr>
<tr>
<td>3.5</td>
<td>Minimise out of specification material as a result of a transition</td>
</tr>
<tr>
<td>4. Maintain distillation plant effectiveness</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Frequently and critically monitor all distillation equipment throughout shift</td>
</tr>
<tr>
<td>4.2</td>
<td>Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor distillation equipment</td>
</tr>
<tr>
<td>4.3</td>
<td>Critical equipment/processes are identified and their performance tuned</td>
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<tr>
<td>4.4</td>
<td>Issues likely to impact on plant performance are identified and appropriate action taken</td>
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<td>4.5</td>
<td>Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people</td>
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<td>4.6</td>
<td>Test trips and alarms</td>
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<td>4.7</td>
<td>Prepare plant for maintenance/vessel entry as required</td>
</tr>
<tr>
<td>4.8</td>
<td>Complete minor maintenance according to standard procedures</td>
</tr>
<tr>
<td>4.9</td>
<td>Receive plant back from maintenance</td>
</tr>
<tr>
<td>4.10</td>
<td>Prepare plant for the introduction of hydrocarbons/chemicals and operation</td>
</tr>
</tbody>
</table>
5. Shut down distillation systems

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Determine type of shut down required</td>
</tr>
<tr>
<td>5.2</td>
<td>Give advanced warning of shut down where possible</td>
</tr>
<tr>
<td>5.3</td>
<td>Change over individual items of equipment</td>
</tr>
<tr>
<td>5.4</td>
<td>Shut down individual items of equipment and the entire reaction system</td>
</tr>
<tr>
<td>5.5</td>
<td>Shut down to a stand-by condition if required</td>
</tr>
<tr>
<td>5.6</td>
<td>Shut down in an emergency when required</td>
</tr>
<tr>
<td>5.7</td>
<td>Reset trips and alarms after a shut down</td>
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<tr>
<td>5.8</td>
<td>Leave plant in a condition ready to restart</td>
</tr>
<tr>
<td>5.9</td>
<td>Shut down for maintenance when required</td>
</tr>
</tbody>
</table>
## RANGE OF VARIABLES

**Context:**
This competency may be performed independently in a plant with local control or in liaison with the control room operator in a plant with Distributed Control System (DCS) type control.

- **Bottoms controls include:**
  - liquid level
  - reboiler flow
  - reboiler outlet temperature
  - alternatives to reboiler outlet temperature control.

- **Overhead controls include:**
  - reflux rates
  - reflux ratios
  - overhead temperatures
  - condenser outlet temperatures.

- **Systems used in distillation include:**
  - packed columns (different types of packing)
  - tray columns (types of trays).

- **Routine checks include:**
  - temperature
  - pressure
  - levels
  - differential pressure
  - control valve position.

- **Measures of control include:**
  - boil up rate and temperature
  - feed rate, temperature and composition
  - internal and external reflux.

- **Problems with distillation towers include:**
  - flooding
  - channelling (packed column)
  - priming
  - dumping
  - coning
  - entrainment.

All operations are performed in accordance with standard operating procedures.
**OH&S:**

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the distillation unit.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

**Assessment Focus:**

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
Critical Aspects:

This competency is typically performed by more experienced operators.

It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- possible causes of a plant trip recognised and action taken to avoid a trip
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

Competence must be demonstrated in the operation of all ancillary equipment to the level specified in the relevant competency unit.

Concurrent Assessment and Prerequisites:

This unit has the prerequisite competencies of:

- PMAPROC201A Operate fluid flow equipment
- PMAPROC204A Use utilities and services
- PMAPROC205A Operate heat exchangers.

Individual enterprises may choose to add other prerequisites relevant to their process.
**Essential Knowledge:**

Competence to include the ability to apply and explain:

- principles of operation
- physics of operation
- physical chemistry of operation
- isolate problem to item of equipment
- understand the effects of temperature and pressure on properties of substances

and also the ability to distinguish between:

- chemical/material/feed
- instrument
- equipment (electrical/mechanical)
- maintenance cause of 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 distillation system.

**Assessment Method, Context and Resource Implications:**

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Operate Reactors And Reaction Equipment (PMA PROC 302 A)

UNIT DESCRIPTOR:
This competency covers 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.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Start up reaction systems</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Perform pre-start-up checks</td>
<td></td>
</tr>
<tr>
<td>1.2 Start up individual items of equipment and the entire reactor system</td>
<td></td>
</tr>
<tr>
<td>1.3 Start up from standby and after maintenance</td>
<td></td>
</tr>
<tr>
<td>1.4 Build reaction rate steadily with no surges or lulls</td>
<td></td>
</tr>
<tr>
<td>1.5 Stabilise reaction system to produce in specification product at specified rates within minimum time</td>
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</tr>
<tr>
<td>2. Monitor and control the reaction process</td>
<td></td>
</tr>
<tr>
<td>2.1 Complete routine checks logs and paper work</td>
<td></td>
</tr>
<tr>
<td>2.2 Recognise the signs of potential and actual problems</td>
<td></td>
</tr>
<tr>
<td>2.3 Take action to minimise the impact on safety, health, the environment and the business of potential and actual problems</td>
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<tr>
<td>2.4 Monitor condition of catalyst (if appropriate) and take action to maintain production schedule and quality</td>
<td></td>
</tr>
<tr>
<td>2.5 Monitor materials and stock levels of feeds and take action to maintain production schedule and quality</td>
<td></td>
</tr>
<tr>
<td>2.6 Trim plant to achieve required rates and quality while maximising plant efficiency</td>
<td></td>
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<tr>
<td>3. Change production rates and/or product grade/specification</td>
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<tr>
<td>3.1 Predict from rates and schedule when a transition will be required</td>
<td></td>
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<tr>
<td>3.2 Give advanced notice of transition to work team</td>
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</tr>
<tr>
<td>3.3 Trim plant in a manner which prepares it for the transition.</td>
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<tr>
<td>3.4 Manage transitions smoothly and in a timely manner</td>
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<tr>
<td>3.5 Minimise scrap/off grade as a result of a transition</td>
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</tbody>
</table>
## 4. Maintain plant effectiveness

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<table>
<thead>
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</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Frequently and critically monitor all plant throughout shift</td>
</tr>
<tr>
<td>4.2</td>
<td>Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant</td>
</tr>
<tr>
<td>4.3</td>
<td>Critical equipment/processes are identified and their performance tuned</td>
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<td>4.4</td>
<td>Issues likely to impact on plant performance are identified and appropriate action taken</td>
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<td>4.5</td>
<td>Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people</td>
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<td>4.6</td>
<td>Test trips and alarms</td>
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<td>4.7</td>
<td>Prepare plant for maintenance/vessel entry as required</td>
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<tr>
<td>4.8</td>
<td>Complete minor maintenance according to standard procedures</td>
</tr>
<tr>
<td>4.9</td>
<td>Receive plant back from maintenance</td>
</tr>
<tr>
<td>4.10</td>
<td>Prepare plant for the introduction of chemicals and operation</td>
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</tbody>
</table>

## 5. Shut down reaction systems

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Determine type of shut down required</td>
</tr>
<tr>
<td>5.2</td>
<td>Give advanced warning of shut down where possible</td>
</tr>
<tr>
<td>5.3</td>
<td>Change over individual items of equipment</td>
</tr>
<tr>
<td>5.4</td>
<td>Shut down individual items of equipment and the entire reaction system</td>
</tr>
<tr>
<td>5.5</td>
<td>Shut down to a stand-by condition if required</td>
</tr>
<tr>
<td>5.6</td>
<td>Shut down in an emergency when required</td>
</tr>
<tr>
<td>5.7</td>
<td>Reset trips and alarms after a shut down</td>
</tr>
<tr>
<td>5.8</td>
<td>Leave plant in a condition ready to restart</td>
</tr>
<tr>
<td>5.9</td>
<td>Shut down for maintenance when required</td>
</tr>
</tbody>
</table>

## 6. Clean reactors/vessels

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Identify cleaning requirements</td>
</tr>
<tr>
<td>6.2</td>
<td>Clean to requirements according to standard procedure</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES

Context:
This competency is typically performed by more experienced operators.

This competency may be performed independently in a plant with local control or in liaison with the control room operator in a plant with Distributed Control System (DCS) type control.

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.

This competency unit covers types of reactors such as:

- batch.
- continuous.
- catalytic.
- fluidised bed.

Typical problems include:

- variations in catalyst activity
- control of exotherm/endotherm
- variations in feed rates/quality.

All operations are performed in accordance with standard operating procedures.

OH&S:

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Operators should be able to determine safe working practice using the relevant material safety data sheets.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the reaction system.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- early warning signs of equipment in need of attention/with potential problems are recognised
- possible causes of a plant trip recognised and action taken to avoid a trip
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

Competence must be demonstrated in the operation of all ancillary equipment to the level specified in the relevant competency unit.
**Concurrent Assessment and Prerequisites:**

This unit has the prerequisite competencies of:

- PMAPROC201A Operate fluid flow equipment
- PMAPROC202A Operate fluid mixing equipment
- PMAPROC205A Operate heat exchangers.

Individual enterprises may choose to add other prerequisites relevant to their process.

**Essential Knowledge:**

Competence to include the ability to apply and explain

- principles of operation
- physics of operation
- chemistry of operation
- type of reactor(s) used and their characteristics (advantages and limitations)
- methods of controlling the reaction (including rate and yield)
- methods of resolving problem

and also the ability to:

- distinguish between elements, compounds and mixtures in their raw materials and products
- describe reaction in chemical terms, including the effect of changing reaction variables (eg, temperature, pressure, catalyst, concentration, pH)
- isolate problem to item of equipment
- distinguish between:
  - chemical
  - instrument
  - equipment (electrical/mechanical)
  - maintenance
- causes of 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 reaction system.
Assessment Method, Context and Resource Implications:

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
### UNIT TITLE:

Operate Furnaces (PMA PROC 303 A)

### UNIT DESCRIPTOR:
This competency covers the operation of a furnace which may be used to cause and control the cracking of oil or gas or other process function. It includes the operation of equipment ancillary to the main furnace.

### ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Start up furnace | Demonstrates the ability to:  
| | 1.1 Perform pre-start-up checks  
| | 1.2 Start up individual items of equipment and the entire furnace system  
| | 1.3 Start up from standby and after maintenance  
| | 1.4 Build production rate steadily with no surges or lulls  
| | 1.5 Stabilise system to produce in specification product at specified rates within minimum time  
| 2. Monitor and control the reaction process | 2.1 Complete routine checks logs and paper work  
| | 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 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  

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| 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 Critical equipment/processes are identified and their performance tuned  
4.4 Issues likely to impact on plant performance are identified and appropriate action taken  
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 standard procedures  
4.9 Receive plant back from maintenance  
4.10 Prepare plant for the introduction of hydrocarbons and operation |
|---|---|
| 5. Shut down furnace | 5.1 Determine type of shut down required  
5.2 Give advanced warning of shut down where possible  
5.3 Change over individual items of equipment  
5.4 Shut down individual items of equipment and the entire furnace system  
5.5 Shut down to a stand-by condition if required  
5.6 Shut down in an emergency when required  
5.7 Reset trips and alarms after a shut down  
5.8 Leave plant in a condition ready to restart  
5.9 Shut down for maintenance when required |
### RANGE OF VARIABLES:

**Context:**

This competency is typically performed by more experienced operators.

This competency may be performed independently in a plant with local control or in liaison with the control room operator in a plant with Distributed Control System (DCS) type control.

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

- pumps
- valves
- utilities and services
- heat exchangers and/or scrubbers

and may also include other equipment as well as the furnace itself.

This competency unit covers items of equipment such as:

- thermal cracking furnaces
- catalytic cracking furnaces
- cabin type
- cylindrical or vertical.

It does NOT include packaged furnaces which are covered by PMAPROC100A ‘Operate equipment’.

**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.

All operations are performed in accordance with standard operating procedures.

**OH&S:**

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the furnace system.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- possible causes of a plant trip are recognised and action taken to avoid a trip
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

Competence must be demonstrated in the operation of all ancillary equipment to the level specified in the relevant competency unit.
Concurrent Assessment and Prerequisites:
This unit has the prerequisite competencies of:
- PMAPROC201A Operate fluid flow equipment
- PMAPROC204A Use utilities and services
and at least one of
- PMAPROC205A Operate heat exchangers
- PMAPROC206A Operate separation equipment
- PMAPROC207A Operate powered separation equipment
- PMAPROC208A Operate chemical separation equipment.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply and explain
- principles of operation
- furnace components such as
  - burner
  - convection section
  - radiation section
  - floor/walls
  - stack/damper (flue type)
- insulation (refractory)
- physics of operation
- chemistry of operation
- combustion principles, draft, burner design, excess air/flue CO/CO₂
- importance of flame patterns/flame impingement
- methods of resolving problem
and also the ability to
- distinguish between:
  - chemical (including combustion),
  - instrument,
  - equipment (electrical/mechanical),
  - maintenance cause of problem
- isolate problem to item of equipment
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.
Assessment Method, Context and Resource Implications:

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Operate Compressors (PMA PROC 304 A)

UNIT DESCRIPTOR:

This competency covers the operation of high pressure and volume gas compressors. It includes the operation of equipment ancillary to the compressor.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Start up compressor</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Perform pre-start-up checks</td>
<td></td>
</tr>
<tr>
<td>1.2 Start up individual items of equipment and the entire compressor system</td>
<td></td>
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<tr>
<td>1.3 Start up normally and after maintenance</td>
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<tr>
<td>1.4 Build pressure steadily with no surging</td>
<td></td>
</tr>
<tr>
<td>1.5 Stabilise compressor system to produce specified pressures and flows within minimum time</td>
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</tr>
<tr>
<td>2. Monitor and control the compressor</td>
<td>2.1 Complete routine checks, logs and paper work</td>
</tr>
<tr>
<td>2.2 Recognise the signs of potential and actual problems</td>
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<tr>
<td>2.3 Take action to minimise the impact on safety, health, the environment and the business of potential and actual problems</td>
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<tr>
<td>2.4 Monitor temperatures and lubrication oil and take action as required</td>
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<tr>
<td>2.5 Trim plant to achieve required pressures and flows while maximising plant efficiency</td>
<td></td>
</tr>
<tr>
<td>3. Change compressor output</td>
<td>3.1 Predict the need to change compressor output to meet process requirements</td>
</tr>
<tr>
<td>3.2 Change compressor output as required.</td>
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</tr>
<tr>
<td>3.3 Manage changes smoothly and in a timely manner</td>
<td></td>
</tr>
<tr>
<td>4. Maintain plant effectiveness</td>
<td>4.1 Frequently and critically monitor all plant throughout shift</td>
</tr>
<tr>
<td>4.2 Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant</td>
<td></td>
</tr>
<tr>
<td>4.3 Identify critical equipment/processes and tune their performance</td>
<td></td>
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<tr>
<td>4.4 Identify issues likely to impact on plant performance and take appropriate action</td>
<td></td>
</tr>
<tr>
<td>4.5 Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people</td>
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<tr>
<td>4.6 Test trips and alarms</td>
<td></td>
</tr>
<tr>
<td>4.7 Prepare plant for maintenance/vessel entry as required</td>
<td></td>
</tr>
<tr>
<td>4.8 Complete minor maintenance according to standard procedures</td>
<td></td>
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<tr>
<td>4.9 Receive plant back from maintenance</td>
<td></td>
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<tr>
<td>4.10 Prepare plant for the introduction of gas and operation</td>
<td></td>
</tr>
</tbody>
</table>
### 5. Shut down compressor

<p>| | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Determine type of shutdown required</td>
</tr>
<tr>
<td>5.2</td>
<td>Give advanced warning of shutdown where possible</td>
</tr>
<tr>
<td>5.3</td>
<td>Change over individual items of equipment</td>
</tr>
<tr>
<td>5.4</td>
<td>Shut down individual items of equipment and the entire compressor system</td>
</tr>
<tr>
<td>5.5</td>
<td>Shut down in an emergency when required</td>
</tr>
<tr>
<td>5.6</td>
<td>Reset trips and alarms after a shut down</td>
</tr>
<tr>
<td>5.7</td>
<td>Leave plant in a condition ready to restart</td>
</tr>
<tr>
<td>5.8</td>
<td>Shut down for maintenance when required</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

**Context:**
This competency is typically performed by more experienced operators.

This competency may be performed independently in a plant with local control or in liaison with the control room operator in a plant with Distributed Control System (DCS) type control.

This competency unit includes items of equipment typified by:
- reciprocating compressors
- rotary compressors (eg, screw, centrifugal)

which are distinguished by features such as:
- multistage compression
- intercoolers
- advanced lubrication systems

It does NOT include packaged compressors which are covered by PMAPROC100A ‘Operate equipment’

This competency unit includes all such items of equipment and unit operations which form part of the compressor system. Typically this will include:
- pumps (lubrication and cooling pumps),
- utilities and services
- heat exchangers (intercoolers)
and may also include other equipment as well as the compressor itself.

Typical problems include:
- surging
- control of temperature and pressure
- variations in feed.

All operations are performed in accordance with standard operating procedures.

**OH&S:**
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the compressor system.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- possible causes of a plant trip are recognised and action taken to avoid a trip
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

Competence must be demonstrated in the operation of all ancillary equipment to the level specified in the relevant competency unit.
Concurrent Assessment and Prerequisites:
This unit has the prerequisite competencies of:

- PMAPROC201A Operate fluid flow equipment
- PMAPROC204A Use utilities and services
- PMAPROC205A Operate heat exchangers.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply and explain

- principles of operation
- physics of operation
- effects of temperature and compression ratio/the need for multi staging
- pressure/temperature relationships and effects on condensation (eg moisture and/or gas)
- control of output
- causes and remedies for surging
- methods of resolving problem

and also the ability to

- distinguish between:
  - process gas,
  - instrument,
  - equipment (electrical/mechanical),
  - maintenance
  - cause of problem

- isolate problem to item of equipment

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 compressor system.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:
Operate Process Control Systems  (PMA PROC 305 A)

UNIT DESCRIPTOR:
This unit of competence concerns the operation of control systems, such as a control panel, independent of the process which is being controlled.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Navigate through the control panel system | Demonstrates the ability to:  
1.1 Use keyboards, track ball and monitor to access control panel  
1.2 Use page links to move between graphics  
1.3 Acknowledge messages and alarms  
1.4 Operate under abnormal conditions  
1.5 Access recent information from screen displays  
1.6 Record and report control system malfunctions in accordance with standard operating procedures |
| 2. Monitor control systems |  
2.1 Call up graphics, trends message and alarm pages  
2.2 Identify the status of individual pieces of equipment from the control panel  
2.3 Check historical data (trends and messages)  
2.4 Expand trends  
2.5 Access relative parameter settings  
2.6 Distinguish between high and low priority alarms  
2.7 Maintain required operational conditions |
| 3. Identify cause of variation |  
3.1 Analyse cause(s) of frequent alarms/messages  
3.2 Record nature of variations/irregularities in accordance with standard operating procedure  
3.3 Determine and report the impact of process variations/irregularities to appropriate personnel  
3.4 Identify maintenance requirements where appropriate  
3.5 Request additional sampling or testing |
| 4. Adjust process conditions |  
4.1 Optimise plant operating conditions  
4.2 Optimise plant operation within alarm parameters  
4.3 Activate correct sequences to perform plant jobs  
4.4 Recognise equipment giving a “bad signal” or a “bad measurement” and take action.  
4.5 Predict possible problems and institutes appropriate corrective action  
4.6 Adjust process in response to test results and instrumentation  
4.7 Adjustments and variations to specifications/schedules recorded and reported to appropriate personnel |
| 5. Start up and shut down process | 5.1 Start up and shut-down systems from the control panel according to standard operating procedures  
5.2 Start up and shut-down individual pieces of equipment from the control panel according to standard operating procedures  
5.3 Select equipment and alter operating conditions, set points and settings.  
5.4 Activate correct sequences to perform plant jobs |
**RANGE STATEMENT:**

**Context:**
This competency applies to all the equipment controlled by and operated through a control panel. The control panel will be a Distributed Control System (DCS) or similar control system.

This competency unit typically applies to all plant operators/technicians who use a DCS or similar system to operate/control the plant or plant units/areas.

All operations are performed in accordance with standard operating procedures.

**OH&S:**
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the processes governed by the system sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the process units or areas under control.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring intervention, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
Critical Aspects:
It is essential that plant processes be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble, rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- early warning signs of equipment needing attention/with potential problems are recognised
- possible causes of a plant trip are recognised and action taken to avoid a trip
- action is taken to ensure timely return of equipment to full performance
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

Competence must be demonstrated in the operation of all ancillary equipment to the level specified in the relevant competency unit.

Concurrent Assessment and Prerequisites:
For many enterprises, it will be appropriate to assess this unit in conjunction with:
- PMAPROC302A Operate reactors and reaction equipment.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply and explain
- principles of operation
- principles of basic control systems
- physics of operation
- chemistry of operation
and also the ability to
- distinguish between:
  - chemical,
  - instrument,
  - equipment (electrical/mechanical),
  - maintenance cause of problem
- isolate problem to item of equipment
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 unit or area of operation. Individual enterprises may require additional underpinning knowledge depending on the complexity of the system, eg, advanced control systems.
Assessment Method, Context and Resource Implications:

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
Overlay competency:

Organise Work Operations (TDT A17A)

Original Unit Details
Source:
Transport and Distribution Industry Standards (TDT)

Number:
Unit A17

Title:
Product knowledge applied to organise work operations

Unit Descriptor:
This unit is applied to employees who are required to organise the work of others in relation to product identification for (re)ordering receiving, storage, despatch and transport schedules.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables:
Within the process manufacturing industry (chemical, hydrocarbons and oil refining sectors), this unit applies to both warehousing/store and process jobs. Its application may be expanded beyond only organising transport schedules.

Evidence Guide
Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
This unit of competence may be assessed in conjunction with other units that for part of a job role or function.

As this is a 300 series competency, it has a prerequisite of at least two, series 200, Process competencies.

Essential Knowledge and Skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit.

Key Competencies:
These are identical to the original unit.
## UNIT TITLE:

*Undertake Tank-Farming Operations (PMA PROC 307 A)*

## UNIT DESCRIPTOR:

This competency covers the operation of tank farms. It covers the storage and bulk transfer of chemicals and hydrocarbon products including raw materials.

## ELEMENT PERFORMANCE CRITERIA

### ELEMENT 1. Prepare storage facilities

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Recognise the storage types, products, hazards and locations for the tank farm</td>
</tr>
<tr>
<td>1.2 Monitor and inspect storage for product or vapour leakages, and that storage integrity, capacities and condition, are maintained within agreed parameters</td>
</tr>
<tr>
<td>1.3 Check fire protection, purging and deluge systems to verify operational condition and status, and corrective actions to rectify any identified equipment failures</td>
</tr>
<tr>
<td>1.4 Conduct general housekeeping of storage and tank farms, to remove any foreign matter or hazards</td>
</tr>
<tr>
<td>1.5 Record and communicate any maintenance requirements identified</td>
</tr>
</tbody>
</table>

### ELEMENT 2. Monitor storage facilities

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirm tank mixes, capacities and quality, and determine if these are being maintained within the agreed product requirements prior to transfer</td>
</tr>
<tr>
<td>Monitor gas detection systems, to ensure that the storage area is maintained safely and in a gas free environment</td>
</tr>
<tr>
<td>Inform appropriate personnel of the storage, operational and status conditions of the storage facilities</td>
</tr>
</tbody>
</table>

### ELEMENT 3. Conduct product loadout

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liaise with control operations prior to product loadout, to ensure that all start-up permissives have been satisfied and product is ready for transfer</td>
</tr>
<tr>
<td>Monitor and adjust loadout pumps to meet agreed loading capacities and product flow rates.</td>
</tr>
<tr>
<td>Monitor loadout pumps to ensure operation is within stated operational requirements and without excessive vibration</td>
</tr>
<tr>
<td>Take and record product shipping samples during loadout for quality monitoring</td>
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### ELEMENT 4. Clean tanks/vessels

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<tr>
<td>Identify cleaning requirements</td>
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<td>Clean to requirements according to standard procedure</td>
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### ELEMENT 5. Carry out maintenance procedures

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<td>Isolate tank farm equipment and prepare for vessel entry or maintenance as required</td>
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<tr>
<td>Complete minor maintenance according to standard procedures</td>
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<tr>
<td>Receive plant back from maintenance</td>
</tr>
<tr>
<td>Prepare plant for the introduction of chemicals/hydrocarbons and operation</td>
</tr>
</tbody>
</table>
**RANGE OF VARIABLES:**

**Context:**
This competency is typically performed by all operators.

This competency includes items of equipment such as:
- 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, LPG, LNG, naphtha)
- chemicals (raw materials and products).

Typical problems include:
- seal/gasket leaks
- product quality issues
- safety equipment readiness
- liaison with other areas
- tank capacities and space.

All operations are performed in accordance with standard operating procedures.

**OH&S:**
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the storage equipment, sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of storage equipment.

Thorough knowledge of enterprise standard operating procedures is required.

**Assessment Focus:**
Assessment should establish the ability to start-up and shut down transfers correctly and also the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

---

**EVIDENCE GUIDE:**

**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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

Competence must be demonstrated in the operation of all ancillary equipment to the level required for this competency unit.
Concurrent Assessment and Prerequisites:
There are no prerequisites.

For many enterprises it will be appropriate to assess this unit in conjunction with:
- PMAPROC201A  Operate fluid flow equipment
- PMAPROC204A  Use utilities and services
- PMACOM200A  Process and record information
- PMAHYD201A  Operate and monitor prime movers
- PMAHYD314A  Operate and monitor compressor systems and equipment
- PMAHYD203A  Operate and monitor valve systems
- PMAHYD205A  Enter confined space.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply and explain
- Principles of operation
- physics of operation
- corrective action appropriate to the problem cause
- confined space entry and vessel entry requirements and procedures
- testing techniques
- equipment isolation and purging
- use and operation of safety equipment, including breathing apparatus
- tank and product mixing
- flow rates and measures
- tank capacities and percentages
- static electricity principles
- mechanical principles
and also the ability to distinguish between types and causes of storage management problems
as is relevant to the practical operation of equipment at that job level.
Assessment Method, Context and Resource Implications:

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Optimise Operating Systems (PMA PROC 400 A)

UNIT DESCRIPTOR:
This competency covers the optimisation of a complete production area which includes the safe and efficient operation of process, plant and equipment to fully meet operational needs and ensure the production of finished goods is made to customer requirements.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Monitor process, plant and equipment performance | 1.1 Identify optimum process, plant and equipment performance against actual performance utilising historical data/records  
1.2 Identify issues that are likely to impact on plant performance, product quality and uniformity  
1.3 Identify possible causes for variations in process, plant and equipment performance against optimum indicators based on experience and the use of analytical techniques |
| 2. Determine corrective action | 2.1 Determine corrective action to remove the problem and possible future causes  
2.2 Predict impact of a change in one unit/area on other related plant units/areas  
2.3 Develop measurable objectives and evaluate alternatives  
2.4 Decide corrective action and communicate to relevant personnel |
| 3 Co-Ordinate corrective action to optimise process, plant and equipment performance | 3.1 Co-ordinate with all unit areas and operations in order to rectify problem/future causes in process, plant and equipment performance  
3.2 Implement and/or initiate all required corrective actions, the outcomes of these actions communicated to all affected areas  
3.3 Maintain and log all required information for further action so as to provide a historical record of all events |
| 4. Recommend continual improvement strategies | 4.1 Develop recommendations for continual improvement of process, plant and equipment effectiveness  
4.2 Prepare report on recommendations  
4.3 Present recommendations to appropriate personnel  
4.4 Follow up recommendations |
RANGE OF VARIABLES:

Context:
This competency unit includes all such items of equipment and unit operations which form part of the production process of a complete area.

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process, plant capacity and product quality in order to recognise inefficiencies in process, plant and equipment and recommend methods of optimisation and process improvement.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to determining the corrective action and the provision of recommendations.

Thorough knowledge of enterprise standard operating procedures is required. Appreciation of the plant’s business goals and key performance indicators is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out the corrective action efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Context of Assessment:
This competency is performed by experienced operators, who may be working individually or in a team environment. The competency unit applies to a wide range of processes and equipment.

Critical Aspects:
It is essential that the optimum parameters for process, plant and equipment capacities are understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to optimise the operation of process, plant and equipment and recommend process improvement strategies to fully meet operational needs and ensure the production of finished goods is made to customer requirements.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- problems are recognised and defined;
- possible causes are identified based on experience and the use of analytical techniques in solving the problem, including identifying variations and cause, separating single problems from multiple problems and the recognition of recurring problems;
- fundamental cause of process or equipment faults is determined and
- corrective/preventative actions are developed to avoid recurrence of the problem and optimise the condition of the process, plant and equipment.
- product quality and uniformity are maintained.

Concurrent Assessment and Prerequisites:
This unit has the prerequisite competencies of the level 3 process competencies relevant to the process being operated at AQF 3. In addition, the following technical electives:

- PMAQUAL100A Contribute to quality in the organisation
- PMAQUAL300A Initiate continuous improvement.

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:
Competence to include the ability to apply and explain
- principles of operation
- physics of operation
- chemistry of operation
- isolate problem to item of equipment
and also the ability to distinguish between:
- chemical
- instrument
- equipment (electrical/mechanical)
- maintenance cause of problem
as is relevant to the ability to problem solve and recommend strategies for optimisation of production processes at that level.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by project, and/or a range of case studies/scenarios and/or by demonstration (pilot) plant exercise. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
# UNIT TITLE:

**Trial New Process/Product (PMA PROC 401 A)**

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## UNIT DESCRIPTOR:

This competency covers the participation in the plant trials of new or significantly changed processes and/or products.

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## PERFORMANCE CRITERIA

Demonstrates the ability to:

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<tr>
<th>ELEMENT</th>
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</table>
| 1. Contribute to the selection of equipment/process conditions | 1. Liaise with appropriate technical expert(s)  
| | 1.2 Interpret properties of materials and desired product characteristics  
| | 1.3 Interpret technical specifications/drawings of plant requirements  
| | 1.4 Recommend equipment/ancillary equipment appropriate for the materials, products and conditions  
| | 1.5 Recommend process conditions appropriate for the equipment, materials and product characteristics  
| | 1.6 Recommend feed rates/order/condition appropriate to the process conditions, equipment, materials and product characteristics  
| | 1.7 Ensure recommendations meets the identified need |
| 2. Participate in hazard and operability studies | 2.1 Identify process conditions and apply to hazard and operability studies  
| | 2.2 Undertake investigations following hazard studies  
| | 2.3 Record and report findings |
| 3. Prepare for trials | 3.1 Determine the availability of resources required such as materials, equipment, people and skills  
| | 3.2 Estimate time required for trial  
| | 3.3 Liaise with relevant stakeholders  
| | 3.4 Schedule trial at a convenient time  
| | 3.5 Develop documentation for the trial  
| | 3.6 Determine clearance requirements, special safety and storage requirements  
| | 3.7 Verify decisions with appropriate expert/stakeholder  
| | 3.8 Ensure people with adequate skills are available for the trial |
| 4. Conduct test runs/trials | 4.1 Conduct trials/test runs  
| | 4.2 Maintain communication with all relevant people  
| | 4.3 Closely monitor critical parameters  
| | 4.4 Make adjustments to process conditions as required during trial  
| | 4.5 Sample and test product as required  
| | 4.6 Record and report performance data  
| | 4.7 Plant left in a condition suitable for routine production to recommence |
5 Evaluate results and identify modifications

| 5.1. Interpret data from trial |
| 5.2. Identify factors which might be related to low rates/low charge amounts |
| 5.3. Recommend modifications and improvements required |
| 5.4. Develop and check standard operating procedure |
| 5.5. Complete documentation and report to appropriate personnel |
| 5.6. Ensure all relevant staff have required skill levels for the introduction of the new process |

**RANGE OF VARIABLES:**

**Context:**
This competency is typically performed by experienced operators, likely to be the most technically competent members of an operational team, usually working in conjunction with a process/product development expert such as a chemist or engineer.

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 on a full scale plant.

This competency unit includes the functions of:
- liaison with manufacturers, chemists, engineering personnel, designers, maintenance personnel and potential customers where appropriate
- participation in hazard studies, which may include:
  - hazard and operability studies (HAZOP)
  - hazard analysis studies (HAZAN)
- solving operational problems
- disposal of waste generated in the trial.
- making suggestions for process changes to assist the implementation of the new process/product.

All operations are performed in accordance with standard procedures.

**OH&S:**
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the equipment operation and process/product trialing/development practices, sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the trialing practices.

Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:
Assessment should establish the ability to recognise normal equipment operation correctly and also the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of process in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.
Concurrent Assessment and Prerequisites:
This unit has a prerequisite of process competencies relevant to the process being operated. Such competencies could include at least two of the following:
- PMAPROC300A Operate a unit of equipment
- PMAPROC301A Operate distillation units
- PMAPROC302A Operate reactors and reaction equipment
- PMAPROC303A Operate cracking furnaces
- PMAPROC304A Operate compressors
- PMAPROC305A Operate process control systems
- PMAPROC307A Undertake tank farming operations.

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

and also the ability to distinguish between the following problem sources, and their avoidance:
- chemical
- instrument
- equipment (electrical/mechanical)
- maintenance

as is relevant to the practical operation of equipment at that job level.

Assessment Method, Context and Resource Implications:
It is likely that candidates will have already demonstrated competence in many areas of plant operations under a wide range of operating conditions. Trialing may be a relatively frequent experience in some plants and be rare or non-existent on other plants.

Competence may be assessed partially on existing plant, similar plants, trials, or simulations, or by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
Manufacturing Learning Australia

‘Hydrocarbons’
Competency Standards

for the

Chemical, Hydrocarbons And Oil Refining Industries

Training Package code: PMA98
August 1998
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UNIT TITLE:
Operate & Monitor Production/Processing Equipment (PMA HYD 200 A)

UNIT DESCRIPTOR:
This competency covers the activities and functions, excluding control operations, of operators within the production/process environment.

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<td>1. Monitor equipment operation</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Monitor and observe equipment operating condition, pressures and temperatures</td>
<td></td>
</tr>
<tr>
<td>1.2 Recognise observations which differ from normal operating parameters and requirements</td>
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</tr>
<tr>
<td>1.3 Take appropriate action to maintain correct operating parameters</td>
<td></td>
</tr>
<tr>
<td>1.4 Identify faults and initiate repair or report as required</td>
<td></td>
</tr>
<tr>
<td>2. Prepare equipment for maintenance</td>
<td></td>
</tr>
<tr>
<td>2.1 Isolate equipment identified for maintenance ensuring that equipment is drained, depressurised and made safe</td>
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<tr>
<td>2.2 Confirm equipment status by conducting appropriate gas sampling or testing</td>
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<tr>
<td>2.3 Apply all stated requirements within the permit to work system to the maintenance activity</td>
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<tr>
<td>3. Prepare equipment for operational use</td>
<td></td>
</tr>
<tr>
<td>3.1 Bring equipment back to a stand-by status prior to start up process commencing</td>
<td></td>
</tr>
<tr>
<td>3.2 Confirm the operational status of the equipment, and equipment is started up to bring the equipment on line</td>
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<tr>
<td>4. Start up production equipment</td>
<td></td>
</tr>
<tr>
<td>4.1 Check and satisfy all permit requirements before equipment is brought back on line</td>
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</tr>
<tr>
<td>4.2 Monitor and report equipment performance to control operations</td>
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</tr>
<tr>
<td>4.3 Complete logs recording the details of the work conducted to provide a historical record of the equipment's operation</td>
<td></td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
This competence is to be demonstrated in relation to a variety of process equipment which may include:

- heaters, furnaces and heat exchangers
- pumps
- power generation; turbines, engines and compressors
- columns
- towers
- vessels, tanks
- piping systems
- valves and flanges
- sumps and drains
- fire and gas detection equipment.

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

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S 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.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.
Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:

Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency should be assessed within the working environment across a range of equipment, conditions and operational requirements.

Persons undertaking this competency must be able to demonstrate an ability to work largely unsupervised, as well as to troubleshoot and diagnose operational faults and suggest what actions should be taken to rectify the identified problem. Also, they must be able to demonstrate a capacity to work with and communicate with other work groups and personnel within the production process.

It is expected that a person undertaking this competency would possess a sound mechanical background or ability in order to utilise and manipulate a range of hand tools and equipment efficiently and safely.

The application of appropriate process knowledge relating to the type of product being produced is essential in underpinning this competency. This knowledge should be readily applied to the specific units this person may have responsibility for.

Concurrent Assessment and Prerequisites:
Nil.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Demonstration of competence in this unit must include knowledge of:
- physics relating to the process
- chemistry relating to the process
- process equipment operating parameters
- process and product variables and reactions including water, gas, oil, glycol and sulphates
- hydrate formation.
Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:
*Operate And Monitor Prime Movers (PMA HYD 201 A)*

UNIT DESCRIPTOR:
This competency covers the operation, monitoring and control of varying types of prime movers.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Prepare equipment for operation | 1.1 Check operation and function of prime movers by applying principles of operation and standard procedures
1.2 Check the operational area to ensure that any potential hazards which may affect the operation of the equipment are removed |
| 2. Start up prime movers | 2.1 Conduct required safety checks and pre-starts to determine or verify the operational condition parameters of the equipment
2.2 Engage prime mover protection devices prior to the start-up of equipment
2.3 Achieve operational flows and temperatures before bringing the system on line for use |
| 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 Monitor 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 |
RANGE OF VARIABLES:

Context:
Prime mover systems may include:
- fuel and carburation
- ignition
- lubrication
- induction and exhaust
- governing
- power supply
- safety and shutdown systems
- cooling.

Prime mover may include:
- reciprocating engines
- diesel, gas and petrol
- turbine engines
- electric motors.

Speed ranges:
- low - up to 500 rpm
- medium - 500 to 1500 rpm
- high - over 1500 rpm.

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Appropriate hand tools, equipment and testing and sampling equipment are utilised.

Work may be undertaken in either a team or individual environment.

Manufacturer's instructions or operating manuals apply.

required and then the ability to carry that action out efficiently to completion.
Enterprise or site specific maintenance schedules, including daily, minor and major checks and services, must be complied with.

Relevant legislative and enterprise or site specific OH&S and safety requirements must be adhered to.
Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency can be assessed in either a workplace or simulated environment, and can be applied to a range of prime movers, operational speed ranges, mechanical cycles and fuel types. It also expected that a person be able to demonstrate the use and operation of a selection of hand tools, equipment and testing and sampling devices and techniques.

Persons undertaking this competency would do so as a normal part of their work duties and responsibilities, and would normally not be considered as specialist repairers or maintainers of production and process equipment.

The person undertaking this competency would be expected to demonstrate an ability to work with limited supervision or direction.

Concurrent Assessment and Prerequisites:
Nil

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:
Demonstration of competence in this unit must include knowledge of:
- plant operating parameters and capacities
- plant operating principles including fuel injection, lubrication, cooling, ignition, induction and exhaust power supply
- component operation including flows, temperatures and speeds
- equipment terminology
- sampling and testing techniques
- technical drawing
- safety systems.

Assessment Method, Context and Resource Implications:
Competence in this should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Prepare equipment for operation | **1.1** Check operation of pumping equipment and systems by applying knowledge of pump classifications and required flow rates  
**1.2** Conduct pre-start-up checks upon the required power plant or prime mover to ensure that all nominated operational valves are correctly sequenced before commencing pumping operations, and that all safety requirements are met  
**1.3** Monitor pumping installations/equipment to determine if the correct pump pressures and flows conform to their required application |
| 2. Monitor and assess pumping systems and equipment | **2.1** 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  
**2.2** Monitor and regularly check pumping systems/equipment performances and all components to identify any signs of excessive wear and diminution of performance  
**2.3** Check operational valves and valve assemblies for possible leakages  
**2.4** Monitor and identify variations in the operating conditions of the pumping systems/equipment through the interpretation of amperage operating data and equipment  
**2.5** Adjust pump speeds and flow rates to meet changing or altered flow capacities in the product being produced |
| 3. Conduct preventative maintenance | **3.1** 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  
**3.2** 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  
**3.3** Use personal protective clothing and equipment required to undertake the maintenance prescribed by the site or enterprise specific safety and OH&S requirements |
RANGE OF VARIABLES:

Context:
- Pumping systems and equipment may include:
  - beam pumps
  - electrical submersible pumps
  - jet pumps
  - centrifugal pumps
  - reciprocating pumps
  - diaphragm pumps.

Hand tools and specific related equipment.
Work may be undertaken in either a team or individual context.
Enterprise specific maintenance or servicing schedules or requirements apply.
Relevant legislative and safety requirements and procedures must be adhered to.
All operations are performed in accordance with standard operating procedures.
All work is undertaken within the stated requirements of the permit to work system.

OH&S:
- All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
- Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
- Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
- This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:

It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This unit may be assessed either in the workplace or within a simulated environment, and can be applied to a range of pumping systems and equipment, operational conditions and requirements and associated production/process equipment.

Persons undertaking this competency would do so as a normal part of their work duties and responsibilities, and would not normally be considered to be specialist repairers or maintainers of production/process equipment or systems. This competency would normally be undertaken within the context of limited supervision or direction.

Concurrent Assessment and Prerequisites:

This unit should be assessed concurrently with or following assessment in:

- Operate and monitor prime movers
- Operate and monitor valve systems
- Operate, monitor and maintain pipeline facilities and equipment.
- Undertake storage, loading and transfer of product.
- Monitor and maintain compression systems and equipment.
- Monitor and maintain electrical systems.
- Monitor and maintain instrument and control systems.

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following
- pumping system/equipment operating parameters
- sampling and testing techniques
- equipment terminology
- plant or field layout or geography
- technical drawings
- safety systems and procedures.
- fault finding and troubleshooting techniques.
- job hazard analysis.

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.

A demonstrated mechanical background or understanding is highly desirable by the person undertaking this unit of competency in order to allow them to undertake the required level of operation and troubleshooting and operational maintenance.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.

This competency should be assessed within the context of the work environment utilising a range of equipment, safety clothing, conditions and permit applications and or types.
### UNIT TITLE:

**Operate And Monitor Valve Systems (PMA HYD 203 A)**

### UNIT DESCRIPTOR:

This competency covers the operation and monitoring of valves and valve systems.

### ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
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</table>
| 1. Prepare valves for operation | Demonstrates the ability to:  
1.1 Check operation and control of valves and valve systems by applying knowledge of valve operation and fundamental operational principles, ratings and pressures  
1.2 Select and verify valves required for operation against the site specific operating pressures, temperatures, volume, velocities and materials requirements  
1.3 Prepare or sequence valves required for operation ensuring that they are either closed or opened as required, to regulate the flow of liquids and systems flow rates from one vessel to another in a safe and efficient manner  
1.4 Check the valve's operational integrity to ensure that all valve seals are correctly positioned and fitted in order to minimise the risk of valve leakages and failures |
| 2. Operate valve systems |  
2.1 Monitor valve flow characteristics to ensure they function correctly, including at high temperatures.  
2.2 Alleviate valve blockages through the manipulation of the valve type through the relief of pressures and liquid volumes  
2.3 Regulate or alter valve sequences to control the flow rates of fluid during the process to meet changing production conditions and demands  
2.4 Monitor valve seal and disc erosion to prevent valve failure or fatigue |
| 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 assemblies to prevent product leakages  
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 |
RANGE OF VARIABLES:

Context:
Valve types and systems may include:
- non-control valves
- control and shut-off valves
- control valves
- non-return or check valves
- pressure relief valves
- automatic control valves.

Specific valve types can include:
- globe - non-return
- needle - diaphragm (weir, straight through)
- gate - PSV pressure relief
- butterfly - pneumatic globe
- plug cock - pneumatic butterfly
- wedge plug - fail safe modes
- ball cock.

All operations are performed in accordance with standard operating procedures.

Operational maintenance will vary according to valve type, but may include:
- use of sealants and lubricants
- stopping or reducing leaks
- tightening of nuts, valve casings and fasteners
- isolating and gas freeing.

Valves utilised are manufactured to specifications set and governed by the American Institute of Petroleum.

Work may be conducted either within a team related work structure or individually.

State, Federal and local or site specific environmental and historical preservation legislative requirements are to be applied and met. Relevant enterprise specific safety procedures and requirements are also to be applied.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:

It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency should be assessed within the working environment and across a range of valve types/systems, conditions and operational requirements.

Persons undertaking this competency must be able to demonstrate an ability to work largely unsupervised, and to troubleshoot and diagnose operational faults and suggest what actions should be taken to rectify the identified problem. They must also be able to demonstrate a capacity to work and communicate with other work groups and personnel within the production/process environment.

Concurrent Assessment and Prerequisites:
Nil
Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following

- physics related to the process.
- process equipment operating parameters
- process and product variables and reactions, including water, gas, oil, glycol and sulphates
- operating pressures
- operating temperatures
- flow volume
- flow velocity
- fluid corrosive properties
- fluid erosive properties
- fluid volatility
- fluid viscosity
- functions of valve control and isolation.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

**Operate And Monitor Process Support Systems**  
(PMA HYD 204 A)

## UNIT DESCRIPTOR:
This competency covers the operation and management of a series of specified process support systems and equipment, excluding water and fire systems.

## ELEMENT | PERFORMANCE CRITERIA
--- | ---
1. Monitor flare systems  | Demonstrates the ability to:
1.1 | Use the flare pilot and purge system to light and/or relight the flare system
1.2 | Purge flare gas streams to prevent the opportunity for, or likelihood of, an explosive mixture occurring in the flare system
1.3 | Regulate flare header gas supply and condition to ensure that supply pressures are maintained
1.4 | Capture, drain and eliminate hydrocarbons liquids to prevent flare stack damage
1.5 | Monitor flare flame height and/or gas flows to determine and prevent potential product losses and environmental discharges

2. Manage plant instrument air systems  | 2.1 Determine the required levels of demand for instrument air from a knowledge of the plant/site's process control systems or equipment
2.2 | Engage required process equipment and systems, including compressors, driers, receivers and distribution systems, to meet and maintain the plant/site's instrument air requirements
2.3 | Manipulate and adjust flow and control valves to correct the rate and flow of the instrument into the plant/site's process systems and equipment
2.4 | Protect plant/site integrity through the monitoring of the plant's protection and safety systems, to ensure the plant is kept safe and limit any potential damage to process equipment and systems

3. Manage nitrogen systems  | 3.1 Manufacture the required nitrogen (rate and condition) for the plant/site from a knowledge of the plant/site's process control and distribution systems, equipment and storage locations; and mediums
3.2 | Collect nitrogen from appropriate source
3.3 | Compress nitrogen, ensuring routine readings are conducted to check and verify the progress and quality of the nitrogen being compressed
3.4 | Distribute nitrogen around the plant/site in order to be utilised as an inerting medium for plant maintenance purposes
**RANGE OF VARIABLES:**

**Context:**

This unit can be applied to either a plant, satellite or rig installation or site.

Sources of nitrogen may include:

- cryogenic plants
- diaphragm/membrane plants
- liquid storage plants etc

The person undertaking this competency would be expected to work in either a team or individual context.

Relevant legislative and site specific safety requirements, must be adhered to.

Flare systems and equipment may include, high pressure and low pressure flares.

Process support equipment may include:

- compressors
- turbo expanders
- pumps
- prime movers
- vessels and columns.

The permit to work system must be adhered to.

The application of all stated emergency and safety systems is required.

All operations are performed in accordance with standard operating procedures.

**OH&S:**

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.
## Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

## Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

## EVIDENCE GUIDE:
### Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency should be assessed in the work environment utilising a variety of process control mechanisms, equipment, contexts and situations. It is expected, however, that a person undertaking this competency would possess a knowledge of the site specific operating requirements, equipment and control mechanisms.

It would be expected that persons undertaking this competency would be able to demonstrate an ability to organise and plan their own specific work requirements and needs, and to work within a situation of minimal supervision or control.

An understanding of how to communicate the stated requirements within this competency to a variety of areas, both internal and external to the production/process environment, and the choice of the most appropriate medium/s through which to conduct this communication, are also considered necessary.

## Concurrent Assessment and Prerequisites:
Nil

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following

- relative humidity
- dew points
- refrigeration
- basic industry physics
- equipment knowledge
- emergency back up systems
- process control mechanisms and instrumentation
- valves
- high pressure and low pressure systems
- plant integrity.

An ability to interpret, analyse and correlate data from each of the utility operational support areas is an essential skill required to underpin this competency. This would constitute the measurement of flows, pressures and temperatures of the product or products being produced or vented.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

Enter Confined Space (PMA HYD 205 A)

**UNIT DESCRIPTOR:**
This competency covers the control of entry to confined spaces in prior to maintenance or servicing of vessels.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</thead>
<tbody>
<tr>
<td>1. Prepare vessel for entry</td>
<td>1.1 Confirm and verify the purpose of the required entry into the vessel or column, ensuring the required permit to work has been issued to undertake the defined service or maintenance&lt;br&gt;1.2 Ensure equipment is safely isolated prior to entry, has been depressurised, drained and gas freed before commencing any preparatory work on the vessel or column&lt;br&gt;1.3 Prepare equipment before entry, to comply with confined space entry permit requirements&lt;br&gt;1.4 Direct excess exhaust gases into a safe area to present no further hazard to persons or equipment during the defined maintenance period</td>
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<tr>
<td>2. Select safety equipment and clothing</td>
<td>2.1 Select and fit required apparatus as defined in the confined space entry permit requirements&lt;br&gt;2.2 Select and wear designated safety clothing as defined in the confined space entry permit requirements&lt;br&gt;2.3 Attach lifelines or harnesses as defined in the confined space entry permit requirements&lt;br&gt;2.4 Select appropriate instruments for ongoing monitoring of the vessel</td>
</tr>
<tr>
<td>3. Control vessel entry</td>
<td>3.1 Ensure designated work complies with confined space hazard control requirements and rescue procedures and permit requirements met&lt;br&gt;3.2 Complete confined space entry logs, ensuring that all movements of the person working within the confined space are accurately recorded&lt;br&gt;3.3 Maintain communications with control room operations and vessel watcher to provide an update of the work being undertaken and expected timeframes</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:

Maintenance may include:
- steam cleaning
- hydrojetting
- abrasive blasting
- painting
- general cleaning
- repair
- inspection

Columns and vessels may include:
- absorbers
- regenerators
- scrubbers
- solution storage and mixing tanks
- columns and towers
- separators
- tanks
- boilers
- furnaces

Safety equipment may include:
- respiratory protective devices
- safety belts, harnesses and lines
- safety footwear
- coveralls
- torches
- hearing protection
- portable gas detectors.

All operations are performed in accordance with standard operating procedures.

OH&S:

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Updating Information:

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
## Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

## Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

## EVIDENCE GUIDE:
### Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

The person undertaking this competency must be able to demonstrate an ability to work both within a confined space and in an elevated location. The normal work environment the individual may encounter will range from one of no risk to possible risk to definite risk. Therefore, the person undertaking this competency must be aware and demonstrate a knowledge and application of the site/enterprise's risk assessment guidelines.

A person undertaking this competency will be required to undertake a range of inspection and maintenance requirements. Therefore, a competency of specific equipment handling will be required by the individual to underpin this unit.

Given that the nature of this working environment is considered to be hazardous, it is expected that the person undertaking this competency would be able to demonstrate due care and safe working practices whilst operating in this environment.

A demonstrated knowledge of first aid techniques including CPR is essential in underpinning this competency.

It would be expected that the person undertaking this competency would be able to demonstrate the use and application of the approved breathing apparatus supplied by the enterprise.
Concurrent Assessment and Prerequisites:
Nil

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following:
- the site/enterprise's specific rescue requirements
- the permit to work system and the limitations and specifications of the issued permit
- the types and degree of physical stresses and how to react to these (this is essential); these may include
  - electromagnetic radiation
  - ionising radiation
  - noise
  - dust and fragments encountered while cleaning.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Monitor Water And Fire Water Systems*  *(PMA HYD 206 A)*

**UNIT DESCRIPTOR:**
This competency covers the production and distribution of water for drinking purposes and to fire control management.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| **1. Produce potable water** | 1.1 Produce potable water in a manner suited to the plant/site's water supply, filtration and distribution systems  
1.2 Monitor plant/site water pressures and supplies to ensure that a continuous flow of quality potable water is made available to meet the plant/site's operational requirements and services  
1.3 Routinely sample water systems in order to determine the chemical balance and quality of the produced water, and determine what remedial action should be undertaken to correct any identified imbalances  
1.4 Identify water quality deficiencies or imbalances and restore stated water quality requirements and conditions by adjusting chemical dosing  
1.5 Distribute potable water to required locations or stations for future use, ensuring that the supply is both continuous and uninterrupted |
| **2. Manage fire water systems** | 2.1 Check fire main systems and associated operational equipment to ensure that all systems and equipment are correctly engaged and lined up in order to adequately protect the plant or site  
2.2 Check and operate deluge systems, including hydrants and monitors to ensure that their operational condition assures their capacity to isolate affected areas  
2.3 Adequately maintain and evaluate water tank levels to ensure that sufficient stocks or reserves of available fire water are guaranteed to the site/plant in the event of an emergency or fire  
2.4 Management the fire water system, and accurately calculate the site/plant's fire rundown time from a knowledge of fire pump capacities and tank volumes  
2.5 Maintain operational records concerning the function and operation of the fire water systems ensuring that all actions undertaken are recorded and stored for future evaluation of the systems' performance |
### RANGE OF VARIABLES:

#### Context:

Uses for potable water may include:
- drinking purposes
- hot water systems
- toilet facilities
- showers
- emergency wash facilities
- laboratory use.

Fire water systems may include:
- fire main systems
- deluge systems
- fire pumps
- fire water tanks
- fire retardants.

All operations are performed in accordance with standard operating procedures.

This unit can be applied to either a plant, satellite or rig installation or site.

The person undertaking this would be expected to be able to work in either a team or individual context.

Relevant legislative and site specific safety requirements, must be met.

#### OH&S:

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

#### Knowledge and Enterprise Requirements:

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.
Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

It would be expected that persons undertaking this unit of competency would be able to demonstrate the operation of pumps and pumping systems within the context of the plant or site. It would also be considered necessary for persons undertaking this competency to be able to demonstrate that they possess the competencies required to operate within a control room environment, and to be able to work both within a team or individual context.

It is essential that a person undertaking this competency be able to demonstrate knowledge of the site/plant's emergency/fire response procedures and requirements.

Concurrent Assessment and Prerequisites:
Nil

Individual enterprises may choose to add other prerequisites relevant to their process.
### Essential Knowledge:

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

- process control techniques and theories
- fire protection strategies
- process equipment operation
- isolation techniques
- permit to work system
- emergency procedures
- plant/site geography
- systems operating parameters.

Potable water production techniques include:

- chemical handling techniques
- water testing techniques
- water quality management and measurement requirements
- plant/site water supply sources
- plant/site water supply needs, including required volumes
- filtration
- systems
- distribution systems.

Site/plant's emergency systems, distribution systems and locations, and water storage locations and capacities.

### Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Undertake First Response To Fire Incidents (PMA HYD 207 A)

UNIT DESCRIPTOR:
This unit of competency is designed to ensure that an appropriate first response to fire incidents in onshore and offshore situations/emergencies is achieved.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</table>
| 1 Identify fire emergency and raise alarm | 1.1 Evaluate and communicate the location, nature and extent of the fire emergency in a timely and appropriate manner  
1.2 Determine first response requirements in order to evaluate the need to attack the fire emergencies or evacuate the affected areas |
| 2 Initiate basic fire responses | 2.1 Select appropriate extinguishing agents from a knowledge of fire and fuel types  
2.2 Operate basic fighting equipment safely in order to contain the fire emergency |
| 3 Undertake safe evacuation | 3.1 Evacuate area in a safe and controlled manner when first response has failed to control the fire emergency, or has proven inappropriate  
3.2 Immediate area of the emergency is secured to ensure no further loss occurs to people, equipment, process and environment |
**RANGE OF VARIABLES:**
This unit could be applied to any of the following installation or facilities:
- onshore/offshore rig/installation
- island based facility
- floating production platform
- onshore production, processing pipeline systems and/or storage facilities.
- pipeline easements
- maintenance bases.

Equipment may include:
- hand held extinguishers
- hose reels
- fire blankets
- smoke or self rescue respirators
- mobile and portable equipment
- first aid equipment
- pipeline repair clamps
- lamb air movers
- barricades and signage
- communications equipment: ie, two way radios, mobile and sat phones and pagers.

This competency may be addressed through facility induction programs. An ability to work alone is required.

**OH&S:**
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Wherever there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is appropriate to operating guidelines is required.

Knowledge of all OH&S and environmental requirements is required along with an ability to implement them in a relevant manner.

Thorough knowledge of enterprise standard procedures is required.
**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**EVIDENCE GUIDE:**

**Context:**
This competency would be applied by those persons working or operating within an onshore or offshore installation or facility. The demonstration of this competency would be required by those persons who regularly travel to any of these facilities.

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is appropriate with operating guidelines is required.

**Critical Aspects:**
Competence must be demonstrated through the knowledge and application of a range of technologies including:

- first response to fire fighting equipment and media
- first response to fire control and attack techniques and strategies
- self rescue techniques.
- Basic liaison with third parties
- Administering of first aid
- Site securement techniques
- pipeline isolation procedures.

**Essential Knowledge:**
A person undertaking this competency must be able to demonstrate a knowledge of

- site specific alarm procedures
- characteristics of fire and fuel types
- composition and uses of extinguishing agents
- basic fire fighting equipment
- site or enterprise various emergency procedures and response plans
- site specific isolation procedures
- liaison techniques with third parties
- isolate pipeline sectors.
**Essential Skills:**

It would be expected that a person undertaking this unit of competency would be able to demonstrate:

- use of fire fighting equipment
- effective communication with other site personnel and operate within a situation of limited supervision.

**Resource Implications:**

Standard resources and equipment found in the workplace should be used for the demonstration of competence.

**Consistency in Performance:**

This unit of competency should be reassessed on a regular basis.

**Context of Assessment:**

Competency may be assessed both within a simulated context and/or in the workplace using role-plays/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

It would be expected that a person undertaking this unit of competency would be able to demonstrate the use and application of a range of first response fire fighting safety equipment.

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

In all cases it is expected that the practical/simulation assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy of the operator.
# UNIT TITLE:

**Undertake Fire Control And Emergency Rescue (PMA HYD 208 A)**

## UNIT DESCRIPTOR:

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

## ELEMENT | PERFORMANCE CRITERIA
--- | ---
1. **Respond to identified fire emergencies** | 1.1 Communicate the nature and extent of the fire emergency to team members in order to confirm required actions and responses  
1.2 Apply knowledge of fire chemistry, fire characteristics and chemical hazards to assessment of the fire emergency and communicate the action required  
1.3 Advise others of the nature and extent of the fire emergency from a knowledge of appropriate fire control strategies  
2. **Deploy fire emergency equipment** | 2.1 Utilise knowledge of the location and availability of fire fighting equipment in the control of a fire emergency  
2.2 Select and utilise appropriate personal protective clothing and equipment and breathing apparatus by all team members  
2.3 Apply appropriate fire fighting and containment media in a safe and co-ordinated manner to attack and control the fire emergency  
3. **Undertake search of and rescue from affected areas** | 3.1 Confirm the need to conduct the search and rescue is with team leaders or other nominated personnel  
3.2 Minimise the risk of further injury to affected personnel by applying casualty handling techniques  
3.3 Transfer affected personnel are in an appropriate manner to a safe location  
3.4 Communicate extent of injuries and casualty numbers to other support groups and further assistance is requested as required
<table>
<thead>
<tr>
<th><strong>RANGE OF VARIABLES:</strong></th>
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<tbody>
<tr>
<td>This unit could be applied to any of the following installation or facilities:</td>
<td></td>
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<tr>
<td>• onshore/offshore rig/installation</td>
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<tr>
<td>• island based facility</td>
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<tr>
<td>• floating production platform</td>
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<td>• onshore production, processing and/or storage facilities. equipment may include:</td>
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<tr>
<td>• fire extinguishing agents and water curtains</td>
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<tr>
<td>• hoses</td>
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<tr>
<td>• mobile extinguishers</td>
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<tr>
<td>• stretchers</td>
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<tr>
<td>• personal protective equipment</td>
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<tr>
<td>• self contained breathing apparatus (SCBA)</td>
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<td>• communication equipment.</td>
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</tbody>
</table>

This competency may be addressed through facility induction programs.

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<thead>
<tr>
<th><strong>EVIDENCE GUIDE:</strong></th>
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<tr>
<td><strong>Context:</strong></td>
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<tr>
<td>This competency would be applied by those persons who as a normal part of the work responsibilities and duties act as members of an emergency response team on a nominated onshore or offshore facility.</td>
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</tbody>
</table>

The person undertaking this competency must be able to work alone and also within an environment which requires a high level of teamwork and interpersonal communication. A person undertaking this unit of competency should be able to respond to directives given either by emergency team leaders or other team members in order to contain and control the emergency.

<table>
<thead>
<tr>
<th><strong>Critical Aspects:</strong></th>
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<tbody>
<tr>
<td>A person undertaking this competency must be able to demonstrate a knowledge of:</td>
<td></td>
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<tr>
<td>• use and selection of personal protection equipment</td>
<td></td>
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<tr>
<td>• fire control and attack techniques and strategies</td>
<td></td>
</tr>
<tr>
<td>• selection and application of appropriate fire extinguishing media</td>
<td></td>
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<tr>
<td>• characteristics of fires and fuel types</td>
<td></td>
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<tr>
<td>• principles and procedure of SCBA</td>
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<tr>
<td>• self rescue techniques</td>
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<tr>
<td>• relevant facility fire management and safety systems.</td>
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</table>

An ability to work alone and as a member of a team is required.
Concurrent Assessment and Prerequisites:
It would be expected that a person undertaking this competency would have completed or be able to demonstrate competence in the following units of competency before undertaking this unit:
- Unit 27 Respond to fire and smoke incidents (National Process and Production Operators Competency Standards 1995)
- Unit 27a Undertake first response to fire incidents (National Process and Production Operators Competency Standards 1995).

Essential Knowledge:
A person undertaking this competency must be able to demonstrate a knowledge of
- fire chemistry, fire characteristics and chemical hazards
- location and availability of fire fighting equipment
- appropriate personal protective clothing and equipment and breathing apparatus
- appropriate fire fighting and containment media
- casualty handling techniques.

Essential Skills:
It would be expected that a person undertaking this unit of competency would be able to communicate with team members the nature and extent of the fire and the actions required.

Resource Implications:
Standard resources and equipment found in the workplace should be used for the demonstration of competence.

Consistency in Performance:
This unit should be reassessed on a regular basis.

Context of Assessment:
Competency may be demonstrated within a simulated context. It would be expected that a person undertaking this unit of competency would be able to demonstrate the use and application of a range of fire fighting and rescue equipment, protective clothing and equipment and self contained breathing apparatus.

A person undertaking this unit of competency would be able to demonstrate the capacity to participate as an effective part of an emergency response team.
**UNIT TITLE:**

Monitor The Permit To Work  

(PMA HYD 209 A)

**UNIT DESCRIPTOR:**

This competency covers the monitoring of the operational conditions in which a permit to work has been issued, and the required activities and functions associated with the production/process of oil and gas products.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td><strong>1. Monitor permit to work systems</strong></td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Control work activities to comply with the enterprise or site's work permit system and safety procedures</td>
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<tr>
<td>1.2 Verify and confirm the need for the work permit to be issued with those persons requiring to undertake the identified maintenance or repair</td>
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<tr>
<td>1.3 Check and verify the permit holder's knowledge of the issued permit and its requirements before allowing any repair or maintenance work to be undertaken on the production/process equipment</td>
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<tr>
<td>1.4 Ensure that the work to be undertaken is undertaken in sequence and completed in a safe and co-ordinated manner</td>
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<tr>
<td>1.5 Identify potential dangers and hazards and confirm with those undertaking the permitted work and control measures are established</td>
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<tr>
<td><strong>2. Prepare for permitted work</strong></td>
<td>2.1 Maintain safe working conditions and environment by utilising available isolation procedures, safety equipment and emergency procedures</td>
</tr>
<tr>
<td>2.2 Monitor plant conditions and all environmental hazards to ensure their effect is limited or controlled so as not to adversely affect or restrict the work to be undertaken</td>
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<tr>
<td>2.3 Ensure that appropriate safety equipment and clothing is selected and worn during preparation of equipment or systems</td>
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<tr>
<td>2.4 Make safe the equipment/system, ensuring it is safely isolated, depressurised, tagged and locked out before allowing any repair or maintenance work to be undertaken</td>
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<tr>
<td>2.5 Apply all required testing procedures and requirements to verify if the system/equipment has been made safe for work to commence</td>
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</tbody>
</table>
| 3. Monitor permit conditions | 3.1 Monitor permit holder and conditions to ensure that the work being conducted has conformed to the issued permit requirements  
3.2 Communicate changes in the operating conditions or requirements of the permit to permit holders to ensure they are kept aware of any potential dangers or hazards  
3.3 Identify and act upon incidences of non-compliance with permit conditions through the withdrawal or suspension of the issued permit |
|-----------------------------|-------------------------------------------------------------------------------------------------|
| 4. Return equipment/systems to operational condition | 4.1 Check the work conducted against the issued permit to ensure that all the nominated work requirements have been satisfied  
4.2 Check the working area in accordance with the site's safety procedures, to ensure all work is completed prior to equipment de-isolation being conducted  
4.3 Test and check locally, equipment/systems before returning them to operation to ensure they meet normal operational conditions  
4.4 Monitor general housekeeping to ensure that the site has been left in a clean and safe condition  
4.5 Communicate status of the work conducted and the results of the permit to other production/process personnel before returning equipment/system to an on-line condition |
### RANGE OF VARIABLES:

**Context:**

Equipment used in this unit may include:

- danger tags and lockouts
- out of service tags
- blinds
- blind list
- gas testers and monitors
- lights
- ladders
- catholic protection bonds
- barricades.
- signage
- communications equipment
- process and alignment drawings.

Permits may include:

- hot
- cold
- confined entry
- excavation.

Safety equipment may include:

- eye protection
- ear protection
- goggles
- gloves
- clothing
- respirators and masks
- helmets

Legislative and site specific safety procedures and/or requirements, including in hazard identification, assessment and application of control measures, must be met.

This unit may be applied to either an individual or team related context within the workplace.

**OH&S:**

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
This competency should be assessed within the context of the work environment, utilising a range of equipment, safety clothing, conditions and permit applications and/or types. It is expected that a person undertaking this competency would be able to demonstrate a working knowledge of the site or enterprise specific permit requirements, and the permit system or administration procedure.

The ability of a person undertaking this competency to work with or liaise with a variety of work or service groups in order to effect the stipulated requirements listed in the issues permit to work, and to clearly ensure that the conditions of the permit are met, is essential.

Persons undertaking this competency must be able to demonstrate an ability to work under a variety of contexts and, as such, to manage situations in which they normally would work largely unsupervised, and to co-ordinate their workflows and requirements both at the individual and team level.

Concurrent Assessment and Prerequisites:
Nil

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following

- blind lists and P&IDs
- tagging procedures
- isolation procedures
- emergency procedures, including evacuation
- gas types, toxicity and substances
- oxygen levels
- area knowledge
- , including plant and field
- permit types and limitations
- static electricity and cathodic protection
- product tolerances and specifications'
- environmental hazards
- hot work protective measures and confined space entry requirements.
- Columns
- vessels
- fire fighting equipment
- blinds
- pumps
- compressors
- prime movers
- valves.

An understanding of alarm and communication systems is required.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
### UNIT TITLE:

**Undertake Helicopter Safety And Escape (PMA HYD 210 A)**

### UNIT DESCRIPTOR:

This unit of competency is designed to improve the chance of an individual surviving a helicopter incident at sea through the application of general helicopter safety techniques.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</table>
| 1. Prepare for helicopter ditching | Demonstrates the ability to:  
1.1 Facilitate a controlled and safe egress from a ditched helicopter from a knowledge of helicopter layout, including the location and operation of emergency exits and equipment  
1.2 Adopt the required brace position in order to allow for proper positioning prior to ditching  
1.3 Check harnesses, seat belts and life jackets to ensure that they are properly fastened and secured prior to the ditching in order to minimise personal injury or gear failure  
1.4 Secure personal items within the cabin prior to the evacuation to facilitate escape  
1.5 Acknowledge and respond to information communicated by the helicopter crew advising the nature and extent of the situation |
| 2. Undertake evacuation of the helicopter | 2.1 Identify appropriate primary and alternative escape routes in order to determine the locations through which the evacuation will be undertaken  
2.2 Undo, in a controlled, sequential manner seat belts and harnesses to facilitate exit from the helicopter  
2.3 Deploy available safety equipment at the appropriate time in order to assist the individual’s sea survival after evacuation has been safely completed |
RANGE OF VARIABLES:
This unit of competency would be applied to those persons who regularly travel by helicopter to any of the following installations or facilities:
- offshore rig/installation
- island based facility
- floating production vessel.

Equipment used in this unit of competency may include:
- helicopter simulators
- beacons
- life rafts
- distress flares
- life jackets
- EPIRB.

The application of stated emergency procedures and requirements which are relevant to a particular helicopter type or operation is required.

Relevant legislative and safety case agreements and requirements must be adhered to.

An ability to work in a team environment is required.
EVIDENCE GUIDE:
This competency would be applied by those persons working or operating within or on an offshore installation or facility. The demonstration of this competency would be required of those persons who regularly travel to these facilities.

Critical Aspects:
The person undertaking this competency should be able to demonstrate an ability to effectively communicate with fellow personnel, rescue operations and other work groups across a range of issues and needs particular to this unit of competency. In addition to this requirement, the person should be able to operate within a situation of limited supervision and guidance whilst undertaking this competency.

The demonstration of at least one unassisted escape within the following simulated situations is required:
- a controlled ditching on water
- partial submersion of an aircraft
- an aircraft capsize on water.

Persons undertaking this unit of competency must complete a medical questionnaire or provide a certificate of medical fitness in order to demonstrate that they are capable of undertaking the identified practical training without undue risk of injury or illness.

Persons with medical conditions which preclude undertaking the identified practical training may seek exemption.

Demonstration of at least one unassisted inverted escape is required.

Essential Knowledge:
A demonstrated knowledge of the following is required:
- helicopter types and configurations being operated
- escape routes
- inverted and submerged helicopter escape techniques
- life jacket operation
- emergency equipment deployment techniques
- safety and emergency equipment operation
- life raft operation and deployment
- swimming techniques (life jacket)
- rescue and recovery techniques
- hypothermia prevention and reduction techniques (delaying and offsetting).
Resource Implications:
Standard resources and equipment found in the workplace should be used for the demonstration of competence.

Essential Skills:
It would be expected that a person undertaking this unit of competency would be able to demonstrate:

- inverted and submerged helicopter escape techniques
- life jacket operation
- emergency equipment deployment techniques
- safety and emergency equipment operation
- life raft operation and deployment
- swimming techniques (life jacket)
- rescue and recovery techniques.

Consistency in Performance:
The maintenance and retention of the skills and knowledge contained within this unit of competency may be assessed by:

- regular demonstration or proof of this competency as defined within the facility or safety case as appropriate
- revision when new equipment is commissioned.

Context of Assessment:
This unit should be assessed in a simulated environment consistent with aircraft types and seating capacities commonly used by the offshore facilities.

Assessment of the simulation is conducted using resources consistent with those of enterprises or sites.
### UNIT TITLE:

*Apply Sea Survival Techniques (PMA HYD 211 A)*

### UNIT DESCRIPTOR:

This unit of competency is designed to allow persons to improve their chances of survival through the application of agreed sea survival techniques and strategies.

### PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
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</table>
| 1. Prepare for abandonment of the facility or helicopter | 1.1 Make safe evacuation area to ensure likelihood of personal injury or equipment damage is minimised  
1.2 Selection and apply appropriate personal flotation device (life jacket) and other equipment  
1.3 Prepare for evacuation by applying appropriate methods and means of evacuation |
| 2. Abandon the facility or helicopter | 2.1 Deploy safety/rescue equipment in a safe and controlled manner before commencing abandonment  
2.2 Abandon the facility, or helicopter, in accordance with relevant safety requirements and systems  
2.3 Depart promptly from the facility or helicopter using agreed techniques and in a safe and controlled manner  
2.4 Utilise appropriate safe water entry procedures |
| 3. Manage survival process | 3.1 Prepare the life raft for use by applying a knowledge of life raft operation and requirements  
3.2 Check and verify all safety equipment as operational  
3.3 Apply suitable swimming techniques (life jacket) in the water in order to aid movement and boarding of the deployed life raft  
3.4 Rescue and recover persons in the water minimising further potential for injury through the appropriate raft boarding and righting techniques  
3.5 Employ suitable techniques, both in the raft and, in the water in order to delay the onset of hypothermia  
3.6 Identify and act upon potential hazards to minimise injury or damage to personnel |
| 4. Facilitate recovery process | 4.1 Deploy position indicating devices and use appropriate signalling devices to facilitate the location of personnel by air-sea rescue group  
4.2 Use emergency supplies and equipment to ensure that available supplies are maximised and are able to meet the nature and extent of the emergency  
4.3 Apply appropriate helicopter/vessel rescue techniques to the recovery process |
RANGE OF VARIABLES:

This unit could be applied to those persons who regularly travel to any of the following installations or facilities:

- offshore rig/installation
- island based facility
- floating production vessel.

Equipment used in this unit of competency may include:

- scramble net
- life raft deployment devices
- position indicating devices
- ladders
- life rafts
- helicopter lifting strops
- emergency descent devices
- signalling devices rescue harness.

Relevant legislative requirements and safety case management agreements must be adhered to.

An ability to work either within an individual or team environment is required.
EVIDENCE GUIDE:

Context:
This competency could be demonstrated by those persons working or operating within or on an offshore installation or facility. The demonstration of this competency would be required of those persons who regularly travel to any of these facilities.

Critical Aspects:
The person undertaking this competency should be able to demonstrate an ability to effectively communicate with fellow personnel, rescue operations and other work groups regarding a range of issues and needs particular to this unit of competency. In addition to this requirement, the person undertaking this competency should be able to operate within a situation of limited supervision and guidance.

Persons undertaking this unit of competency must complete a medical questionnaire or provide a certificate of medical fitness in order to demonstrate that they are capable of undertaking the identified practical training without undue risk of injury or illness.

Persons with medical conditions which preclude undertaking the identified practical training may seek exemption.

Concurrent Assessment and Prerequisites:
The underlying skills and knowledge required within this competency should be transferable to all other identified areas requiring an emergency response or sea survival in an offshore environment such as:

- helicopter safety and survival
- responding to fire and smoke situations.

Essential Knowledge:
A demonstrated knowledge of the following is required:

- life jacket operation
- boarding and righting procedures and techniques
- swimming techniques (with life jackets)
- use of emergency equipment
- use of position indicating devices
- life raft operation including deployment
- safe water entry procedures
- platform and vessel procedures and systems/equipment
- helicopter recovery.

Consistency in Performance:
The maintenance and retention of the skills and knowledge contained within this unit of competency may be assessed by regular demonstration or proof of this competency as defined within or the facility safety case as appropriate.
### Essential Skills:

It would be expected that a person undertaking this unit of competency would be able to demonstrate
- life jacket operation
- boarding and righting procedures and techniques
- swimming techniques (with life jackets)
- use of emergency equipment
- use of position indicating devices
- life raft operation including deployment
- safe water entry procedures
- platform and vessel procedures and systems/equipment

### Resource Implications:

Standard resources & equipment found in the workplace should be used for the demonstration of competence

### Context of Assessment:

Competency may be demonstrated within a simulated context.
### UNIT TITLE:
*Operate, Monitor And Maintain Pipeline Facilities And Equipment (PMA HYD 230 A)*

### UNIT DESCRIPTOR:
This unit refers to the operation and monitoring of pipeline stations and associated facilities.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Prepare for operation</strong></td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1</td>
<td>Check operational area to ensure that any potential hazards which may affect operation of the equipment is controlled or removed</td>
</tr>
<tr>
<td>1.2</td>
<td>Conduct required safety checks and pre-start checks to determine or verify the operational condition and parameters of the equipment</td>
</tr>
<tr>
<td>1.3</td>
<td>Obtain tools, equipment and testing devices needed to carry out the work and check for correct operation and safety</td>
</tr>
<tr>
<td>1.4</td>
<td>Seek status of the system through communication with pipeline control centre personnel prior to commencing start-up</td>
</tr>
<tr>
<td><strong>2. Operate and monitor system</strong></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Monitor and adjust systems to allow for the most efficient operation in accordance with company procedures</td>
</tr>
<tr>
<td>2.2</td>
<td>Identify equipment faults through inspection and testing of the operational equipment</td>
</tr>
<tr>
<td>2.3</td>
<td>Monitor operating conditions of equipment through gauge levels, temperatures, flow indicators in order to determine performance of equipment and system</td>
</tr>
<tr>
<td>2.4</td>
<td>Apply fault finding and troubleshooting techniques to operational systems/equipment in order to identify any repairs or maintenance that may need to be undertaken</td>
</tr>
<tr>
<td>2.5</td>
<td>Monitor and convey information concerning the operation of the pipeline system to relevant personnel to ensure safe and efficient operation of the pipeline system</td>
</tr>
<tr>
<td>2.6</td>
<td>Select and apply emergency response in accordance with operating procedures to control the situation and prevent further risk of personal injury, or of product, equipment or environmental damage</td>
</tr>
<tr>
<td>2.7</td>
<td>Complete reports in accordance with operating procedures</td>
</tr>
<tr>
<td><strong>3. Shut down system/equipment</strong></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Apply emergency shutdown procedures in the event of serious equipment failure or operational parameters being exceeded</td>
</tr>
<tr>
<td>3.2</td>
<td>Complete shutdown in accordance with operating procedures and conditions</td>
</tr>
<tr>
<td>3.3</td>
<td>Maintain records/reports in accordance with company procedures</td>
</tr>
</tbody>
</table>
|   | 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 in accordance with operating 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 |
|---|---|---|
| 5. | Perform routine maintenance | 5.1 Adjust calibrate and test equipment and devices to ensure equipment and devices operate within specified ranges and maintain correct flow parameters to ensure gas availability  
5.2 Follow all manufacturers’ specifications strictly  
5.3 Select and interpret all necessary and appropriate plans, drawings and text in order to carry out servicing of equipment  
5.4 Calibrate equipment in accordance with manufacturer’s specifications, quality standards and company procedures  
5.5 Isolate work area to enable repair to proceed in accordance with OH&S and environmental legislative requirements and company procedures  
5.6 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 using established procedures in accordance with relevant Australian standards  
6.2 Notify work completion in accordance with company procedures  
6.3 Cancel where appropriate permit to work and sign off at completion of repair |
### RANGE OF VARIABLES:

**Context:**

Pipeline control systems include:
- compressor systems and equipment (compressors, monitoring systems, power supply systems, pumps, coolers, scrubbers, expanders, anti surge systems, safety systems and compressor control systems)
- prime movers may include turbine engines, reciprocating engines, electric motors (fuel and carburation systems, ignition systems, lubrication systems, induction and exhaust systems, governing systems, power supply systems, safety and shutdown systems)
- instrument and control system, (flow control equipment, pressure and temperature transmitters and transducers, telemetry equipment, gas chromatographs, moisture analysers, gas sampling equipment, PLCs)
- valve system (non-control valves, control and shut off valves, non-return or check valves and pressure relief valves and manual hand operated actuator, gas/hydraulic actuator and pneumatic valves).

Emergency responses include:
- gas leaks and fire
- equipment failure
- hazards and incidents.

Relevant personnel may include:
- supervisors
- maintenance personnel
- organisation employees
- contractors
- government bodies.

Tools, equipment and testing devices include:
- hand tools
- valves, actuators and flanges
- heaters and heat exchangers
- metering equipment
- process control equipment
- gas analysis equipment
- piping systems
- sumps and drains
- pressure vessels/filtration equipment
- prime movers
- pumping systems and equipment
- compression systems and equipment
- pig.
Types of faults may include:
- gas leaks
- electrical problems
- compressor or pump failure
- out of current inspection status
- gauge failure or hose rupture/leaks
- instruments out of calibration
- instruments and equipment require cleaning

Reports may include:
- routine and planned inspections (daily readings, monthly checks)
- scheduled maintenance activities
- mandatory or statutory inspections
- hazard and incident reports
- non-flow of gas.

Process equipment may include:
- heaters, furnaces and exchangers
- station instrumentation
- station power supplies
- metering equipment
- process control equipment.

Gas analysis equipment may include:
- valves, actuators and flanges
- piping systems
- sumps and drains
- pressure vessels/filtration equipment.

Documentation may include:
- standard operating procedures
- manufacturer's specifications
- OH&S standards
- statutory requirements
- Australian standards
- codes of practice
- quality assurance requirements
- permit to work/permit to enter.

The use and operation of personal computers, other hardware mediums and associated software applies.
**OH&S:**
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work
- job hazard analysis.

**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical aspects:
A person undertaking this unit of competency should possess a sound mechanical and process control background.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD236A Operate vehicles in the field.

Essential knowledge:
A demonstrated working knowledge and application of the company’s specific work operations and workflow would be highly regarded.

A demonstrated knowledge is essential of process equipment utilised within the pipeline industry, including:
- heaters, furnaces and exchangers
- station instrumentation
- station power supplies
- metering equipment
- process control equipment
- gas analysis equipment
- valves, actuators and flanges
- piping systems
- sumps and drains
- pressure vessels/filtration equipment.

An ability to compile reports and convey information concerning the control of the pipeline system/process in a clear and effective manner to all personnel is essential.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Prepare to odorise gas | 1.1 Check equipment in accordance with manufacturer’s specification to ensure it is operational  
1.2 Maintain records |
| 2. Control odorisation | 2.1 Maintain the odour of the gas in accordance with legislative requirements  
2.2 Store odorant in accordance with legislative requirements  
2.3 Handle odorant and/or transport in accordance with legislative requirements  
2.4 Handle waste products and manage in accordance with legislative requirements |
| 3. Shut down odorisation operations | 3.1 Apply emergency shutdown procedures in the event of serious equipment failure or operational parameters being exceeded  
3.2 Shutdown in accordance with operation conditions  
3.3 Maintain records/reports |
RANGE OF VARIABLES:

Context:
Tools and equipment to odorise gas may include:
- odour meter
- tools such as lance, hoses, regulators
- emergency response kit including absorption material
- sodium hypochlorite (neutraliser)
- masking agent
- reference standard
- level indicator (magnetic detector)
- personal protective equipment
- fire extinguishers
- emergency container
- transfer pump
- molecular sieve for venting.

Emergency response may include:
- gas leaks and fire
- equipment failure
- hazards and incidents.

Documentation may include:
- operating procedures
- OH&S and environmental legislative requirements
- manufacturer’s specifications
- Australian standards.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.
Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
Critical aspects of evidence will include:
- operational safety
- environmental and safety legislation
- correct odorant levels
- waste management procedures
- emergency response plans and procedures.

Concurrent Assessment and Prerequisites:
Nil

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
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<tr>
<th>ELEMENT</th>
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</thead>
</table>
| 1. Plan and prepare maintenance activity | 1.1 Interpret topographical and geographical maps to determine the selection of access and pipeline route  
1.2 Select and operate equipment appropriate to the maintenance task in accordance with manufacturer’s specifications  
1.3 Inspect and assess easement to determine the required maintenance activities  
1.4 Interpret assessment results and prepare reports/documents outlining further actions required |
| 2. Maintain pipeline easement and surrounding environment | 2.1 Maintain easement in accordance with environmental legislative requirements and enterprise requirements  
2.2 Isolate and secure work area to enable repair to proceed in accordance with legislative requirements and enterprise requirements  
2.3 Monitor and log the condition of signage/gates and easement ancillary equipment  
2.4 Undertake remedial action to ensure that signage/gates and ancillary equipment is maintained in accordance with legislative requirements |
| 3. Monitor civil activities | 3.1 Monitor civil works to ensure pipeline integrity and requirements are maintained and adhered to  
3.2 Restore work area and easement to legislative and enterprise standards  
3.3 Maintain records as necessary |
| 4. Maintain liaison with third parties | 4.1 Maintain continuous liaison and contact with landowners and contractors associated with the pipeline system  
4.2 Advise third parties of intended activities by the issue of appropriate notices  
4.3 Conduct meetings with third parties to discuss notified issues  
4.4 Record meeting outcomes for actioning and future reference in accordance with legislative requirements and enterprise requirements |
RANGE OF VARIABLES:
Context:
Records/documentation may include:
- OH&S and environmental legislative requirements
- erosion control documentation
- vegetation control documentation
- workplace mapping, eg, pipeline alignment drawings, topographical maps, geographical maps
- pipeline access route manuals
- MSDS information
- operating procedures.

Third parties may include:
- landowners
- local authorities
- emergency services
- other pipeline operators
- producers, customers, shippers and vendors
- government agencies and departments
- contractors.

Civil activities may include:
- laying of geotextile
- gabion baskets
- concreting
- reseeding of environment
- cased crossings
- fauna and flora control.

Reports may require the use of personal computers, other hardware media and associated software.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- workplace mapping, ie, pipeline alignment drawings, topographical maps, geographical maps and pipeline route access manual
- vegetation types including mimosa, noxious weeds, blackwattle and other native vegetation
- dangerous fauna/pests, eg feral pigs, donkeys, snakes, buffalo, camels
- knowledge of flight path restrictions
- permit to work
- job hazard analysis
- MSDS information.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
A person undertaking this unit of competency would also be expected to demonstrate an ability to not only maintain the pipeline easement, but also monitor and control all third party and contractor activity along and within the right of way.

The overall management and responsibility for the quality of local environment within the right of way/easement is regarded as an essential requirement of this unit of competency.

An ability to coordinate own and the work of others including on site contractors and other third party operators is an essential component of this competency.

It is expected that a person undertaking this competency demonstrate an awareness of all site specific safety requirements and demonstrate an ability to apply the permit to work system within the context of this unit.
Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAENV200A Monitor and control environmental hazards
- PMAHYD233A Monitor pipeline civil works
- PMAHYD236A Operate vehicles in the field.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
The application of appropriate local knowledge concerning the safe storage, loading, disposal and transfer of product within stated and company specific environmental procedures and requirements

It is essential that a person undertaking this competency demonstrate an ability to apply a range of control techniques and policies including:
- vegetation control techniques
- erosion control techniques
- company and legislative environmental policies and practices
- pipeline signage and application requirements.

It is expected that a person undertaking this unit would be able to demonstrate knowledge of the pipeline system and layout access routes.

A person undertaking this unit of competency must be able to identify and manage a range of dangerous/noxious fauna and flora within the easement.

An ability to manage and co-ordinate the activities and practices of a range of third party persons and or contractors is essential.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Monitor Pipeline Civil Works  (PMA HYD 233 A)

UNIT DESCRIPTOR:
This unit refers to civil works and maintenance activities required to be carried out in maintaining the pipeline easement and associated facilities.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Interpret civil drawings and data | 1.1 Determine required civil works through the interpretation of reports and investigations  
1.2 Access and interpret pipeline alignment drawings to determine area of excavation/civil activity  
1.3 Liaise with appropriate authorities, third parties and company personnel to advise of proposed works |
| 2. Select and inspect machinery | 2.1 Inspect equipment required to undertake civil works to ensure that it conforms to company requirements  
2.2 Transport equipment to site by the most appropriate method or means |
| 3. Prepare easement/site for civil activities | 3.1 Undertake site inspection of the civil works prior to any work commencing, ensuring layout and access to site is obtainable  
3.2 Prepare site in accordance with outcomes of inspection  
3.3 Apply knowledge of pipeline crossing design prior to excavation/activity commencing  
3.4 Issue permits to work in order for work to be carried out |
| 4. Monitor easement/site for civil activities | 4.1 Monitor civil works to ensure pipeline integrity and permit to work requirements are maintained and adhered to  
4.2 Apply knowledge of required health, safety and environmental legislative requirements to site works  
4.3 Restore the site and carry out easement on completion of civil works  
4.4 Verify and cancel issued permit to work |
RANGE OF VARIABLES:

Context:
- Legislative requirements may include:
  - relevant state and federal ohs acts
  - relevant state and federal environmental and Aboriginal lands Acts.
- Company requirements may include:
  - company procedures
  - company work instructions
  - environmental management programs.
- Equipment may include:
  - pipe locating equipment
  - gas detection equipment
  - transport and excavation equipment
  - hand tools
  - safety signage/barricades and materials.
- Pipeline crossings may include:
  - river crossings
  - rail crossings
  - road crossings.
- Civil activities may include:
  - laying of geotextile
  - gabion baskets
  - concreting
  - reseeding of environment
  - cased crossings
  - pipeline anchors
  - pipeline buoyancy control measures
  - erosion control techniques.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.
**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- pipeline facility layout drawings and P&IDs
- workplace mapping, ie, pipeline alignment drawings, topographical maps, geographical maps and pipeline route access manual
- emergency response plans and procedures
- job hazard analysis.

**Assessment Focus:**

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**EVIDENCE GUIDE:**

**Critical Aspects:**

It is expected that a person undertaking this competency demonstrates an awareness of all site specific safety and environmental requirements and an ability to apply the permit to work system within the context of this unit.

A person undertaking this unit of competency would be expected to be able to prepare or arrange for the safe preparation of the identified part of the easement or facility upon which the civil works are to take place.

**Concurrent Assessment and Prerequisites:**

This unit should be assessed concurrently with or following assessment in:
- PMAENV200A Monitor and control environmental hazards
- PMAHYD232A Maintain pipeline easements
- PMAHYD209A Monitor the permit to work
- PMAHYD236A Operate vehicles in the field.

Individual enterprises may choose to add other prerequisites relevant to their process.
**Essential Knowledge:**

A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

It is expected that a person undertaking this unit would be able to demonstrate an ability to interpret a range of pipeline alignment and site layout drawings associated with the identified civil work to be undertaken.

An ability to work with third party persons and contractors is essential.

An ability to co-ordinate own and the work of others including on site contractors and other third party operators is required as an essential component of this competency.

A person undertaking this unit must be able to demonstrate the knowledge and application of the following equipment:

- pipe locating equipment
- gas detection equipment
- transport and excavation equipment
- hand tools
- power tools, ie, electric, pneumatic
- safety signage/barricades and materials.

It would be expected that the underlying skills and knowledge contained within this unit would be applied to a range of civil works and requirements including:

- laying of geotextile
- gabion baskets
- concreting
- re-seeding of environment
- cased crossings
- pipeline anchors
- pipeline buoyancy control measures.

**Assessment Method, Context and Resource Implications:**

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

Install Cathodic Protection Systems And Equipment (PMA HYD 234 A)

## UNIT DESCRIPTOR:

This unit refers to the planning, installation and testing of cathodic protection (CP) systems utilised for pipeline systems.

## ELEMENT | PERFORMANCE CRITERIA

| 1. Plan installation of CP system | Demonstrates the ability to:
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1.1 Plan CP system installation procedures in accordance with appropriate Australian standards</td>
<td></td>
</tr>
<tr>
<td>1.2 Analyse data from completed surveys to determine system upgrades and modifications</td>
<td></td>
</tr>
<tr>
<td>1.3 Draft technical specifications and drawings from the analysed survey data</td>
<td></td>
</tr>
<tr>
<td>1.4 Maintain liaison with representatives of other utilities</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Install CP systems</th>
<th>Review approved specifications and drawings and obtain, inspect and record required materials for manufacture</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Configure and assemble identified materials and components as per the required design specifications</td>
<td></td>
</tr>
<tr>
<td>2.3 Rectify any detected defects prior to the system/component being installed</td>
<td></td>
</tr>
<tr>
<td>2.4 Install CP systems and components at identified location and test prior to commissioning</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Test and commission CP system</th>
<th>Conduct commissioning of the installed CP system and components</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2 Test CP system and collect further survey data to ensure system/component integrity has been achieved</td>
<td></td>
</tr>
<tr>
<td>3.3 Compile reports documenting the operation and performance of the installed CP system/component</td>
<td></td>
</tr>
</tbody>
</table>
**RANGE OF VARIABLES:**

**Context:**

Applicable Australian standards/legislation relevant to CP system may include:

- OH&S legislation
- utility codes and standards
- safe working procedures and practices
- AS 2885
- AS 2430 - hazardous areas
- AS 1768
- AS 1596
- AS 1697
- AS 2832.1
- AS 3000
- AS 2239
- AS 603.

Location for maintaining CP systems may be urban, country or remote. Third party activities and installations should be monitored.

Components and system may include:

- solar powered power generation systems
- 240 volt power generation systems
- insulation and monolithic joints
- galvanic anode bets
- battery banks - nicad and lead acid
- transformer rectifiers and CPUs
- lighting protection equipment
- CP test points
- Kirk cells.

Representatives in other utilities include:

- Other pipeline operators
- electrical
- rail
- telecommunication.

Types of checks and tests for CP systems may include:

- on potential surveys
- on/off potential surveys
- coating defect assessment surveys (DCVG method, Pearson technique/method, over pipeline potential method)
- loop impedance testing
- anode bed testing
- soil resistivity testing
- interference testing.
Test equipment may include:
- reference half cells
- multimeters
- dataloggers
- trycorders
- syncorders
- interrupters
- CDA equipment
- soil resistivity test equipment.

Drawings and specifications may include:
- instrument electrical drawings
- circuit diagrams
- component charts
- wiring diagrams
- site layout drawings.

The use of personal computers, other hardware mediums and associated software may be required.

**OH&S:**

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work
- job hazard analysis
- electrical equipment, which may include power and portable hand tools.
Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is expected that a person undertaking this competency demonstrates an awareness of all site specific safety and environmental requirements and an ability to apply the permit to work system within the context of this unit.

It is essential that a person undertaking this competency demonstrates an ability to interpret a range of cathodic protection data system surveys and readings in order to determine system upgrades and manufacture components.

A person undertaking this unit must be able to demonstrate the knowledge and application of a range of topographical and geographical maps and pipeline drawings as a normal part of their design and planning process.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD333A Monitor and maintain electrical systems
- PMAHYD334A Monitor & maintain pipeline cathodic protection systems
- PMAHYD230A Operate/monitor/maintain pipeline facilities/equipment.

Individual enterprises may choose to add other prerequisites relevant to their process.
**Essential Knowledge:**

A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

A person undertaking this unit of competency would also be expected to demonstrate an ability to not only maintain these systems but also communicate and report the operational condition and history of electrical systems to other team members and company personnel.

It is expected that a person undertaking this unit would be able to demonstrate a knowledge of cathodic protection systems and cathodic protection equipment.

A person undertaking this unit of competency would also be expected to demonstrate an ability to design, manufacture and install CP systems.

An ability to coordinate own and the work of others including on site contractors and other third party operators is required as an essential component of this competency.

A person undertaking this unit of competency would be expected to be able to undertake and analyse a range of tests and surveys including:

- on potential surveys
- on/off potential surveys
- CDA surveys
- loop impedance testing
- anode bed testing
- soil resistivity testing
- interference testing.

**Assessment Method, Context and Resource Implications:**

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

**Coat Pipelines (PMA HYD 235 A)**

## UNIT DESCRIPTOR:

This unit of competency refers to the inspection, testing and coating of gas pipelines.

## ELEMENT | PERFORMANCE CRITERIA
--- | ---
1. Prepare pipelines inspection/testing | 1.1 Plan and prepare inspection of pipeline coating in accordance with operating procedures  
1.2 Obtain tools and equipment needed to carry out the work in accordance with operating procedures and check for correct operation and safety  
1.3 Consult appropriate personnel to ensure the work is coordinated effectively with others involved on the work site  
1.4 Identify pipeline location to determine workplace

2. Inspect and test pipeline coatings | 2.1 Visually inspect pipeline coatings to determine condition and location of irregularities  
2.2 Plan and prepare pipeline testing in accordance with operating procedures  
2.3 Test pipeline as required to ensure system conforms to required operating parameters  
2.4 Report and record information related to status and any irregularity/deviations in accordance with operating procedures

3. Coat pipe | 3.1 Isolate work area to enable repair to proceed in accordance with legislative requirements and operating procedures  
3.2 Obtain, prepare and handle coating material in accordance with appropriate safety/hazard requirements and manufacturer’s specifications  
3.3 Apply coating material to pipeline in accordance with manufacturer’s specifications and company procedures  
3.4 Test new coating to ensure that the application meets requirements

4. Inspect, and notify completion of work | 4.1 Clean work site and dispose of waste materials in accordance with operating procedures and legislative requirements  
4.2 Return piping system to normal service in accordance with operating procedures  
4.3 Notify work completion, incidents and irregularities in accordance with operating procedures

5. Compile and analyse reports | 5.1 Collect and compile into accepted reporting format, information concerning deviations and repaired equipment  
5.2 Compile reports ensuring that they provide an accurate and ongoing record of deviations in pipeline systems and also provide a current record of pipeline and equipment coating trends  
5.3 Utilise information or reports for short and long term planning in deviation control
RANGE OF VARIABLES:

Context:
Testing and application equipment may include:
- abrasive blasting equipment
- compressors
- mobile plant
- pipe wrapping machines
- spray painting equipment
- hand/power tools
- LPG torch
- low voltage and high voltage holiday detectors
- paint thickness coating gauges and meters
- abrasive blast comparators and standards
- densitometers
- condensators
- coating defect assessment survey equipment, ie, DCVG method equipment, Pearson technique method equipment.

Coatings may include:
- heat shrink sleeves
- wrapping tapes
- epoxy paints
- coating patches.

Coating defect assessment surveys may include:
- DCVG method
- Pearson technique method.

Applicable Australian standards may include:
- AS 1627
- AS 1580.

Documentation may include:
- quality assurance requirements
- inspection and test reports.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.
### Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work
- job hazard analysis
- MSDS information and handling of chemicals/flammable liquids.

### Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

### Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

### EVIDENCE GUIDE:

#### Critical Aspects:
It is expected that a person undertaking this competency demonstrates an awareness of all site specific safety and environmental requirements.

The underlying skills and knowledge in this unit of competency should be readily transferable to those areas of work responsibility relating to the maintenance and repair of pipelines and pipeline facilities.

The application of the permit to work system underpins the application of this competency.

#### Concurrent Assessment and Prerequisites:
Nil:

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:

A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

Demonstrated knowledge of coating types, inspection and test requirements and quality assurance repair techniques is essential.

The utilisation of a range and variety of testing and application equipment is essential, including:

- abrasive blasting equipment and blasting mediums
- compressors
- mobile plant
- pipe wrapping machines
- spray painting equipment
- hand/power tools
- LPG torch
- low voltage and high voltage holiday detectors
- paint thickness coating gauges and meters
- abrasive blast comparators and standards
- densitometers
- condensators.

A demonstration of the safe use and handling of a range of dangerous and toxic chemicals and compounds and interpretation of MSD information is essential.

The application of site-specific and/or location-specific standard operating procedures and work instructions is essential.

Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

**Operate Vehicles In The Field**

UNIT DESCRIPTOR:
This unit refers to the operation of vehicles on the pipeline easement/access roads and off-road terrain.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepare vehicle and couple load</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Conduct vehicle familiarisation checks prior to commencement of journey</td>
<td></td>
</tr>
<tr>
<td>1.2 Note and rectify any defects where possible or report for further attention/repair</td>
<td></td>
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<tr>
<td>1.3 Ascertain that all required fuel, water and other supplies required for the journey are available and in useable order</td>
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</tr>
<tr>
<td>1.4 Inspect all ancillary equipment and operational accessories to ensure it has been attached or secured in a safe and agreed manner</td>
<td></td>
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<tr>
<td>1.5 Secure load using appropriate securing equipment</td>
<td></td>
</tr>
<tr>
<td>2. Undertake journey</td>
<td></td>
</tr>
<tr>
<td>2.1 Undertake familiarisation of route to ensure that required routes have been ascertained</td>
<td></td>
</tr>
<tr>
<td>2.2 Interpret access manuals and topographical maps in order to obtain required information for journey</td>
<td></td>
</tr>
<tr>
<td>2.3 Obtain relevant authorisations/notifications and accesses prior to commencement of the journey</td>
<td></td>
</tr>
<tr>
<td>2.4 Confirm, clarify or communicate journey with relevant company personnel</td>
<td></td>
</tr>
<tr>
<td>2.5 Monitor driving conditions and requirements constantly, to meet any changes in terrain, weather conditions and road conditions and requirements</td>
<td></td>
</tr>
<tr>
<td>2.6 Monitor fluid levels and air pressures and maintain to ensure safe and efficient vehicle operations</td>
<td></td>
</tr>
<tr>
<td>2.7 Monitor vehicle constantly for any malfunctions or factors that may affect vehicle performance</td>
<td></td>
</tr>
<tr>
<td>2.8 Maintain vehicle speeds within all stated limits and road dimensions to minimise the risk of personal injury, environmental damage and load damage</td>
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</tr>
<tr>
<td>2.9 Maintain communication as required with the relevant company personnel to advise of progress and journey status</td>
<td></td>
</tr>
<tr>
<td>3. Finalise journey</td>
<td></td>
</tr>
<tr>
<td>3.1 Communicate and confirm termination of journey with the relevant company personnel</td>
<td></td>
</tr>
<tr>
<td>3.2 Visually inspect the vehicle to ensure that vehicle is in good repair and order</td>
<td></td>
</tr>
<tr>
<td>3.3 Unsecured trailer loads and prepare for unloading utilising the agreed uncoupling process</td>
<td></td>
</tr>
<tr>
<td>3.4 Report faults or damage to vehicle to appropriate personnel</td>
<td></td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:

Vehicles and equipment may include:
- 4wd vehicles, ie, Landcruiser utility, troop carrier or station wagon
- trucks
- operation of communications equipment, ie, 2 way radio, mobile or satellite phone, GPS
- recovery equipment, ie, snatch straps, slings, chains and shackles
- trailers.

Road conditions may include:
- public highways
- roads
- pipeline access roads
- pipeline easement.

Journeys may include:
- base to base
- base to pipeline facility
- pipeline easement ground patrol.

Adverse driving conditions may relate to:
- weather
- road surface
- visibility.

Fluid levels may include:
- engine oil coolant
- clutch fluid
- windscreen washer fluid
- transmission fluid
- brake fluid.

Warning devices may include:
- warning lights
- speedometer
- tachometer
- oil pressure
- air pressure
- temperature gauges/warning lights
- brake warning lights
- fuel quantity gauges
- electrical charging
- ancillary systems indicators (eg, high beam, turn signals, parking brake).
Engine malfunctions may include:
- overheating (coolant, exhaust, driveline)
- low oil pressure
- electrical discharge/overcharge
- low air pressure
- ancillary systems
- abnormal emissions.

Relevant State and Federal road and traffic regulations and rules apply.

**OH&S:**
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work.

**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:
A person undertaking this unit of competency would be expected to demonstrate a knowledge and ability to interpret and apply information normally contained within road and easement/access road maps.

The person undertaking this unit of competency would be expected to operate a range of vehicles including 4WDs, cars and trucks.

The demonstrated ability to operate a range of vehicles within a variety of environmental and geographical locations is essential.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD232A Maintain pipeline easements
- PMAENV200A Monitor and control environmental hazards
- PMAHYD233A Monitor pipeline civil works
- PMAHYD331A Conduct pipeline pigging
- PMAHYD334A Monitor & maintain pipeline cathodic protection systems
- PMAHYD336A Undertake pipeline repairs and modifications
- PMAHYD230A Operate/monitor/maintain pipeline facilities/equipment.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
A person undertaking this unit of competency should be able to demonstrate the safe operation of a vehicle within all local/company rules and regulations.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
# UNIT TITLE:

**Undertake Crane, Dogging And Load Transfer Operations**

# UNIT DESCRIPTOR:

This unit refers to the movement of loads using a range of equipment, machinery, techniques and practices.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Plan and prepare work | 1.1 Adhere occupational, health and safety requirements to site information (plans, drawings, specifications, etc) as necessary  
1.2 Identify hazards in immediate work environment and take action to minimise risk  
1.3 Determine co-ordination requirements with other site personnel  
1.4 Determine job method to include hazard prevention and controls, Australian standards for safety procedures, codes of practice and manufacturer’s specifications  
1.5 Erect barricades, warning signs, overhead protection to requirements of state regulatory bodies, road traffic authorities, local government and enterprise  
1.6 Calculate mass and dimensions of load  
1.7 Calculate safe working load  
1.8 Determine positioning of load |
| 2. Select equipment | 2.1 Select lifting/moving equipment and accessories consistent with requirements and within safe working capacity of equipment  
2.2 Inspect gear and label and reject damaged/worn items  
2.3 Select, use and correctly fit personal protective equipment |
| 3. Secure load | 3.1 Secure load and protect to prevent damage  
3.2 Secure moving/loose parts of load and lash to prevent movement  
3.3 Attach, position, adjust and secure equipment correctly, to meet requirements for movement of load |
| 4. Move load | 4.1 Prepare load destination to accept load  
4.2 Move load safely to required destination in accordance with planned procedure  
4.3 Use standard communication signals to co-ordinate safe movement of the load |
| 5. Remove gear | 5.1 Remove equipment/gear/accessories safely from load  
5.2 Inspect equipment/gear/accessories for wear and damage, clean, maintain and store and record usage and condition  
5.3 Complete site/job records |
RANGE OF VARIABLES:

Context:
Equipment may include:
- forklift
- crane (max 10t)
- front end loader
- dogging and rigging equipment
- load shifting equipment (eg, slings, ropes, shackles, eye bolts, spreader beams, equalising gear, clamps, pulley systems, winches, packs, rigging screws).

Communication methods and signals may include:
- verbal
- with hand signals to Australian standards
- with whistle/hooter to Australian standards
- two-way radios/telephones
- with light signals to Australian standards.

Tasks to include movement of plant, equipment, and materials.

Licence standards for driving and operating load-shifting equipment apply.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work.
**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**EVIDENCE GUIDE:**

**Critical Aspects:**
It is expected that a person undertaking this competency demonstrates an awareness of all site specific safety requirements and an ability to apply the permit to work system within the context of this unit.

It is expected that a person undertaking this unit would be able to demonstrate the safe operation and handling of a range of load transfer vehicles, machinery and equipment within a pipeline or pipeline facility.

**Concurrent Assessment and Prerequisites:**
This unit should be assessed concurrently with or following assessment in:
- PMAHYD311A Undertake storage, loading and transfer of product.

Individual enterprises may choose to add other prerequisites relevant to their process.

**Essential Knowledge:**
A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

An ability to coordinate own and the work of others including on site contractors and other third party operators is required as an essential component of this competency.
Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Undertake First Response To Pipeline Incidents (PMA HYD 238 A)

UNIT DESCRIPTOR:
This unit of competency is designed to ensure that an appropriate first response to incidents of onshore situations/emergencies is achieved.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify emergency and raise alarm</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Evaluate and communicate in a timely and appropriate manner the location, nature and extent of the emergency</td>
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</tr>
<tr>
<td>1.2 Determine in order to evaluate the need, first response requirements to contain the emergency or evacuate the affected areas</td>
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</tr>
<tr>
<td>2. Initiate basic responses</td>
<td>2.1 Select the appropriate response from the emergency procedures and equipment</td>
</tr>
<tr>
<td>2.2 Mobilise and safely operate emergency equipment in order to contain the emergency incident</td>
<td></td>
</tr>
<tr>
<td>3. Undertake safe evacuation</td>
<td>3.1 Evacuate the area in a safe and controlled manner when first response has failed to control the emergency or has proven inappropriate</td>
</tr>
<tr>
<td></td>
<td>3.2 Secure the immediate area of the emergency to ensure no further loss occurs to people, equipment, materials, process and environment</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
This unit could be applied to any of the following installation or facilities:
- onshore pipeline systems and facilities
- pipeline easements
- maintenance bases.

Equipment may include:
- hand held extinguishers
- hose reels
- fire blankets
- smoke or self rescue respirators
- mobile and portable equipment
- first aid equipment
- pipeline repair clamps
- Lamb air movers
- barricades and signage
- communications equipment, ie, two way radios, mobile and sat phones and pagers.

This competency may be addressed through facility induction programs.

An ability to work alone is required.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.
In addition, knowledge of the following is necessary within this competency:

- the site or enterprise’s various emergency procedures and response plans
- permit to work
- site specific isolation procedures.

**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**EVIDENCE GUIDE:**
This competency would be applied by those persons working or operating within an onshore pipeline system installation or facility. The demonstration of this competency would be required by those persons who regularly work at pipeline facilities.

**Critical Aspects:**
Competency must be demonstrated through the knowledge and application of a range of techniques including:

- first response to fire fighting equipment and media
- first response to fire control and attack techniques and strategies
- self rescue techniques
- basic liaison techniques with third parties
- administering of first aid
- site securement techniques
- pipeline isolation procedures
- operation of communication equipment, eg, two way radios, mobile and sat phones, GPS, paging systems.

Competency in this unit is to be assessed on a regular basis.

**Concurrent Assessment and Prerequisites:**
Nil

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:

A person undertaking this competency would be required to demonstrate and apply the following techniques and knowledge:

- composition and uses of extinguishing agents and basic fire fighting equipment
- pipeline repair procedures and equipment
- liaison techniques with third parties
- use fire fighting equipment
- isolate pipeline sectors
- pipeline sections
- operation and use of communication systems.

It is important for the person undertaking this competency to be able to demonstrate clear communication skills and liaison with other pipeline system operations and support services when responding to a fire incident or conducting firefighting activities.

A demonstrated knowledge of the company or site specific procedures or requirements would underpin a person's competency in this unit.

Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulator and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE

**Conduct Artificial Lift** *(PMA HYD 300 A)*

### UNIT DESCRIPTOR:

This competency is focussed on providing assistance in order to lift fluids; it can also be applied to the artificial lift of oil, condensate and water.

### ELEMENT PERFORMANCE CRITERIA

**Demonstrates the ability to:**

1. **Produce product**
   - 1.1 Operate lifting process in accordance with local lease and lease equipment requirements and constraints
   - 1.2 Operate pumps, valves and other production equipment to transfer product/fluid from well to surface
   - 1.3 Test production equipment to ensure correct operating efficiencies are maintained
   - 1.4 Monitor valves, pumps and other production equipment to determine any operational faults and repairs required during the production phase
   - 1.5 Diagnose operational faults during the production phase

2. **Monitor product/volume efficiencies**
   - 2.1 Select and operate of 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

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
**RANGE OF VARIABLES:**

**Context:**
This competency is to be demonstrated in relation to a variety of wellhead situations and production equipment which may include:

- **pumps**
  - jet
  - electric submersible
  - beam
  - plunger lift
- **testing & monitoring equipment**
  - sona logs
  - dynameters
  - dipping equipment, tanks and treaters
  - pressures gauges
  - temperature gauges
  - flow meters
  - centrifuges
  - chart recorders
- **prime movers**
  - electric motors
  - diesel and gas engines
- **controllers**
  - electrical
  - pneumatic
  - mechanical
- **gas lift.**

**OH&S:**
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant environmental requirements along with an ability to implement them in a manner which is relevant to the operation of the equipment item. This is to include knowledge and achievement of State, Federal and local or site specific environmental and historical preservation legislative requirements.

Thorough knowledge of enterprise standard operating procedures is essential. Some awareness of the site’s business goals is required as a basis for decision making and action.
Conduct Artificial Lift (PMA HYD 300 A)

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

Competency should be assessed in a production or field environment, involving both the selection and the utilisation of a range of tools, and of testing and operational equipment, required to conduct the lifting of the product.

Persons undertaking this competency must be able to work largely unsupervised and possess the capacity to organise their own workflows and schedules in accordance with production demands and requirements.

Demonstration of the application of the competence across a representative range of equipment listed in the range of variables.

A demonstrated knowledge of the work permit system is required.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD201A Operate and monitor prime movers
- PMAHYD202A Operate and monitor pumping systems and equipment
- PMAHYD203A Operate and monitor valve systems.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Demonstration of competence in this unit must include knowledge of:
- down hole installation of equipment
- reservoir formation
- appropriate mechanical principles
- local knowledge concerning the well's operations
- principles of well operation
- pumping efficiencies, production volumes and product capacities.
Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on an operating site. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the Essential knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

**Undertake Well Management** *(PMA HYD 301 A)*

**UNIT DESCRIPTOR:**
This competency is focused on well management which maximises the productive capacity and productive life of a well.

<table>
<thead>
<tr>
<th>ELEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Produce oil and gas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates the ability to:</td>
</tr>
</tbody>
</table>

1. Manage the well effectively and efficiently by applying a knowledge of reservoir and downhole characteristics
2. Utilise process control instrumentation to produce oil/gas
3. Operate valves to control and direct flows to meet demand requirements
4. Liaise with other services and contractors during the production phase
5. Collect, interpret, correlate and report or communicate upon selected data

2. Conduct flow measurement |

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply appropriate mathematical formulae and formats to determine and quantify product volumes</td>
</tr>
</tbody>
</table>

2. Collect and utilise appropriate production data to determine product flows
3. Historical data and records are analysed in order to monitor and determine well performance
4. Calculate production figures and targets, and apply this data to all functions related to this competency

3. Maintain well and associated production equipment |

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine operational condition and efficiencies of equipment</td>
</tr>
</tbody>
</table>

2. Implement corrosion control procedures for all equipment to maintain its operating integrity
3. Conduct personal inspections of instrumentation equipment and rectify faults where possible or report to appropriate person or service group
4. Liaise with maintenance operations to determine and prioritise any required operational maintenance

4. Handle product transfer |

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Properly separate products into their respective product groupings</td>
</tr>
</tbody>
</table>

2. Treat all excess separation process waste water through the utilising the appropriate chemical and disposal techniques
3. Transfer product to appropriate location for future processing or sale
4. Maintain all well logs and records as required
RANGE OF VARIABLES:

Context:
Well equipment may include:
- valves
  - ball gate, safety, process control and NRV
- pumps
  - positive displacement and centrifugal displacement
- prime movers
  - diesel, gas engines and electric motors
- product separation units
  - dewatering tanks, multi-phase, high and low pressure
- instrumentation
  - pressure & flow controls, pressure regulators, telemetry
- testing equipment
  - dynamometers and synologs
  - gas testers.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
**EVIDENCE GUIDE:**

**Critical Aspects:**

A demonstrated ability to perform various forms of operational maintenance unassisted or be able to determine operational faults in production equipment.

Evidence of knowledge concerning the operation and characteristics of the well and well management techniques, and how these are applied so as to maximise the productive life of the well.

Ability to effectively predict the working life of a gas or oil reserve.

Ability to recognise and analyse potential situations requiring action and implement appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency should be assessed in the field whilst work is being undertaken on the well, utilising a range of hands tools, production equipment, testing equipment & techniques and products. It would be expected that persons undertaking this competency would demonstrate an ability to organise and plan their own specific workflows and requirements, and to work with a minimum of supervision whilst in the field.

**Concurrent Assessment and Prerequisites:**

This unit should be assessed concurrently with or following assessment in:

- PMAHYD201A Operate and monitor prime movers
- PMAHYD202A Operate and monitor pumping systems and equipment
- PMAHYD203A Operate and monitor valve systems.

Individual enterprises may choose to add other prerequisites relevant to their process.

**Essential Knowledge:**

Demonstration of competence in this unit must include knowledge of:

- 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.
Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

Monitor & Operate Fire And Gas Detection Systems (PMA HYD 302 A)

## UNIT DESCRIPTOR:
This competency covers the monitoring and operation of local on-shore and off-shore fire and gas detection systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Respond to emergency</td>
<td>1.1 Correctly interpret alarm codes to ensure the correct response strategy is selected and applied to the situation</td>
</tr>
<tr>
<td></td>
<td>1.2 Evaluate internal messages and response communications concerning incidents to establish the scope and severity of the emergency</td>
</tr>
<tr>
<td></td>
<td>1.3 Determine the required course of action or emergency response, from knowledge of local emergency procedures, in order to control the identified emergency and prevent further risk of injury or damage</td>
</tr>
<tr>
<td>2 Restore safe operating conditions</td>
<td>2.1 Isolate identified faults and relay the information to outside operators and services for further safety checks to be conducted to identify further risks to process equipment and personnel</td>
</tr>
<tr>
<td></td>
<td>2.2 Report safety risks to designated personnel for further action or advice concerning the selection of the appropriate response or course of action</td>
</tr>
<tr>
<td></td>
<td>2.3 Ensure all identified maintenance is undertaken in compliance with the permit to work system, and is administered to ensure that all work complies with all issued permits</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
This competency can be applied to both on-shore and off-shore situations, and to the use of either DCS or analogue systems. It is to be demonstrated in regard to control systems which can include:

- fire and gas detection, extinguishing and deluge systems
- emergency systems
- alarm systems
- communication systems
- utilities.

Engineering schematics can include PEFs, P&IDs and other forms of engineering drawings or process schematics.

All environmental legislative and specific enterprise procedures and policies, including the permit to work system, must be met.

All operations are to be performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:

It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

It is essential that the person undertaking this competency be able to demonstrate the operation of:

- alarm systems
- emergency systems, including fire and shutdown
- communication systems, including radio, fax and phone.

This competency should be assessed in the work environment, utilising a variety of process control systems and control mechanisms.

It is expected that a person undertaking this competency would have operated the site specific control systems and instrumentation.

The ability to work under and manage situations of high pressure is desirable, in order that the safe and efficient management of the control room production process is maintained and the safety of plant employees is assured.

Concurrent Assessment and Prerequisites:

This unit should be assessed concurrently with or following assessment in:

- PMACOM100ARelay and respond to information
- appropriate ‘process’ unit(s).

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:

Demonstration of competence in this unit must include knowledge of:

- architecture of the process/production systems
- plant knowledge
- systems operating parameters
- process control philosophies and strategies
- outside process knowledge and equipment operation.
**Assessment Method, Context and Resource Implications:**

Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.

An ability to co-ordinate with other work groups and a demonstrated knowledge of the interrelationships within the production/process areas in order to manage any given situation would be considered as being an essential component of this unit of competency.
**UNIT TITLE:**

*Operate Process Control Systems (PMA HYD 303 A)*

**UNIT DESCRIPTOR:**

This competency covers the manipulation of the production process, including planned and unplanned start-up and shutdown operations.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Operate keyboard/interface</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td></td>
<td>1.1 Maintain keyboard/operator interface and keep field operator informed on developments</td>
</tr>
<tr>
<td></td>
<td>1.2 Use information to identify potential faults</td>
</tr>
<tr>
<td></td>
<td>1.3 Select appropriate controller modes to ensure the effective control of the process</td>
</tr>
<tr>
<td></td>
<td>1.4 Undertake required set point/output changes to meet plant and process requirements</td>
</tr>
<tr>
<td></td>
<td>1.5 Access historical data and information</td>
</tr>
<tr>
<td>2. Assess data</td>
<td>2.1 Interpret alarms and prioritise steps to ensure control of system is maintained</td>
</tr>
<tr>
<td></td>
<td>2.2 Minimise fluctuations and variations in process through the interpretation of existing trends and control schematics</td>
</tr>
<tr>
<td></td>
<td>2.3 Obtain relevant data and information from the control system by applying systems knowledge</td>
</tr>
<tr>
<td></td>
<td>2.4 Assess historical data to assist the identification of problems and selection of troubleshooting techniques to deal with them</td>
</tr>
<tr>
<td>3. Manage planned shutdowns</td>
<td>3.1 Select and apply stated operational procedures to the shutdown process in order to guide the required shutdown process and sequence</td>
</tr>
<tr>
<td></td>
<td>3.2 Communicate with all operational areas and personnel affected by the shutdown to ensure the safety of the system and process is maintained during the shutdown process</td>
</tr>
<tr>
<td>4. Co-ordinate control actions</td>
<td>4.1 Maintain co-ordination with all outside services and operations in order to assist in the correct identification and reporting of all faults</td>
</tr>
<tr>
<td></td>
<td>4.2 Implement all required and stated emergency responses and ensure the outcomes of these responses are communicated to all affected areas</td>
</tr>
<tr>
<td></td>
<td>4.3 Maintain and log all required information for further action to provide a historical record of all events</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
This competency unit can be applied to DCS and all analogue control systems and the following equipment:
- personal computers, other hardware mediums and associated software
- fire and gas detection/protection systems.

This unit should be applied to situations where planned shutdowns are required, where the operator is one step ahead of the process and controls the shutdown process.

The work in this competency can relate to planned and unplanned control of the process and production systems.

Work may involve both the ability to work within a team environment and also to work both independently of others.

The application of all stated emergency procedures which are relevant to the site or enterprise, including the permit to work system, is required.

All operations are to be performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:

An ability to communicate with a variety of areas, both internal and external to the production process, and the choice of the appropriate medium to conduct this communication, are essential components of this competency.

It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency should be assessed in the work environment, utilising a variety of process control systems and control mechanisms.

The person undertaking this competency should have operated the required or site specific control systems and instrumentation.

Persons undertaking this competency should be able to work under and manage situations of high pressure, in order that the safe and efficient management of the control room production process is maintained and the safety of plant employees is assured. It is essential that the person undertaking this competency be able to demonstrate the operation of:

- alarm systems
- emergency systems, including fire and shutdown
- communication systems, including radio, fax and phone.

Concurrent Assessment and Prerequisites:

This unit should be assessed concurrently with or following assessment in:

- appropriate ‘process’ unit(s) at level 3.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:

The person would be expected to demonstrate a working knowledge of:

- the architecture of the process/production systems
- the specific plant
- product specifications and tolerances
- systems operating parameters
- process control philosophies and strategies
- process knowledge
- emergency shutdown procedures
- industry entry level physics, chemistry and mathematics.
Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.

This competency should be assessed in the work environment, and the individual should have operated the required or site specific control systems and instrumentation utilising a variety of process control systems and control mechanisms.

Persons undertaking this competency should be able to work under and manage situations of high pressure.
## UNIT TITLE:

**Correct Product Deviations (PMA HYD 304 A)**

## UNIT DESCRIPTOR:

This competency covers monitoring and adjustment of product quality during the production process.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Control temperatures, pressures and flows | 1.1 Check temperature, pressures and flows against stated product specifications at regular intervals in order to control production rates  
  1.2 Identify and determine variations in process from a knowledge and understanding of the relationship between temperature, pressures and flow rates  
  1.3 Modify and adjust temperature, pressures and flows to maintain production targets within agreed safety boundaries and product control parameters  
  1.4 Start up and shutdown operational equipment in a controlled manner and in accordance with enterprise and plant safety specifications  
  1.5 Identify and correct product deviation by using appropriate process control methods  
  1.6 Trace and verify the cause of problems in the system to confirm what further action may be required in order to control the deviation  
  1.7 Apply knowledge of equipment limitations to ensure the deviation is controlled and the process is restored to normal operating condition  
  1.8 Select the appropriate emergency response to control the deviation if normal operating conditions cannot be realised or obtained |
| 2. Determine cause of deviations              | 2.1 Determine probable cause of deviation from available information on control and display panels  
  2.2 Determine cause of deviation from available information  
  2.3 Confirm identified cause from other sources |
| 3. Compile and analyse deviation reports     | 3.1 Collect information about deviations and put into accepted reporting format  
  3.2 Compile reports, ensuring that they provide an accurate and ongoing record of deviations in production processes and a current record of production and equipment trends  
  3.3 Use information or reports for short and long-term planning in deviation control |
RANGE OF VARIABLES:

Context:
This competency unit can be applied to DCS and analogue control systems and includes all such items of equipment as:
- alarm systems
- emergency systems, including fire and shutdown
- communication systems, including radio, fax and phone.
- personal computers, other hardware mediums and associated software.

Work may involve both the ability to work within a team environment and also to work independently of others is required.

The application of all stated emergency procedures which are relevant to the site or enterprise is required.

The permit to work system applies.

Required reporting techniques and formats should be followed.

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant legislative and enterprise OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the site or enterprise.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.
### Updating Information:

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

### EVIDENCE GUIDE:

#### Critical Aspects:

It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

An ability to communicate with a variety of areas, both internal and external to the production process, and the choice of the appropriate medium to conduct this communication, are essential components of this competency.

#### Concurrent Assessment and Prerequisites:

This unit should be assessed concurrently with or following assessment in:

- PMAHYD303A Operate process control systems
- Appropriate ‘process’ unit(s) at AQF level 3.

Individual enterprises may choose to add other prerequisites relevant to their process.

#### Essential Knowledge:

Demonstration of competence in this unit must include knowledge of:

- the 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
  - industry entry level physics, chemistry and mathematics
  - outside process knowledge and equipment operation
  - alarm systems
  - emergency systems including fire, gas and shutdown
  - communication systems including radio, fax and telephone.
Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

This competency should be assessed in the work environment, utilising a variety of process control systems and control mechanisms.

It is expected that a person undertaking this competency would have operated the site specific control systems and instrumentation.

Persons undertaking this competency should be able to work under and manage situations of high pressure, so that the safe and efficient management of the control room production process is maintained and the safety of plant employees is assured.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Generate Electrical Power (PMA HYD 305 A)*

**UNIT DESCRIPTOR:**
This competency covers the production and provision of power for process and life support systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Prepare for power generation | 1.1 Predetermine the source of the prime mover to be utilised in the generation process through the specific site's selected generation process equipment  
1.2 Create energy for the generation system in compliance with site specific generation equipment and fuel system requirements  
1.3 Conduct pre-start-up checks on all operating equipment and required machinery and systems to determine their operational condition and working order  
1.4 Synchronise all equipment to transfer the power safely into the process system |
| 2. Operate generation equipment | 2.1 Balance equipment loads and equally share all machine power factors and loads to initiate the safe distribution of power to the system  
2.2 Select system for the generation process appropriate to voltage systems and requirements  
2.3 Monitor and adjust loads as required to ensure that all machine loads are maintained within safe working conditions  
2.4 Distribute energy to the generation system in a safe and efficient manner, ensuring that the status of all equipment is continually monitored  
2.5 Balance loads continuously so as to maximise production efficiency  
2.6 Maintain logs to record all systems data and identify all deviations or problems encountered |
| 3. Shut down process           | 3.1 Communicate shutdown of process to all outside operators  
3.2 Systematically shed Loads during the shutdown process  
3.3 Isolate all required equipment from the bus to allow for a safe shutdown to take place  
3.4 Return the system to a balanced operating condition after shutdown is completed |
RANGE OF VARIABLES:

Context:

Electrical power systems may include:

- extra-low voltage – up to 32V AC or 115V DC
- low voltage - exceeding extra-low voltage, up to 1000V AC or 1500V DC
- high voltage - exceeding low voltage
- battery systems
- UPS.

This unit only applies to generating equipment, prime movers are covered under their own competency unit.

All operations are performed in accordance with standard operating procedures.

OH&S:

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
**EVIDENCE GUIDE:**

**Critical Aspects:**
- It is essential that a person undertaking this competency demonstrate an awareness of all required site specific safety requirements and have an ability to understand the operation of the permit to work system and the consequences of the permit system in relation to this unit.

- Evidence of the knowledge and skills associated with one or more of the fuel or energy systems' operation is essential. A person undertaking this competency must be able to demonstrate the ability to operate a specific generation process and be accordingly recognised for that specific system's operation.

- It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

**Concurrent Assessment and Prerequisites:**
- This unit should be assessed concurrently with or following assessment in:
  - PMAHYD201A Operate and monitor prime movers.

- Individual enterprises may choose to add other prerequisites relevant to their process.

**Essential Knowledge:**
- Demonstration of competence in this unit must include knowledge of the following techniques and theories:
  - cathodic protection techniques
  - switching techniques
  - isolation procedures
  - earthing techniques.
  - voltage systems
  - electronics theory
  - theory of synchronisation.
Assessment Method, Context and Resource Implications:

Competency should be assessed in the work environment and should be conducted whilst power is being generated for use within the process system. It is expected that the person undertaking this competency should demonstrate a working knowledge of the plant layout and operation, including the location of all distribution boards and systems required in the generation process.

An ability to work with and co-ordinate the workflows of other services or process units is an essential component of this competency.

A demonstrated ability to work both within a team or individual context and within a range of conditions and contexts is considered highly desirable.

The assessment of this particular competency will vary from site to site and will depend on the type of energy system utilised. Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

*Produce Product (1) - Gas Absorption (PMA HYD 306 A)*

## UNIT DESCRIPTOR:

This competency covers the use of the gas absorption process in the production of a finished gas product prior to shipping and downstream transfer.

## ELEMENT PERFORMANCE CRITERIA

### ELEMENT 1. Interface with process and condition

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1. Check the operational condition of all process equipment to ensure that it is functioning within the specific operating parameters</td>
</tr>
<tr>
<td>2. Make ready and bring on line absorption systems ensuring all equipment is sequenced prior to commencing the process</td>
</tr>
<tr>
<td>3. Undertake product gas absorption safely and efficiently using process knowledge and equipment knowledge</td>
</tr>
</tbody>
</table>

### ELEMENT 2. Undertake gas absorption

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use process equipment, ensuring that all required valves, systems and equipment are sequenced to provide an undisrupted process</td>
</tr>
<tr>
<td>Select and use the appropriate medium/s in the stripping and rectification of the product</td>
</tr>
<tr>
<td>Recover all hydrocarbons from the medium for further regeneration and absorption</td>
</tr>
<tr>
<td>Monitor vapour pressures to ensure that product specifications stay within parameters and tolerances</td>
</tr>
<tr>
<td>Top up and drain mediums used in the process as required or determined by the process conditions being encountered</td>
</tr>
<tr>
<td>Maintain liaison with outside operators throughout the process, to undertake manual adjustments of identified operating equipment</td>
</tr>
<tr>
<td>Monitor product breakthroughs and saturation to reduce the likelihood of product contamination</td>
</tr>
<tr>
<td>Isolate and purge identified operational equipment to alleviate and reduce moisture CO₂ levels in the process</td>
</tr>
</tbody>
</table>

### ELEMENT 3. Prepare equipment for maintenance

<table>
<thead>
<tr>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicate required maintenance of equipment and ensure this is completed within the constraints of the issued permit to work</td>
</tr>
<tr>
<td>Record and note identified process upsets and equipment faults for further action and investigation at the conclusion of the process</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
General absorption operating systems and equipment include:
- high pressure steam systems
- heat exchangers and coolers and cooling systems
- turbines, including LSO, relay oil and governing
- pumps
- valves
- regeneration or top-up systems
- emergency shutdown systems.

This competency would be demonstrated within a team environment and in conjunction with the overall control of the production process.

Relevant legislative, and environmental policies and procedures apply.

PEFs & P&IDs and other forms of engineering drawings or schematics is expected.

Requirements of the permit to work system must be met.

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
Critical Aspects:
   It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

Concurrent Assessment and Prerequisites:
   This unit should be assessed concurrently with or following assessment in:
   - PMAHYD201A  Operate and monitor prime movers
   - PMAHYD202A  Operate and monitor pumping systems and equipment
   - PMAHYD203A  Operate and monitor valve systems.

   Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
   Demonstration of competence in this unit must include knowledge of the following
   - architecture of the process/production system
   - the plant
   - product tolerances and specifications
   - systems operating parameters
   - process control philosophies and strategies
   - the process
   - outside process/production operational knowledge, including column operation, furnaces and trays
   - extraction principles
   - other process equipment, including valves
   - industry entry level physics and chemistry.
Assessment Method, Context and Resource Implications:

This competency can be assessed in either a workplace or simulated environment, utilising a variety of process equipment, control systems and mechanisms.

It is expected that a person undertaking this competency would be able to demonstrate the required competencies to control the production process, and to identify and correct product deviations and product hazards, in a safe and systematic manner.

A person undertaking this competency must be able to work under and manage situations of high pressure. The ability to both work with others in a team environment and demonstrate the flexibility to work largely unsupervised, and to direct or assist other operators both with a control and plant environment, are highly desirable.

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Produce Product (2) - Dehydration (PMA HYD 307 A)*

**UNIT DESCRIPTOR:**
This competency covers the use and operation of the dehydration process in the production of a finished product prior to storage and loading.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEMONSTRATES the ability to:</td>
<td></td>
</tr>
</tbody>
</table>
| 1. Interface with process and condition | 1.1 Check the operational condition of all process equipment required to ensure that it is functioning within the specific operating parameters  
1.2 Make ready and bring dehydration systems on line, ensuring all equipment is sequenced prior to commencing the process  
1.3 Undertake product dehydration safely and efficiently using process knowledge and equipment knowledge |
| 2. Undertake dehydration of product | 2.1 Apply hydride formation, absorption and/or adsorption process theories  
2.2 Monitor and adjust operational limitations and parameters of all process equipment during the dehydration process  
2.3 Manipulate and adjust operating valves and control valves in order to keep product moisture maintained within specification  
2.4 Monitor heating and cooling times during the dehydration process so as to maintain stability  
2.5 Regenerate the drying medium through maintenance of the specified process tolerances and parameters  
2.6 Maintain liaison with outside operators throughout the process, in order that manual adjustments of identified operating equipment can be conducted  
2.7 Resequence process equipment as required to achieve and maintain required operating criteria |
| 3. Identify product hazards and variations | 3.1 Identify all production hazards through the application of logic control drawings and flow charts, to troubleshoot the process and determine what corrective actions may need to be undertaken  
3.2 Undertake troubleshooting of the process to determine what corrective action should be utilised to reduce the likelihood of impurities in the product caused by breakthrough or saturation |
4. Record process variations

<table>
<thead>
<tr>
<th>4.1 Record product variations, noting the type of variation and actions undertaken to rectify the deviation as a reference for further action and investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2 Arrange required maintenance of operational equipment and communicate to appropriate personnel</td>
</tr>
<tr>
<td>4.3 Isolate identified operational equipment from the process and purge to remove the likelihood of further product impurities occurring</td>
</tr>
</tbody>
</table>

### RANGE OF VARIABLES:

**Context:**

Dehydration control systems and equipment may include:

- vessels
- valves
- compressors
- piping systems
- exchangers - furnaces
- columns and towers
- cooling and heating systems
- burner management systems.

Site or enterprise hazard identification strategies and philosophies apply.

Legislative and enterprise environmental requirements and procedures, including the permit to work system, must be complied with.

This competency can be conducted either within a team environment or individually.

All operations are performed in accordance with standard operating procedures.

An ability to interface with and control the process, and to interface and liaise with other work groups external to the control process, is essential.

**OH&S:**

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
This competency can be assessed in either a workplace or simulated environment, utilising a variety of process equipment, control systems and mechanisms.

It is expected a person undertaking this competency would be able to demonstrate the required competencies to control the production process, identify and correct product deviations and recognise product hazards in a safe and systematic manner.

A person undertaking this competency must be able to work under and manage situations of high pressure. An ability to both be able to work with others in a team environment yet demonstrate the flexibility to work largely unsupervised, and to direct or assist other operators in both a control and plant environment, are highly desirable.

Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
• PMAHYD203A Operate and monitor valve systems.

Individual enterprises may choose to add other prerequisites relevant to their process.
### Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following
- architecture of the process/production system
- the plant
- product tolerances and specifications
- systems operating parameters
- process control philosophies and strategies
- the process
- outside process/production operational knowledge, including columns, furnaces and trays
- extraction principles
- other process equipment, including valves
- industry entry level physics and chemistry
- molecular structure of products.
- hydrate formation
- adsorption
- desorption
- alarm systems
- communication systems.

### Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulator and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

### Produce Product (3) - Distillation  
(PMA HYD 308 A)

## UNIT DESCRIPTOR:

This competency covers the use of the distillation process in the production of a finished gas product prior to shipping and downstream transfer.

### ELEMENT PERFORMANCE CRITERIA

Demonstrates the ability to:

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Interface with process | 1.1 Bring into operation equipment required for the distillation process of the product, ensuring all columns and boilers required are operating within normal operating parameters  
1.2 Maintain stable production during the distillation process by applying distillation, fractionation and refrigeration theories  
1.3 Correctly sequence all rotating equipment required before commencing the process |
| 2. Monitor distillation process of product | 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 Monitor heating and cooling mediums to ensure that temperatures remain within specified parameters  
2.4 Alter temperature values of the product to ensure the product remains within specification at variable flow rates  
2.5 Maintain liaison with outside operators throughout the process, so appropriate field adjustments of identified operating equipment are conducted  
2.6 Monitor and analyse data from columns and trays in operation to determine the quality of the product and what courses of corrective action need to be initiated  
2.7 Stabilise product through efficient process control prior to the product being transferred to the nominated storage location |
| 3. Transfer product to storage | 3.1 Transfer the finished product to the nominated storage location by pipeline transfer  
3.2 Record product movements as a historical record of the quantity and quality of the finished product |
RANGE OF VARIABLES:

Context:
Distillation equipment may include:
- columns
- trays
- compressors
- pumps
- valves
- heat exchangers.

All operations are performed in accordance with standard operating procedures.

This competency would be undertaken within a team environment and in conjunction with the overall control of the product being produced.

Relevant legislative and environmental policies and procedures must be complied with.

The permit to work system applies.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Evidence of the transferability of the underpinning skills and knowledge in this competency to other areas within the products production is required. These skills should be readily transferable to the gas absorption process the liquid extraction process the dehydration process storage and loading.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.
**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**EVIDENCE GUIDE:**

**Critical Aspects:**
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This unit can be assessed in either a workplace or simulated environment, using a range of process equipment, control systems and mechanisms.

It is expected that a person undertaking this competency would be able to demonstrate the required competencies to control the production process, and to identify and correct product deviations and recognise product hazards, in a safe and systematic manner.

A person undertaking this competency must be able to work under and manage situations of high pressure. An ability to both be able to work with others in a team environment and to demonstrate the flexibility to work largely unsupervised, as well as to direct or assist other operators within both a control and plant environment, is highly desirable.

**Concurrent Assessment and Prerequisites:**
This unit should be assessed concurrently with or following assessment in:
- PMAHYD202A Operate and monitor pumping systems and equipment
- PMAHYD203A Operate and monitor valve systems
- PMAPROC205A Operate heat exchangers.

Individual enterprises may choose to add other prerequisites relevant to their process.
**Essential Knowledge:**
Demonstration of competence in this unit must include knowledge of the following

- architecture of the process/production system
- the plant
- product tolerances, limitations and specifications
- systems operating parameters
- process control philosophies and strategies
- the process
- outside process/production operational knowledge (including column, tray and boiler operations) and distillation principles (including stripping and rectification)
- heating and cooling principles
- stabilisation principles
- other process equipment, including valves
- industry entry level physics and chemistry
- storage and loading techniques and mediums.
- alarm systems
- communication systems.

**Assessment Method, Context and Resource Implications:**
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

*Produce Product (4) - Liquid Extraction*  
(PMA HYD 309 A)

## UNIT DESCRIPTOR:

This competency covers the fractionation or liquid extraction of product in the production of a finished product prior to shipping and downstream transfer.

## ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Interface with process | Demonstrates the ability to:  
1.1 Bring process equipment into operational condition, ensuring that all trays, columns and heat exchangers are operating within their specified parameters  
1.2 Make ready liquid extraction systems and related equipment and bring on line during start-up  
1.3 Maintain the extraction process in a safe and efficient manner by application of turbo expander and Joules Thomson theories and principles |
| 2. Monitor liquid extraction process |  
2.1 Undertake low temperature separation of the product through the use of turbo expanders  
2.2 Maintain the product in a compressed, cooled and expand ongoing operational condition  
2.3 Monitor the product's variable pressures, boiling points and temperatures visually or by alarm systems and adjust as required to ensure the product stays within its defined specifications  
2.4 Monitor and maintain process equipment, including all pumps, compressors, heat exchangers and fans, within agreed operating parameters  
2.5 Maintain liaison with outside operators throughout the process, and conduct to ensure field adjustment of identified operating equipment  
2.6 Use materials safety data sheets to identify any cryogenic or other production hazards and to determine what safety requirements may be necessary  
2.7 Transfer product to the next stage of the production process to allow further fractionation or treatment of the product to take place |
| 3. Record product & equipment deviations |  
3.1 Maintain records during the process in order to provide a historical record and a guide to what further action or responses should be initiated  
3.2 Identify and communicate required maintenance of operational equipment to appropriate personnel, and ensure work is completed within the constraints of the issued work permit  
3.3 Purge and isolate process equipment identified for maintenance to make it safe, so that the identified maintenance requirements may be completed |
RANGE OF VARIABLES:
Context:
Operating equipment and systems may include:
- heat exchangers
- fans
- expanders
- compressors
- pumps
- valves
- refrigeration systems or cryogenic systems.

This competency would be undertaken within a team environment and in conjunction with the overall control of the product being produced.

All operations are performed in accordance with standard operating procedures.

Relevant legislative and environmental requirements and applicable site or enterprise safety and environmental policies and procedures, including the permit to work System, must be adhered to.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:

It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency can be assessed in either a workplace or simulated environment, using a range of process equipment, control systems and mechanisms.

It is expected that a person undertaking this competency would be able to demonstrate the required competencies to control the production process, to identify and correct product deviations and to recognise product hazards in a safe and systematic manner.

A person undertaking this competency must be able to work under and manage situations of high pressure. An ability to both be able to work with others in a team environment and demonstrate the flexibility to work largely unsupervised, as well as to direct or assist other operators both with a control and plant environment, is highly desirable.

Concurrent Assessment and Prerequisites:

This unit should be assessed concurrently with or following assessment in:

- PMAHYD314A Operate and monitor compressor systems and equipment
- PMAPROC205A Operate heat exchangers.

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following
- architecture of the process/production system
- the plant
- product tolerances, limitations and specifications
- systems operating parameters
- industry entry level physics and chemistry
- process control philosophies and strategies
- the process
- stabilisation principles
- outside process/production operational knowledge, including expanders, exchangers, compressors and fans
- other process equipment, including valves.
- alarm systems
- communication systems
- latent heat theory
- Joules Thomson principles
- auto refrigeration principles
- cryogenic operations
- refrigerant types.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Produce Product (5) - Filtration  
(PMA HYD 310 A)

UNIT DESCRIPTOR:
This unit of competency covers the use of the filtration process in the production of finished or intermediate gas product prior to shipping or downstream transfer.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interface with process</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Check the operational condition of all process equipment required to ensure that it is functioning within the specified parameters</td>
<td></td>
</tr>
<tr>
<td>1.2 Make ready filtration equipment or systems and bring on line during start-up</td>
<td></td>
</tr>
<tr>
<td>1.3 Undertake gas filtration safely and efficiently by applying process knowledge and equipment knowledge</td>
<td></td>
</tr>
<tr>
<td>2. Undertake and monitor the filtration process</td>
<td>2.1 Monitor process systems to ensure that product specifications are maintained</td>
</tr>
<tr>
<td>2.2 Monitor and maintain filtration equipment within agreed operating parameters</td>
<td></td>
</tr>
<tr>
<td>2.3 Select the appropriate filtration units or the appropriate number of units to ensure product specifications are met</td>
<td></td>
</tr>
<tr>
<td>2.4 Maintain liaison with outside operators throughout the process so appropriate field adjustments of identified operating equipment are made</td>
<td></td>
</tr>
<tr>
<td>2.5 Ensure that filtration equipment is isolated to allow element change-out and maintenance as appropriate</td>
<td></td>
</tr>
<tr>
<td>3. Record process variations</td>
<td>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</td>
</tr>
<tr>
<td>3.2 Arrange required maintenance of operational equipment and communicate to appropriate personnel</td>
<td></td>
</tr>
</tbody>
</table>
**RANGE OF VARIABLES:**

**Context:**
Filtration equipment and systems may include:
- screens
- strainers
- filters
- coalescers
- membranes
- scrubbers
- knock-out pots
- cyclone filters
- liquid drain/dump systems
- differential pressure monitoring equipment

and may be associated with:
- Joule-Thompson processes
- gas pre-treatment systems.

This competency would be undertaken within a team environment and in conjunction with the overall control of the product being produced.

All operations are performed in accordance with standard operating procedures.

Relevant legislative and environmental requirements and applicable site or enterprise safety and environmental policies and procedures, including the permit to work System, must be adhered to.

**OH&S:**
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.
Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency can be assessed in either a workplace or simulated environment, using a range of process equipment, control systems and mechanisms.

It is expected that a person undertaking this competency would be able to demonstrate the required competencies to control the production process, to identify and correct product deviations and to recognise product hazards in a safe and systematic manner.

A person undertaking this competency must be able to work under and manage situations of high pressure. An ability to both be able to work with others in a team environment and demonstrate the flexibility to work largely unsupervised, as well as to direct or assist other operators both with a control and plant environment, is highly desirable.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD203A Operate and monitor valve systems.

Individual enterprises may choose to add other prerequisites relevant to their process.
**Essential Knowledge:**

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

- architecture of the process/production system
- the plant
- product tolerances, limitations and specifications
- systems operating parameters
- industry entry level physics and chemistry
- process control philosophies and strategies
- the process
- stabilisation principles
- outside process/production operational knowledge, including expanders, exchangers, compressors and fans
- other process equipment, including valves.
- alarm systems
- communication systems
- latent heat theory
- Joules Thomson principles
- auto refrigeration principles
- cryogenic operations
- refrigerant types.

**Assessment Method, Context and Resource Implications:**

Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

*Undertake Storage, Loading And Transfer Of Product (PMA HYD 311 A)*

UNIT DESCRIPTOR:

This competency covers the storage, loading and transfer of liquid petroleum products in a field or production operation.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Process product           | 1.1 Transfer or divert product from wellhead to wash and test tanks in order to undertake product separation processes  
1.2 Select required chemical testing or applications to separate the product  
1.3 Check tank capacities and loading holdings to ensure sufficient room to store the product                                                                                                                                                                                                |
| 2. Monitor separation of     | 2.1 Apply chemical applications to assist in product separation, ensuring all waste water is drained to the nominated interceptor pond and excess gas is vented to the atmosphere or flare  
2.2 Monitor chemical rates to allow the product to be safely and efficiently separated prior to transfer to storage or production tanks  
2.3 Undertake oil recovery of product carryover prior to product being transferred to nominated evaporation ponds                                                                                                                                               |
| product                      |                                                                                                                                                                                                                                                                                                                                                      |
| 3. Store product            | 3.1 Transfer separated product from wash or test tanks to production tanks prior to trucking or further transfer  
3.2 Dip tanks in order to determine H₂O cut and oil production rates  
3.3 Monitor tank volumes and capacities to ensure that tanks are kept within optimal storage limits and levels, and that product overfills and flows are averted                                                                                                                                                          |
| 4. Transfer product         | 4.1 Complete all required custody transfer paperwork and documentation prior to the product being transferred downstream  
4.2 Utilise appropriate transfer medium to move the product from the field location to nominated downstream location  
4.3 Control and monitor loading rates of the product during the transfer process  
4.4 Monitor operational integrity of equipment used in the transfer process to ensure the product is transferred safely and within stated environmental requirements |
RANGE OF VARIABLES:

Context:
Storage, loading and transfer equipment may include:
- Valves
- Pumps
- Prime movers
- Instrument systems
- Pipelines/trunklines
- road tankers and fixed tanks
- wash tanks, testing tanks, production tanks
- storage vessels
- static electricity earthing
- Storage tanks, ponds and dams
- chemical applications and techniques.

This unit covers small scale or remote storage and transfer of product. For large scale storage and transfer, see unit Hydrocarbons 313: Store and transfer bulk product.

Relevant site specific safety requirements; and specific legislative environmental and site specific environmental management policies and procedures, must be adhered to.

All operations are performed in accordance with standard operating procedures.

A demonstrated knowledge of the Work Permit system is essential so as to ensure all required safety requirements are met and addressed appropriately.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

The application of appropriate local knowledge concerning the safe storage, loading, disposal and transfer of product within stated and enterprise specific environmental procedures and requirements is required.

A knowledge of pond management techniques is required to be demonstrated in order to ensure the safe recovery and disposal of oil waste products.

An ability to interpret and calculate production figures and targets and apply this information to all required and identified competencies within the unit is required. This skill should also be combined with an ability to correlate and communicate selected data to other services or work groups.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

**Assessment Focus:**

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**EVIDENCE GUIDE:**

**Critical Aspects:**

It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

An ability to work within both a team and an individual environment is required.

The permit to work system must be adhered to.
Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD201A Operate and monitor prime movers
- PMAHYD202A Operate and monitor pumping systems and equipment
- PMAHYD203A Operate and monitor valve systems.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Demonstration of competence in this unit must include local knowledge of the following:
- specific operational requirements
- the effect of specific climatic and environmental factors
- water testing and gas breakthrough testing techniques
- atmospheric release
- damming and pond management.
- pumping efficiencies
- production volumes
- product capacities
- ullage rates
- production rates
- chemical reaction rates
- evaporation rates
- separation techniques
- tank dipping and measurement techniques.

A knowledge of pond management techniques is required to be demonstrated in order to ensure the safe recovery and disposal of oil waste products.

An ability to interpret and calculate production figures and targets is required. This skill should also be combined with an ability to correlate and communicate selected data to other services or work groups.
**Assessment Method, Context and Resource Implications:**

Competency should be assessed in a production or field environment involving both the selection and utilisation of a range of tools, testing and operational equipment required to conduct the storage, loading and transfer of the product. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

Persons undertaking this competency must be able to work largely unsupervised, and possess the capacity to organise their own workflows and schedules in accordance with production demands and requirements.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Undertake Ship Loading/Unloading Operations (PMA HYD 312 A)*

**UNIT DESCRIPTOR:**
This competency covers the transfer and loading of hydrocarbons and chemical products from shore based storage facilities to offshore transport.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| **1. Prepare for ship transfer (unloading/loading) of product as required** | 1.1 Make checks to ensure that the vessel is ready for product transfer (eg, ready for transfer, secured and properly moored) prior to the transfer commencing  
1.2 Activate/bring on line all safety systems as required to protect the vessel and personnel during loading (eg, deluge, fire protection)  
1.3 Take actions necessary to ensure all operational conditions for transfer of product are satisfied (eg, connect and initiate loading pumps and arms/hoses) |
| **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 Maintain communication between the vessel and plant control facilities to determine the progress of the transfer, and of tank levels and volumes, as well as to identify any potential hazards during the transfer process  
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 conditions require |
| **3. Complete transfer process** | 3.1 Achieve or satisfy capacities and transfer requirements within the stated allowable timeframes and schedules  
3.2 Retrieve batching pigs as required  
3.3 Decommission, isolate and disengage; or engage transfer pumps and arms/hoses from or to the vessel prior to the vessel's departure 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 Compile and complete all required logs and documentation during the transfer process and communicate the results of the transfer to the appropriate personnel and operational sections  
3.6 Shut down and bring transfer facilities off line ensuring that the area has been made safe after the transfer has been completed |
RANGE OF VARIABLES:

Context:
Work conducted may be undertaken within either a team or individual environment.

Loading equipment may include:
- loading pumps
- loading arms
- gantries
- fire extinguishers, hoses and jets
- mooring lines
- compressors
- storage tanks
- pipelines and trunklines
- pig launcher, pig trap, batching pigs.

Communications systems may include:
- shore to ship and ship to shore
- loading control to process control
- emergency and fire systems.

Jetty operations may include:
- crane operations
- mooring and let-go operations
- product transfer & recovery.

This unit applies to products such as LNG, LPG, oil and chemicals

All operations are performed in accordance with standard operating procedures.

Relevant site specific safety procedures and policies are to be applied.

Loading will be conducted within the allowable weather conditions or restrictions.

The application of specific legislative environmental and site specific environmental management policies and procedures is essential.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

**Assessment Focus:**

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

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**EVIDENCE GUIDE:**

**Critical Aspects:**

It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency should be assessed in the workplace utilising a range of the required tools and equipment and within the stated conditions noted in the range statement. It would be expected that a person undertaking this competency would be competent to operate a range of emergency and/or fire equipment and control situations which may occur during the loading/transfer process.

The person undertaking this competency should be able to demonstrate an ability to effectively communicate and work with a range of service groups and clients, which may include vessel staff, control operators, outside operators and maintenance operations. In addition, the person undertaking this competency should be able to work within a context of minimum supervision or contact.
Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD201A Operate and monitor prime movers
- PMAHYD203A Operate and monitor valve systems
- PMAHYD202A Operate and monitor pumping systems and equipment, and/or
- PMAHYD314A Operate and monitor compressor systems and equipment.
Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following:
- pumps
- motors
- compressors
- fire systems
- communication systems
- tank capacities and volumes
- loading rates.
Knowledge of storage and product transfer techniques and mediums should be demonstrated including things like:
- tank certificates, tank strapping charts
- tank capacities, volumes, temperatures, densities
- pig launch and recovery
- sampling of material
- enterprise transfer procedures, records and ‘paper work’ (including electronic)
- ability to calculate volumes using tank strapping charts to identify opening and closing gauges
as required by enterprise procedures.

A demonstrated knowledge and application of the permit to work system is expected.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Store And Transfer Bulk Product*  *(PMA HYD 313 A)*

**UNIT DESCRIPTOR:**
This competency covers the storage and transfer of bulk hydrocarbon product in a tank farm environment, including liquefied gasses and crude loadout.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepare storage facilities</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1</td>
<td>Manage products within the tank farm in accordance with the site/enterprise's storage types, products and locations</td>
</tr>
<tr>
<td>1.2</td>
<td>Monitor and inspect storage facilities to ensure that they are free from product or vapour leakages, and that their storage integrity, including capacities and condition, are being maintained within agreed parameters</td>
</tr>
<tr>
<td>1.3</td>
<td>Check and test fire protection and deluge systems to verify their operational condition and status, and determine what corrective actions may need to be taken to rectify any identified equipment failures</td>
</tr>
<tr>
<td>1.4</td>
<td>Conduct general housekeeping of storage and tank farms to ensure that these areas are kept free of any foreign matter or hazards which may affect the integrity of the storage facilities and associated equipment</td>
</tr>
<tr>
<td>1.5</td>
<td>Record and communicate identified maintenance requirements to control or maintenance operations for further response and action</td>
</tr>
<tr>
<td>2. Monitor storage facilities</td>
<td>2.1 Dip tanks to measure tank mixes, capacities and quality, and determine if these are being maintained within the agreed product requirements prior to transfer</td>
</tr>
<tr>
<td>2.2</td>
<td>Monitor gas detection systems to ensure that the storage area is maintained safely and in a gas free environment to ensure the product is being safely stored</td>
</tr>
<tr>
<td>2.3</td>
<td>Communicate storage conditions to control or other personnel to inform them of the operational condition and status of the storage facilities</td>
</tr>
<tr>
<td>3. Conduct product loadout</td>
<td>3.1 Liaise with control operations prior to product loadout commencing, to ensure that all start-up permissives have been satisfied and product is ready for transfer</td>
</tr>
<tr>
<td>3.2</td>
<td>Monitor load-out pumps to measure product flow, and ensure that flow rates are being maintained within agreed loading capacities; and are adjusted locally or remotely in order to control these rates and flows</td>
</tr>
<tr>
<td>3.3</td>
<td>Monitor load-out pumps’ operational performance to ensure that they operating within their stated operational requirements and are not vibrating excessively</td>
</tr>
<tr>
<td>3.4</td>
<td>Take and recorded product shipping samples during the load-out phase in order to monitor product quality</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
Storage facilitates and storage equipment may include:
- tanks
- vessels
- pumps
- compressors
- gauges
- fire protection and deluge systems
- gas detection systems and equipment
- tank dipping and measurement equipment.

Product may include oil, LPG, LNG, naphtha.

This unit covers large scale central storage and transfer of product. For remote and small scale storage and transfer, see unit PMAHYD311A: Undertake storage, loading and transfer of product.

All operations are performed in accordance with standard operating procedures.

Housekeeping may include removal of rubbish, weeds, spills or leakages of product, equipment or other materials.

Work may be conducted either within a team related work structure or individually.

State, Federal and local or site specific environmental and historical preservation legislative requirements are to be applied and met.

Relevant enterprise specific safety procedures and requirements are also to be applied.

All work conducted is undertaken within the issued permit to work and confined space entry requirements determined by the site/enterprise.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some awareness of the plant’s business goals is needed to inform decision making and action.
**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**EVIDENCE GUIDE:**
**Critical Aspects:**
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency should be assessed within the work environment, utilising a range of those required tools and equipment noted in the range statement. It would also be expected that general purpose tools and testing equipment be used where appropriate within the application of this competency.

The person undertaking this competency should be able to demonstrate an ability to both effectively and concisely communicate with production, process and maintenance work units across a range of contexts and issues. In addition to this requirement, the person should also be capable of working with a minimum of direct supervision or contact and within a team environment when required.

**Concurrent Assessment and Prerequisites:**
This unit should be assessed concurrently with or following assessment in:
- PMAHYD201A Operate and monitor prime movers
- PMAHYD203A Operate and monitor valve systems
- PMAHYD202A Operate and monitor pumping systems and equipment and/or
  - PMAHYD314A Operate and monitor compressor systems and equipment.

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following:

- confined space entry and vessel entry requirements and procedures
- 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.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:
Operate And Monitor Compressor Systems And Equipment (PMA HYD 314 A)

UNIT DESCRIPTOR:
This competency covers the operation and monitoring of compression systems and equipment.

**ELEMENT** | **PERFORMANCE CRITERIA**
--- | ---
1. Start up compression systems/equipment
   1.1 Seek the status of the system/equipment through communication with control room operations/personnel prior to commencing start-up process
   1.2 Check all required auxiliary systems, including oil and water, to confirm their operational condition
   1.3 Activate and engage switching systems in either a manual to auxiliary status or vice versa or as required, to bring the system/equipment on line safely
2. Bring unit on line and monitor performance
   2.1 Initiate load-up of the system/equipment through the selection of appropriate equipment operational speed or cycle
   2.2 Monitor equipment deviations downstream of the compressor system/equipment to ensure that they do not affect or inhibit the compressor systems/equipment's operation, and are adjusted as required
   2.3 Monitor the operational condition and safety status of the unit through the interpretation of gauges and panel indicators measuring levels, temperatures and flows
   2.4 Adjust operational speeds and operating cycles to avoid operational surges and excessive vibration occurring in the system /equipment which may affect its operational integrity
   2.5 Monitor or activate safety systems to ensure that any system shutdowns are controlled and conducted both safely and effectively
   2.6 Conduct fault finding and troubleshooting of operational systems/equipment to determine and identify any repairs or maintenance requirements which may need to be undertaken or communicated to other personnel or service groups
3. Shut down compressor systems/equipment
   3.1 Confirm cause of shutdown with other personnel and plant operators before commencing to isolate or shut down the equipment/system
   3.2 Implement control measures to ensure that the likelihood of system/equipment damage is reduced or eliminated and that no further operational hazards may occur
   3.3 Make inspections of 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
   3.4 Safely isolate, purge and prepare systems/equipment for identified repair or maintenance, ensure the issued permit to work required to effect this action
RANGE OF VARIABLES:

Context:
Compressor systems and equipment may include:
- single/multi-stage axial flow compressors
- single/multi-stage reciprocating compressors
- turbo expanders/compressors
- lube oil pumps
- seal oil pumps
- coolers
- scrubbers
- expanders
- anti-surge systems
- vibration monitoring systems
- safety systems
- power supply systems
- appropriate hand tools and equipment
- compressor control systems
- programmable logic controllers (PLCs)
- process controllers.

All operations are performed in accordance with standard operating procedures.

Work may be undertaken in either a team or individual context.

Enterprise specific maintenance or servicing schedules or requirements must be met.

Relevant legislative and enterprise OH&S and safety requirements and procedures apply. Appropriate safety equipment and clothing must be utilised.

Use and operation of personal computers, other hardware mediums and associated software is involved.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This unit may be assessed either in the workplace or within a simulated environment, and can be applied to a range of compressor systems and equipment, operational conditions and requirements and associated production/process equipment.

Persons undertaking this competency would do so as a normal part of their work duties and responsibilities, and would not normally be considered to be specialist repairers or maintainers of production/process equipment or systems.

It is expected that persons undertaking this competency would be able to demonstrate an ability to read, analyse or interpret data from control panels, gauges and other forms of measuring devices in order to determine and control the operating condition and integrity of the compression systems/equipment they may be operating with, and thus be able to demonstrate fault finding techniques, fault diagnosis and troubleshooting techniques.

This competency would normally be undertaken within the context of limited supervision or direction.
Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD201A Operate and monitor prime movers
- PMAHYD203A Operate and monitor valve systems
- PMAHYD333A Monitor and maintain electrical systems.

Individual enterprises may choose to add other prerequisites relevant to their process. The number will vary due to the range of operating requirements and locations of the enterprise.

All work conducted is undertaken within the stated requirements of the permit to work system.

Essential Knowledge:
Demonstration of competence in this unit must include knowledge of the following
- power & torque envelopes
- compression flows and characteristics
- liquid and product separation principles
- speed and capacity control curves, including speed relationships and consequences
- plant and field operational requirements
- field and plant geography
- product characteristics and tolerances
- equipment operational parameters
- flow charts and liquids
- pressure levels and rates.
- P&IDs.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

**Lead Fire Emergency Teams (PMA HYD 315 A)**

UNIT DESCRIPTOR:
This unit of competency is designed to allow an individual to lead and co-ordinate a fire emergency team, including deployment of resources at the scene of a fire emergency.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</thead>
</table>
| 1. Assess the nature and extent of the emergency | Demonstrates the ability to:  
1.1 Determine the nature and extent of the fire emergency in order to ascertain the level and degree of the emergency and what required actions and management strategies should be implemented  
1.2 Communicate the nature and extent of the fire emergency in a timely and appropriate manner to other nominated emergency or facility personnel  
1.3 Facilitate the rescue of personnel at risk, control/extinguish the fire and to make the affected area safe through application of rescue and fire control strategies  
1.4 Ensure all team members are adequately instructed, protected and equipped to function safely and effectively in the emergency situation through the application of personal protective equipment |
| 2. Effect rescue of personnel at risk |  
2.1 Instruct rescue teams to effect the search for, and rescue of, personnel identified as being at risk  
2.2 Allocate resources to potentially exposed or threatened personnel and assets, and minimise the likelihood of escalation of the risk |
| 3. Confine the spread of fire emergency |  
3.1 Initiate extinguishing responses promptly in order to extinguish the fire emergency  
3.2 Render affected areas safe in order to prevent the likelihood of further reignition, or threat to personnel or assets  
3.3 Provide feedback to facility or other nominated personnel concerning the status of the emergency |
RANGE STATEMENT:
This unit of competency would be applied by those persons who are permanently or regularly assigned to any of the following installations or facilities and lead an emergency response team:

- onshore/offshore rig/installation
- island based facility
- floating production vessel
- onshore production, processing and/or storage facilities.

Equipment may include:

- fire extinguishing agents and water curtains
- hoses
- mobile extinguishers
- stretchers
- personal protective equipment
- SCBA
- communication equipment.

Relevant facility fire management and safety systems include:

- fire management systems
- communication systems
- relevant facility emergency management and contingency response plans.

Relevant legislative and safety case management principles and agreements must be adhered to.

An ability to lead in a team is required.
EVIDENCE GUIDE:

Context:
This unit may apply to any person who normally operates or is based on an onshore or offshore facility or installation.

This skills and knowledge contained within this unit of competency could be utilised as a normal part of a person’s responsibilities and duties. A person undertaking this unit of competency would be normally nominated to assume the responsibility of emergency team leader.

Critical Aspects:
The person undertaking this competency must be able to work within an environment which requires a high level of teamwork, leadership and interpersonal communication. This person should be able to respond to directives given by the incident controller and to cooperate with other team leaders in order to contain and control the emergency.

It is expected that a person undertaking this unit of competency would be able to demonstrate the use and application of a range of firefighting and rescue equipment, protective clothing and self contained breathing apparatus. The person would also demonstrate the site specific alarm and emergency response procedures.

Concurrent Assessment and Prerequisites:
It would be expected that a person undertaking this competency would have completed or be able to demonstrate competence in the following unit of competency before undertaking this unit:
- PMAHYD207A Respond to fire and smoke incidents
- PMAHYD208A Fire control and emergency rescue.

Essential Knowledge:
A person undertaking this competency must be able to demonstrate a knowledge of:
- Characteristics of fires and fuel types
- Principles and procedures of SCBA
- Search and rescue techniques (other than self)
- Relevant facility fire management and safety systems
- Communication systems
- Emergency response plans
- Teamwork principles and techniques.
### Essential Skills:
A person undertaking this competency must be able to demonstrate:
- use and selection of personal protection equipment
- fire control and attack techniques and strategies
- selection and application of appropriate fire extinguishing media
- self rescue techniques
- casualty handling techniques.

### Resource Implications:
Standard resources & equipment found in the workplace should be used for the demonstration of competence.

### Context of Assessment:
Competency may be demonstrated within a simulated context or in the workplace.
**UNIT TITLE:**

*Command The Operation Of Survival Craft (PMA HYD 316 A)*

**UNIT DESCRIPTOR:**
This unit of competency refers to the operation and control of totally enclosed motor propelled survival craft (TEMPSC).

<table>
<thead>
<tr>
<th>ELEMENT</th>
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</thead>
</table>
| **1. Control muster** | 1.1 Convey information from the control centre concerning the nature and scope of the emergency  
1.2 Confirm and verify personnel gathered at the muster point against current person-on-board lists  
1.3 Confirm personnel and craft readiness status with the incident controller  
1.4 Maintain control of the muster point in order to ensure that an orderly and safe evacuation is achieved |
| **2. Conduct organised deployment of TEMPSC** | 2.1 Direct mustered personnel, either on the order to abandon, or alternatively if circumstances necessitate abandonment, to board the craft in accordance with the site requirements and agreed operating procedures  
2.2 Check all personnel to ensure that they are safely secured within craft and all required safety equipment has been verified as operational prior to launch  
2.3 Launch craft by appropriate procedure, ensuring the safety of all personnel is maintained during the launch  
2.4 Manoeuvre the launched craft away from the facility/installation to a predetermined location, safe holding area or distance  
2.5 Utilise all equipment to assist in the safe operation of the craft  
2.6 Communicate with nominated agencies and services in order to convey the position and condition of craft and personnel and to assist in the recovery of the craft |
| **3. Provide leadership in TEMPSC deployment of welfare and personnel** | 3.1 Communicate with other survival craft and base station in order to facilitate self rescue and recovery of others in the affected area  
3.2 Prepare craft and personnel for safe recovery by the appropriate methods |
RANGE OF VARIABLES:

This unit of competency could be applied to those persons who would normally operate or command a survival craft as a part of their work responsibilities or duties.

This unit of competency should only be applied to those persons who regularly travel to any of the following installation or facilities:

- offshore rig/installation
- floating production platform.

Craft will be operated within a range of weather conditions.

Emergency response plans apply.

Craft handling procedures and techniques must be understood and applied.

Launch types may include:

- davit - single fall
- davit - double fall
- freefall.

Procedures for loss of command situations must be understood.

An ability to work in a team or individual context is required.
Evidence Guide:
Critical aspects of evidence to be considered:
Persons undertaking this competency would be expected to control TEMPSCs as a part of their normal duties and responsibilities within an offshore facility or installation. These persons would normally be either permanently or regularly assigned to an offshore installation or facility. It is critical that a person undertaking this unit of competency demonstrate the use of the following procedures and knowledge:
- emergency response plans and procedures
- evacuation procedures and alarms
- facility or installation layout
- safety equipment and survival craft locations (TEMPSC)
- communication techniques and procedures
- craft handling techniques
- mustering and control techniques
- emergency craft equipment operation
- emergency craft equipment operation
- command techniques and procedures.

Concurrent Assessment and Prerequisites:
It would be expected that a person undertaking this unit of competency would be able to demonstrate all aspects of the following:
- the launching, handling and recovery of survival craft
- the operation of survival craft in all types of weather conditions
- the operation of all equipment normally contained within a survival craft.

Essential Knowledge:
A person undertaking this competency should be able to demonstrate a knowledge of:
- emergency response plans and procedures
- evacuation procedures and alarms
- facility or installation layout
- safety equipment and survival craft locations (TEMPSC).

Essential Skills:
A person undertaking this unit of competency would be able to demonstrate safe operation and command of relevant survival equipment and the use and application of associated equipment including:
- launch and retrieval systems
- control, mustering and boarding procedures and systems
- communication systems.

Resource Implications:
Standard resources and equipment found in the workplace should be used for the demonstration of competence.

Context of Assessment:
This unit of competency could be assessed and demonstrated in a simulated environment using survival craft and launching systems relevant to the particular facility/installation.
## UNIT TITLE:

*Communicate Pipeline Control Centre Operations (PMA HYD 330 A)*

## UNIT DESCRIPTOR:

This unit relates to the communication of Pipeline Control Centre operations in order to achieve a safe and controlled working environment.

### ELEMENT PERFORMANCE CRITERIA

1. **Communicate operation needs**
   - **1.1** Respond and record messages and information received from field operations and pipeline system stations
   - **1.2** Monitor and convey information concerning the operation of the pipeline system to relevant personnel and other work areas to ensure safe and efficient operation of the pipeline system
   - **1.3** Clarify additional information needs and select an appropriate communication medium to deliver the information required
   - **1.4** Improve operational efficiency through adequate and timely application of information provided
   - **1.5** Interpret and action customer/shipper gas forecasts to ensure correct gas flow rates into the pipeline system are achieved

2. **Undertake pipeline system orientation**
   - **2.1** Ensure the pipeline system functions within the design parameters by application of pipeline system operation and design philosophy
   - **2.2** Interpret and apply process information drawings to the operation of the pipeline system and associated facilities
   - **2.3** Apply knowledge of the pipeline operating principles, parameters and product specifications to the control and operation of the pipeline system and associated facilities
   - **2.4** Source and interpret relevant workplace documentation in order to allow familiarisation with the pipeline system operating principles and parameters

3. **Monitor field and pipeline station operation**
   - **3.1** Monitor and observe equipment operating conditions, pressures and temperatures to determine if the correct operating parameters of the equipment is being maintained
   - **3.2** Identify faults and initiate the required repair or reporting of the fault in order to rectify the fault
   - **3.3** Record and monitor field personnel movements to ensure safety of all personnel in the field
   - **3.4** Authorise, record and monitor permits to work to allow operational activities to be undertaken or cancelled
| 4. Shut down pipeline system | 4.1 Apply emergency shutdown procedures in the event of serious equipment failure or operational parameters being exceeded  
4.2 Complete shutdown in accordance with operating conditions  
4.3 Perform shift hand over procedures  
4.4 Complete and document pre-shutdown checks  
4.5 Interpret and maintain records and reports |
|---|---|
| 5. Respond to system alarms and emergencies | 5.1 Interpret and acknowledge alarm codes correctly to ensure the correct response strategy is selected and applied to the situation  
5.2 Evaluate internal messages and response communications concerning system alarms/incidents to establish the scope and severity  
5.3 Determine the required course of action or emergency response in order to control the identified system condition/emergency and prevent further risk of product supply, personal injury, equipment or environmental damage by selecting from company operational/emergency procedures |
| 6. Restore safe operating conditions | 6.1 Isolate identified faults and relay the information to technicians and other services/parties in order for fault finding or safety checks to be conducted to identify risks to product supply, pipeline equipment, environment and personnel  
6.2 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  
6.3 Conduct and undertake all identified maintenance in compliance with the permit to work system and administer to ensure that all work complies with all issued permits |
**RANGE OF VARIABLES:**

**Context:**
This competency can be applied to the use of pipeline SCADA systems and the operational activities at pipeline control centres.

Control systems may include:
- fire and gas extinguishing and deluge systems
- emergency systems
- alarm systems
- communication systems
- utilities
- SCADA.

Drawings and schematics may include:
- P&IDs and other forms of engineering drawings or process schematics
- geographical and topographical maps
- alignment drawings.

Liaison with third parties may include:
- producers, shippers, customers
- government bodies
- contractors
- landowners.

Pipeline system equipment may include:
- heaters, furnaces and exchangers
- station instrumentation
- station power supplies
- metering equipment
- process control equipment
- gas analysis equipment
- valves, actuators and flanges
- piping systems
- sumps and drains
- pressure vessels/filtration equipment
- compressors and prime movers
- cathodic protection systems.
Reports may include:
- routine inspections, ie, daily readings, monthly checks
- scheduled maintenance activities
- mandatory inspections
- statutory inspections
- hazard and incident reports
- customer/shipper gas flow rate forecasts
- pipeline operational trends.

**OH&S:**

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- the permit to work system
- company emergency procedures and plans
- use and operation of personal computers, other hardware mediums and associated software
- use of global positioning systems (GPS)
- interpretation of gas contract agreements with shippers/customers.

**Assessment Focus:**

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
**EVIDENCE GUIDE:**

**Critical Aspects:**

It is expected that a person undertaking this competency should be able to demonstrate a working knowledge of the pipeline or associated facilities specific permit requirements and permit system or administration.

It is expected that a person undertaking this competency would have operated the pipelines specific control/SCADA system.

The ability of the person undertaking this competency to work under and manage situations of high pressure is desirable, in order to ensure the safe and efficient management of the control room and pipeline system is maintained and the safety of pipeline system employees is assured.

**Concurrent Assessment and Prerequisites:**

This unit should be assessed concurrently with or following assessment in:

- PMAHYD209A Monitor the permit to work
- PMAHYD238A Undertake first response to pipeline incidents
- PMAHYD230A Operate/monitor/maintain pipeline facilities/equipment.

Individual enterprises may choose to add other prerequisites relevant to their process.

**Essential Knowledge:**

A demonstration of related knowledge and applications would be considered critical in underpinning this unit. This may include:

- SCADA systems
- alarm systems
- emergency systems, including fire and shutdown
- communication systems, including radio, faxes and telephone
- personal computers.

A demonstrated knowledge of specific equipment and systems including:

- permit to work system
- architecture of the pipeline system
- plant and piping knowledge
- pipeline system operating parameters
- process control philosophies and equipment operation
- gas analysis equipment operation
- MSDS information
- job hazard analysis.
An understanding of how to communicate with a variety of areas both internally and externally to the pipeline system and process and the choice of the appropriate medium to conduct this communication is an essential component of this competency.

An ability to co-ordinate with other work groups and a demonstrated knowledge of the inter-relationships within the pipeline system in order to manage any given situation would be considered as being an essential component of this unit of competency.

**Assessment Method, Context and Resource Implications:**

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Conduct Pipeline Pigging (PMA HYD 331 A)

UNIT DESCRIPTOR:
This unit refers to pipeline pigging operations carried out to maintain the pipeline system integrity.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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| 1. Prepare the pipeline system for pigging | Demonstrates the ability to:  
1.1 Liaise with the Pipeline Control Centre to ensure correct flow conditions are in the pipeline system prior to launching  
1.2 Verify that the permit to work has been issued to cover the required work  
1.3 Prepare pig in accordance with manufacturer’s specifications  
1.4 Prepare pipeline for “pigging” operation in accordance with legislative and enterprise requirements |
| 2. Launch, monitor and receive pig | 2.1 Prepare launching and receiving scraper barrels and, intermediate site for launching and receiving operations  
2.2 Load the pig into the scraper barrel and launch  
2.3 Calculate pig travel speed during the pigs progress  
2.4 Monitor and track progress of the pig in the pipeline system to ensure pig is not lost or becomes stuck  
2.5 Adopt remedial actions or emergency response procedures to rectify any identified faults |
| 3. Interpret pigging data | 3.1 Inspect the received pig to determine the wear sustained to the pig material  
3.2 Measure the quantity and weight of waste material gathered during pigging operation and collect a sample for analysis to determine pipeline conditions  
3.3 Dispose of waste materials as per the appropriate company procedure  
3.4 Record data accurately to assist with assessment of pipeline condition |
RANGE OF VARIABLES:

Context:

Pigs may include:
- batching pigs
- cleaning pigs
- foam pigs
- brush pigs
- disc pigs
- cup pigs.

Waste materials may include:
- condensate
- water
- lubricants
- oils
- dust and iron oxide particles.

OH&S:

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

Knowledge and Enterprise Requirements:

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- the permit to work system
- job hazard analysis
- pig travel speed calculation formulas
- pipeline drawings such as P&IDs
- use and operation of personal computers, other hardware mediums and associated software.
Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is expected that a person undertaking this unit would be able to demonstrate the use and operation of range of pigs and pigging techniques.

It is essential that a person undertaking this unit of competency be able to calculate and measure the results achieved through the completion of the pigging activities and recommend a course of remedial action to be undertaken.

An ability to coordinate own and the work of others including on site contractors and other third party operators is required as an essential component of this competency.

A person undertaking this unit of competency must ensure that all pigging operations conducted are undertaken within the stated permit to work requirements issues for the operation and within agreed legislative and company safety and environmental requirements.

It is expected that a person undertaking this competency demonstrates an awareness of all site specific safety and environmental requirements and an ability to apply the permit to work system within the context of this unit.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD236A Operate vehicles in the field.

Individual enterprises may choose to add other prerequisites relevant to their process.
**Essential Knowledge:**

A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

It is essential that a person undertaking this competency demonstrates an ability to interpret a range of data and information including waste materials measurement and pig condition to ensure that the correct/required gas flows within the pipe are being maintained within specification and standard.

A person undertaking this unit must be able to demonstrate the knowledge and application of the following equipment:

- batching pigs
- cleaning pigs
- foam pigs
- brush pigs
- disc pigs
- cup pigs.

**Assessment Method, Context and Resource Implications:**

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
### UNIT TITLE:

Monitor And Maintain Instrument And Control Systems (PMA HYD 332 A)

### UNIT DESCRIPTOR:

This unit refers to the monitoring and maintenance of instrument/electrical systems utilised for process measurement and control of hydrocarbon products.

### ELEMENT | PERFORMANCE CRITERIA
--- | ---
1. Monitor equipment operation | Demonstrates the ability to:

1.1 Management equipment according to instrument/electrical equipment operating principles and parameters

1.2 Access and interpret relevant technical drawings and schematics in order to determine system faults

1.3 Issue permit to work to allow work to be undertaken

1.4 Verify equipment operation performance through test procedures to ensure correct operation and confirm identified problem from other sources

1.5 Correct and document operational variations through calibration and adjustment

2. Test/repair equipment | 2.1 Verify equipment is operating correctly and document test results

2.2 Apply fault finding and troubleshooting techniques to operational faults that have been detected and rectify through applying maintenance procedures

2.3 Isolate, remove and dispose of faulty equipment, and install new equipment

2.4 Verify installed equipment to ensure it meets required operational parameters and conditions

2.5 Record all repairs/installations to provide historical records of the condition of system equipment

3. Recommission systems and equipment | 3.1 Bring repaired/installed equipment back on line at the desired operational parameters and sequence

3.2 Monitor or activate systems to ensure the systems are operating both safely and effectively

3.3 Close out permit to work and restore site/system to normal operation

4. Compile and analyse reports | 4.1 Collect information concerning deviations, repaired equipment and put into accepted reporting format

4.2 Compile reports ensuring that they provide an accurate and ongoing record of deviations in pipeline processes and a current record of pipeline and equipment trends

4.3 Utilise information or reports for short and long term deviation control planning
RANGE OF VARIABLES:
Context:
Pipeline control systems include:
- compressor systems and equipment (compressors, monitoring systems, power supply systems, pumps, coolers, scrubbers, expanders, anti surge systems, safety systems and compressor control systems)
- prime movers may include turbine engines, reciprocating engines, electric motors (fuel and carburettion systems, ignition systems, lubrication systems, induction and exhaust systems, governing systems, power supply systems, safety and shutdown systems)
- instrument and control system, (flow control equipment, pressure and temperature transmitters and transducers, telemetry equipment, gas chromatographs, moisture analysers, gas sampling equipment, PLCs, flow computers, electro/pneumatic control equipment, etc)
- valve system (non-control valves, control and shut off valves, non-return or check valves and pressure relief valves, manual hand operated actuator, gas/hydraulic actuator and pneumatic valves).

Emergency responses include:
- gas leaks and fire
- equipment failure
- hazards and incidents.

Relevant personnel may include:
- supervisors
- maintenance personnel
- organisation employees
- contractors
- government bodies.

Types of faults may include:
- gas leaks
- electrical problems
- compressor or pump failure
- out of current inspection status
- gauge failure or hose rupture/leaks
- instruments out of calibration
- non-flow of gas
- instruments and equipment requiring cleaning.
Reports may include:
- routine inspections (daily readings, monthly checks)
- scheduled maintenance activities
- mandatory or statutory inspections
- hazard and incident reports
- quality assurance system requirements/reports.

Instrument/electrical systems may include:
- process analysing systems, ie, gas analysis
- emergency shutdown systems
- fire systems
- pressure and temperature control systems
- metering systems, ie, orifice, turbine, positive displacement
- telemetry and SCADA systems
- communications systems
- solar systems
- utility systems.

Test equipment and tools may include:
- dead weight tester
- transmission unit
- ice point tester
- decade box
- multimeter
- RTD calibrator
- chart recorders
- data logging equipment
- hand tools
- valves, actuators and flanges
- heaters and heat exchangers
- metering equipment
- process control equipment
- gas analysis equipment
- piping systems
- sumps and drains
- pressure vessels/filtration equipment
- prime movers
- pumping systems and equipment
- compression systems and equipment
- pig.

The use and operation of personal computers, other hardware mediums and associated software is required.
**OH&S:**

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work
- job hazard analysis.

**Assessment Focus:**

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
Critical Aspects:
It is expected that a person undertaking this competency demonstrates an awareness of all site specific safety and environmental requirements and an ability to apply the permit to work system within the context of this unit.

It essential that a person undertaking this competency demonstrate an ability to interpret a range of process and system control drawings and schematics in order to undertake the required or identified repairs/modifications to instrument control systems.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD330A Communicate pipeline control centre operations
- PMAHYD310A Produce product – filtration
- PMAHYD309A Produce product – liquid extraction
- PMAHYD201A Operate and monitor prime movers
- PMAHYD202A Operate and monitor pumping systems and equipment
- PMAHYD314A Operate & monitor compression systems & equipment
- PMAHYD203A Operate and monitor valve systems
- PMAHYD230A Operate/monitor/maintain pipeline facilities/equipment
- PMAHYD333A Monitor and maintain electrical systems.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

A person undertaking this unit must be able to demonstrate the knowledge and application of the following range of testing equipment:
- dead weight tester
- transmission unit
- ice point tester
- decade box
- Multimeter
- RTD calibrator
- chart recorders
- data logging equipment.

It is expected that a person undertaking this unit would be able to demonstrate a knowledge and ability to test, repair, recommission and monitor the operational condition of instrument control systems utilised within the pipeline industry.
A person undertaking this unit of competency would also be expected to demonstrate an ability to not only maintain these systems but also communicate and report the operational condition and history of instrument control systems to other team members and company personnel.

An ability to coordinate own and the work of others including on site contractors/operators is required as an essential component of this competency.

It is essential that a person be able to apply the underlying skills and knowledge contained within this competency across a range of instrument and electrical systems including:

- process analysing systems, ie, gas analysis
- emergency shutdown systems
- fire systems
- pressure and temperature control systems
- metering systems, ie, orifice, turbine, positive displacement
- telemetry and SCADA systems
- communications systems
- solar systems
- utility systems.

**Assessment Method, Context and Resource Implications:**

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

*Monitor And Maintain Electrical Systems (PMA HYD 333 A)*

## UNIT DESCRIPTOR:
This unit refers to the operation and maintenance of electrical systems and equipment on pipeline systems.

### ELEMENT | PERFORMANCE CRITERIA
--- | ---
1. Monitor equipment operation | 1.1 Management equipment according to electrical equipment operating principles and parameters  
1.2 Access and interpret relevant technical drawings and schematics in order to determine system faults  
1.3 Issue permit to work to allow work to be undertaken  
1.4 Verify equipment operation performance through test procedures to ensure correct operation and seek confirmation of identified problem from other sources  
1.5 Correct and document operational variations through calibration and adjustment

2. Test/repair equipment | 2.1 Verify equipment is operating correctly and document test results ensuring that statutory electrical testing requirements have been completed  
2.2 Apply fault finding and troubleshooting to operational faults that have been detected and rectify through applying maintenance procedures  
2.3 Isolate, remove and dispose of faulty equipment, and install new equipment  
2.4 Verify installed equipment to ensure it meets required operational parameters and conditions  
2.5 Record all repairs/installations to provide historical records of the condition of system equipment

3. Recommission systems and equipment | 3.1 Bring repaired/installed equipment back on line at the desired operational parameters and sequence  
3.2 Monitor or activate systems to ensure the systems are operating both safely and effectively  
3.3 Close out permit to work and restore site/system to normal operation

4. Compile and analyse reports | 4.1 Collect information concerning deviations, repaired equipment, and put into accepted reporting format  
4.2 Compile reports ensuring that they provide an accurate and ongoing record of deviations in pipeline processes and a current record of pipeline and equipment trends  
4.3 Utilise information or reports for short and long-term planning in deviation control
RANGE OF VARIABLES:

Context:

Electrical equipment may include:
- voltage regulating equipment
- battery banks, ie, nicad, lead acid
- solar generating equipment
- alternators, generators and motors
- uninterrupted power supplies (UPS)
- control panels
- lighting
- air conditioning
- power tools and electrical leads
- SWER lines.

Electrical systems may include:
- emergency shutdown systems
- fire systems
- solar systems
- utility systems
- uninterrupted power supply systems
- low voltage power systems
- SWER line systems
- communications systems.

Test equipment may include:
- multimeter
- chart recorders
- data logging equipment
- amp and volt meters
- watt meters
- high voltage testing equipment
- electrical inspection tags.

Applicable Australian standards/legislation relevant to CP system may include:
- OH&S legislation
- utility codes and standards
- AS 2885
- AS 2430 - hazardous areas
- AS 1768
- AS 1596
- AS 1697
- AS 2832.1
- AS 3000
- AS 2239
- AG 603.
The use and operation of personal computers, other hardware mediums and associated software is required.

**OH&S:**
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work
- job hazard analysis
- appropriate hand/power tools and equipment
- relevant authorisation from the electrical governing body for electrical licensing, eg, minimum requirement restricted electrical licence.

**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:
It is expected that a person undertaking this competency demonstrates an awareness of all site specific safety and environmental requirements and an ability to apply the permit to work system within the context of this unit.

It is essential that a person undertaking this competency demonstrates an ability to interpret a range of process and system control drawings and schematics in order to undertake the required or identified repairs/modifications to electrical systems.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD201A Operate and monitor prime movers
- PMAHYD202A Operate and monitor pumping systems and equipment
- PMAHYD314A Operate and monitor compressor systems and equipment
- PMAHYD203A Operate and monitor valve systems
- PMAHYD230A Operate/monitor/maintain pipeline facilities/equipment
- PMAHYD330A Monitor and maintain electrical systems
- PMAHYD334A Monitor & maintain pipeline cathodic protection systems
- PMAHYD332A Monitor and maintain instrument and control systems.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

It is expected that a person undertaking this unit would be able to demonstrate a knowledge and ability to test, repair, recommission and monitor the operational condition of electrical systems utilised within the pipeline industry.

A person undertaking this unit of competency would also be expected to demonstrate an ability to not only maintain these systems but also communicate and report the operational condition and history of electrical systems to other team members and company personnel.

An ability to coordinate own and the work of others including on site contractors/operators is required as an essential component of this competency.
A person undertaking this unit must be able to demonstrate the knowledge and application of the following range of testing equipment:

- multimeter
- chart recorders
- data logging equipment
- amp and volt meters
- watt meters
- high voltage test equipment
- earth leakage test equipment.

It is essential that a person be able to apply the underlying skills and knowledge contained within this competency across a range of electrical systems including:

- emergency shutdown systems
- fire systems
- uninterrupted power supply systems
- communications systems
- solar systems
- utility systems
- low voltage power systems
- SWER lines.

**Assessment Method, Context and Resource Implications:**

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

*Monitor And Maintain Pipeline Cathodic Protection Systems (PMA HYD 334 A)*

## UNIT DESCRIPTOR:

This unit refers to maintenance and monitoring of pipeline cathodic protection systems and routine operations normally conducted on pipeline systems.

## ELEMENT | PERFORMANCE CRITERIA
---|---
1. Monitor, plan and prepare for maintenance activities | Demonstrates the ability to:

1.1 Operate the cathodic protection equipment in accordance with the principles of cathodic protection impressed current/corrosion systems
1.2 Monitor equipment operating parameters to ensure it is operating within specifications of the relevant Australian standard
1.3 Take readings at regular intervals from CP monitoring equipment and galvanic anode beds and interpret collected data
1.4 Identify CP faults and notify appropriate personnel
1.5 Maintain accurate records
1.6 Compile reports based on the collected data and analyse to determine system maintenance and operational adjustments to ensure system integrity

2. Monitor and adjust electrical equipment | 2.1 Maintain CP system at maximum efficiency within design parameters
2.2 Monitor equipment operating parameters to determine if the correct operating conditions of the equipment are being maintained
2.3 Collect and interpret data and determine maintenance requirements
2.4 Conduct regular checks to ensure the integrity of the equipment is maintained and results are recorded and any system abnormalities identified
2.5 Carry out adjustments and maintenance to the equipment where abnormalities in the system have been identified

3. Re-establish system | 3.1 Re-establish system in order to meet pipeline system operational requirements
3.2 Restore site to meet environmental and operational requirements
3.3 Update records and drawings to reflect the repair/modification
3.4 Maintain incident records
| 4. Conduct CP system surveys | 4.1 Interpret survey specifications to determine survey path and equipment requirement  
4.2 Interpret topographical and geographical maps to determine selection and access of pipeline route  
4.3 Undertake the surveillance of the CP system using a suitable vehicle for the terrain  
4.4 Conduct CP surveys of the pipeline system and log and record results of the survey  
4.5 Download collected survey data to allow a report to be compiled concerning survey findings |
| 5. Analyse and utilise CP data | 5.1 Analyse survey report data and findings to determine system abnormalities and maintenance required for the continued operation of the system  
5.2 Repair or modify as required, areas/equipment identified for maintenance  
5.3 Utilise CP data to assist in determining future system and equipment design and construction/manufacture |
### RANGE OF VARIABLES:

**Context:**

Types of CP faults may include:
- coating damage/deterioration
- interference from other systems
- anode not working
- equipment fault/failure.

Applicable Australian Standards/legislation relevant to CP system may include:
- OH&S legislation
- utility codes and standards
- AS 2885
- AS 2430 - hazardous areas
- AS 1768
- AS 1596
- AS 1697
- AS 2832.1
- AS 3000
- AS 2239
- AG 603.

Location for maintaining CP systems may be urban, country or remote. Third party monitoring is required.

Process equipment may include:
- solar powered power generation systems
- 240V power generation systems
- insulation and monolithic joints
- galvanic anode beds
- battery banks – nicad and lead acid
- transformer rectifiers and CPUs
- lightning protection equipment
- CP test points
- Kirk cells.

Installation and operation of CP system interrupters is required for test/survey activities.

Types of surveys and tests may include:
- on potential surveys
- on/off potential surveys
- coating defect assessment surveys, ie, DCVG method, Pearson technique/method, over pipeline potential method
- loop impedance testing
- anode bed testing
- soil resistivity testing
- interference testing.
Test equipment may include:
- reference half cells
- MultiMates
- dataloggers
- trycorders
- syncorders
- interrupters
- costing defect assessment equipment
- soil resistivity test equipment.

**OH&S:**
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work
- job hazard analysis
- The use and operation of personal computers, other hardware mediums and associated software.

**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
Critical Aspects:

It is expected that a person undertaking this competency demonstrates an awareness of all site specific safety and environmental requirements and an ability to apply the permit to work system within the context of this unit.

It essential that a person undertaking this competency demonstrate an ability to interpret a range of cathodic protection data system surveys and readings in order to determine system and equipment abnormalities.

A person undertaking this unit must be able to demonstrate the knowledge and application of a range of topographical, geographical maps and pipeline drawings as a normal part of their data collection and monitoring process.

Concurrent Assessment and Prerequisites:

This unit should be assessed concurrently with or following assessment in:

- PMAHYD333A Monitor and maintain electrical systems
- PMAHYD234A Install cathodic protection systems and equipment
- PMAHYD230A Operate/monitor/maintain pipeline facilities/equipment
- PMAHYD235A Coat pipelines
- PMAHYD236A Operate vehicles in the field.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:

A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

It is expected that a person undertaking this unit would be able to demonstrate a knowledge of cathodic protection systems and cathodic protection equipment. They would also be expected to demonstrate an ability to not only adjust CP systems, but also be able to monitor and adjust related electrical power systems.

An ability to coordinate own and the work of others including on site contractors and other third party operators is required as an essential component of this competency.
A person undertaking this unit of competency would be expected to be able to operate and monitor a range of equipment including:

- solar powered power generation systems
- 240V power generation systems
- insulation and monolithic joints
- galvanic anode beds
- battery banks - nicad and lead acid
- transformer rectifiers and CPUs
- lightning protection equipment
- CP test points

and also be able to undertake a range of tests and surveys including:

- on potential surveys
- on/off potential surveys
- CDA surveys
- loop impedance testing
- anode bed testing
- soil resistivity testing
- interference testing.

**Assessment Method, Context and Resource Implications:**

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Prepare and plan for welding and cutting operations | 1.1 Interpret and check plans, relevant codes and drawings of proposed works  
1.2 Organise equipment and liaise with relevant company personnel and services in order to establish pipeline system conditions and co-ordinate repair/modification activities  
1.3 Convey information concerning the identified repair/modification to all parties concerned with the repair  
1.4 Conduct a welding procedure and welder qualification test to verify the proposed procedure  
1.5 Analyse and verify welding procedure and welder qualification test results, and issue a report to relevant parties |
| 2. Monitor pipe welding, cutting and fabrication | 2.1 Fabricate pipe and install pipe fittings in accordance with pipeline welding standards and relevant code requirements  
2.2 Prepare and fabricate materials as per the specification safely utilising and operating identified equipment  
2.3 Apply knowledge of health, safety and environmental legislative requirements to fitting and fabrication process  
2.4 Inspect fabricated materials to ensure that they meet specification and code requirements |
| 3. Conduct dogging, slinging and operation of crane | 3.1 Utilise correct dogging and slinging operations to move and transport fabricated materials and equipment  
3.2 Operate crane safely and in accordance with agreed operational procedures and policies |
| 4. Install fabricated components | 4.1 Prepare pipeline system conditions for installation process  
4.2 Issue permit to work to authorise installation activities to be conducted  
4.3 Install fabricated components as per relevant procedure and code requirements, ensuring that the appropriate welding/cutting technique is applied  
4.4 Conduct inspection of welding/cutting to establish integrity of work carried out meets procedure and code requirements |
| 5. Reestablish pipeline to operational conditions | 5.1 Re-establish the system in order to meet pipeline system operational requirements  
5.2 Restore the repair site to meet environmental and operational requirements  
5.3 Cancel the permit to work and sign off at completion of the repair  
5.4 Conduct liaison with relevant company departments to ensure all records and drawings are updated to reflect the repair/modification |
RANGE OF VARIABLES:

Context:

Inspection and testing techniques may include:
- hydrostatic testing
- magnetic particle inspection
- Radiography
- ultrasonic inspection
- dye penetrant inspection.

Pipe and fittings may include:
- linepipe and station pipe
- screwed and welded fittings/components.

Welding/cutting techniques may include:
- hot welding and cutting operations
- cold welding and cutting operations.

Pipe cutting equipment may include:
- oxy/acetylene cutting equipment
- Wachs cold cutting equipment
- Rigid pipe cutters.

Lifting and moving equipment may include:
- operation of crane up to 10 tonnes
- dogging and slinging activities
- operation of transport equipment

Welding processes may include:
- manual metal arc welding
- tig welding.

Applicable Australian standards/legislation relevant may include:
- OH&S legislation
- AS 2885
- AS 1697
- AS 2062
- AS 1171
- AS 4041
- AS 3788
- AS 4037
- AS 2177
- AS 1796
- AS 2205
- AS 1553
- AS 1978.
Techniques include:
- the use of pipe alignment clamps
- welding procedure and welder qualification tests
- hot tap and stoppling techniques and procedures
- the use of lamb air movers
- fitting of pipeline repair sleeves and clamps.

Plans and drawings may include:
- pipeline alignment drawings
- process & instrument drawings
- workshop fabrication drawings.

Documentation may include:
- enterprise procedures and work instructions
- manufacturers’ specifications
- statutory requirements and standards
- quality assurance standards, and inspection and testing requirements.

This unit applies to non-pressured systems only.

The use of hand and power tools is required.

**OH&S:**
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work
- job hazard analysis
- emergency response plans/procedures
Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
It is expected that a person undertaking this competency demonstrates an awareness of all site specific safety and environmental requirements and an ability to apply the permit to work system within the context of this unit.

It is essential that a person undertaking this competency demonstrates an ability to interpret a range of pipeline drawings, plans, statutory codes, welding and inspection procedures to undertake the required or identified pipeline welding and cutting operations.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD336A Undertake pipeline repairs and modifications
- PMAHYD431A Manage pipeline emergencies.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

It is expected that a person undertaking this unit would be able to demonstrate a knowledge of pipeline welding and cutting operations utilised for the repair and maintenance of varying types of pipeline operations.

An ability to coordinate own and the work of others including on site contractors and other third party operators is required as an essential component of this competency.
A person undertaking this unit must be able to demonstrate the knowledge and application of the following techniques and theories:

- welding and cutting techniques including hot and cold welding
- pipe and fitting grades and standards
- hot tap and stoppling techniques
- welding processes including manual, metal arc and TIG
- inspection of pipeline welding and fabrication
- pipeline codes and standards
- welding procedure and welder qualification testing
- pipeline drawings and plans
- the operation of pipe cutting equipment
- the operation of lifting and moving equipment
- fitting of pipeline repair clamps and sleeves
- safety systems and procedures
- quality assurance system requirements
- excavation of pipelines
- emergency response plans and procedures.

Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Undertake Pipeline Repairs And Modifications  (PMA HYD 336 A)

UNIT DESCRIPTOR:
This unit refers to the repair and modification techniques carried out on pipeline systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Prepare and plan for pipe repairs and modification | Demonstrates the ability to:  
1.1 Interpret and check plans and drawings of proposed works  
1.2 Organise equipment and liaise with relevant company personnel and services in order to establish pipeline system/site conditions and co-ordinate repair activities  
1.3 Convey information concerning the identified repair/modification to all parties concerned with the activity  
1.4 Conduct pipe fitting and fabrication  
1.5 Fabricate pipe and install fittings in accordance with pipe standards and relevant code requirements  
1.6 Prepare and fabricate materials as per the specification, safely utilising and operating identified equipment  
1.7 Apply knowledge of health, safety and environmental legislative requirements to fitting and fabrication process  
1.8 Inspect fabricated materials to ensure that they meet specification requirements |
| 2. Conduct dogging, slinging and operation of crane | 2.1 Utilise correct dogging and slinging operations to move and transport fabricated materials and equipment  
2.2 Operate crane safely and in accordance with agreed operational procedures and policies |
| 3. Install fabricated components | 3.1 Prepare pipeline system conditions for installation process  
3.2 Issue permit to work to authorise installation activities to be conducted  
3.3 Install fabricated components as per relevant procedure and code requirements  
3.4 Conduct inspection of works to establish integrity of work carried out meets procedure and code requirements |
| 4. Re-establish pipeline to operational conditions | 4.1 Re-establish the system order to meet pipeline system operational requirements  
4.2 Restore the repair site to meet environmental and operational requirements  
4.3 Cancel the permit to work and sign off at completion of the repair  
4.4 Liaise with relevant company departments to ensure all records and drawings are updated to reflect the repair/modification |
RANGE OF VARIABLES:

Context:
Inspection and testing techniques may include:
- hydrostatic testing
- magnetic particle inspection
- radiography
- ultrasonic inspection
- dye penetrant inspection.

Repair/modification techniques may include:
- hot tapping operations
- hot tap and stoppling operations
- pipe threading machinery
- welding and cutting operations
- fitting of pipeline repair sleeves and clamps
- use of lamb air movers
- use of pipe alignment clamps
- use of chiksans.

Pipe cutting equipment includes:
- oxy-acetylene cutting equipment
- Wachs cold cutting equipment
- rigid pipe cutters.

Lifting and moving equipment may include:
- operation of crane up to 10 tonnes
- dogging and slinging activities
- operation of transport equipment.

Materials used in fabrication may include:
- linepipe and station pipe
- screwed and welded fittings
- flanges, gaskets and studs/nuts.

Plans and drawings may include:
- pipeline alignment drawings
- process & instrument drawings
- workshop fabrication drawings
- use of hand and power tools.
Applicable Australian standards/legislation may include:
- OH&S legislation
- AS 2885
- AS 1697
- AS 2062
- AS 1171
- AS 4041
- AS 3788
- AS 4037
- AS 2177
- AS 1796
- AS 2205
- AS 1553
- AS 1978.

Documentation may include:
- enterprise procedures and work instructions
- manufacturers’ specifications
- statutory requirements and standards
- quality assurance standards, and inspection and testing requirements.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work
- job hazard analysis
- emergency response plans/procedures.
**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

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**EVIDENCE GUIDE:**

**Critical Aspects:**
It is expected that a person undertaking this competency demonstrate an awareness of all site specific safety and environmental requirements and demonstrate an ability to apply the permit to work system within the context of this unit.

It is essential that a person undertaking this competency demonstrate an ability to interpret a range of pipeline drawings and plans in order to undertake the required or identified pipeline repairs/modifications.

**Concurrent Assessment and Prerequisites:**
This unit should be assessed concurrently with or following assessment in:
- PMAHYD335A Weld and cut operational pipeline
- PMAHYD236A Operate vehicles in the field.

Individual enterprises may choose to add other prerequisites relevant to their process.

**Essential Knowledge:**
A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

An ability to co-ordinate own and the work of others including on site contractors and other third party operators is required as an essential component of this competency.

It is expected that a person undertaking this unit would be able to demonstrate a knowledge pipeline welding and cutting operations utilised for the repair and maintenance of varying types of pipeline operations.

A person undertaking this unit of competency would also be expected to demonstrate an ability to not only repair but undertake where possible or advise what types of pipeline modifications should be undertaken by other team personnel or third party operators.
An ability to co-ordinate own work and the work of others including on site contractors and other third party operators is required an essential component of this competency.

A person undertaking this unit must be able to demonstrate the knowledge and application of the following techniques and theories:

- hot tap and stoppling operations
- installation of temporary bypass pipework and pressure reduction equipment
- dogging and rigging techniques
- moving equipment operation
- inspection techniques
- pipeline repair and modification techniques
- welding and fabrication operations and techniques
- safety systems and procedures
- pipe and fittings theories and principles
- quality assurance system requirements
- excavation of pipelines
- emergency response procedures.

**Assessment Method, Context and Resource Implications:**

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

*Apply Health, Safety And Environmental Rules And Regulations In The Workplace*  
(PMA HYD 337 A)

UNIT DESCRIPTOR:
This unit refers to the development, management and implementation of safe and environmental responsible work practices and systems within the pipeline industry.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</table>
| 1. Select the job/tasks requiring analysis | 1.1 Define the scope of the proposed analysis to ensure all health, safety and environmental aspects are addressed  
1.2 Evaluate tasks within the workplace in order to detect hazards and the likelihood of incidents, including potential injuries, likely environmental impacts and or changes to established or new procedures or work instructions  
1.3 Record collected data and analyse to determine which tasks/jobs will require reviewing and/or the development of new or further documentation  
1.4 Establish priorities for each identified task with other team members and relevant company personnel |
| 2. Conduct job safety and environmental analysis program | 2.1 List and prioritise identified tasks/jobs and establish an agreed timetable of development with the relevant company personnel  
2.2 Analyse tasks/jobs for hazards and allocate appropriate control measures to the identified hazards  
2.3 Record results of each completed analysis and review with relevant company personnel |
| 3. Develop workplace procedures and work instructions | 3.1 Prepare and draft proposed health, safety and environment workplace procedures and work instructions incorporating the results of the job safety and environment analysis  
3.2 Test and validate the drafted HS&E workplace procedures and work instructions to ensure they conform to all stated requirements  
3.3 Document the final results of the analysis and retain for implementing into the workplace and review on a regular basis |
**RANGE OF VARIABLES:**

**Context:**

Job safety and environment analysis will be conducted in accordance with required company procedures and policies.

**OH&S:**

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant's business goals is required as a basis for decision making and action.

**Assessment Focus:**

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
**EVIDENCE GUIDE:**

**Critical Aspects:**
It is expected that a person undertaking this competency demonstrates an awareness of all site specific safety and environmental requirements within the context of this unit.

**Concurrent Assessment and Prerequisites:**
Nil

Individual enterprises may choose to add other prerequisites relevant to their process.

**Essential Knowledge:**
A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

Knowledge of the following items:
- personal protective equipment
- workplace procedures and work instructions
- company policies regarding health and safety and environment
- hazard identification and control
- basic risk assessment of workplace jobs/tasks
- job and task lists
- workplace documentation and recording systems
- environmental impacts likely to arise for activities
- measures for eliminating and/or reducing impacts on the environment.

An ability to coordinate own work and the work of other team members is regarded as an essential component of this unit of competency.

**Assessment Method, Context and Resource Implications:**
Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
Apply Health, Safety And Environmental Rules & Regulations In The Workplace
## UNIT TITLE:

**Monitor Treatment Facilities, Operations And Stations (PMA HYD 400 A)**

## UNIT DESCRIPTOR:
This competency covers the operation and management of either remote treatment stations or satellite locations.

## ELEMENT | PERFORMANCE CRITERIA
--- | ---
**1. Conduct product separation** | Demonstrates the ability to:
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

**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
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
3.3 Conduct trunk line/flow line maintenance to ensure the operating integrity and capacity of the trunk or flow line is maintained

**4. Record transfer details** | 4.1 Log, record and forward all product transfers to the processing facility to provide an up to date indication of production flows
4.2 Distribute data collected to field operators 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
RANGE OF VARIABLES:

Context:
This competence is to be demonstrated in relation to a variety of treatment facilities and equipment which may include:
- valves
- pumps
- prime movers
- compressors
- separators
  - cyclonic, vertical, horizontal
- instrumentation
  - transmitters, displayers, controllers, PLCs and associated indicators and panels
- storage tanks, ponds and dams.

All operations are performed in accordance with standard operating procedures and may include individual or team environments.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Specific legislative environmental and site specific environmental management policies and procedures.

Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
### EVIDENCE GUIDE:

#### Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

This competency should be assessed within the work environment, utilising as many of the required tools and equipment noted in the range statement as possible. It would also be expected that general purpose tools and testing equipment be used where appropriate within the operation of this competency.

All work conducted as part of an assessment must be demonstrated in a safe and efficient manner and where applicable within the requirements of the permit to work system.

#### Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- PMAHYD201A Operate and monitor prime movers
- PMAHYD203A Operate and monitor valve systems
- PMAHYD202A Operate and monitor pumping systems and equipment and/or
- PMAHYD314A Operate and monitor compressor systems and equipment.

Individual enterprises may choose to add other prerequisites relevant to their process.

#### Essential Knowledge:
Demonstration of competence in this unit must include knowledge of:
- specific operational requirements
- the 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.

#### Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

*Manage Plant Shutdown And Restart (PMA HYD 401 A)*

## UNIT DESCRIPTOR:

This competency covers the shutdown and restarting of the production process in a safe and efficient manner due to an unplanned shutdown or emergency situation.

### ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| **1. Manage shutdown sequence** | Demonstrates the ability to:  
1.1 Check and verify automatic safety systems to ensure that the unit has been made safe  
1.2 Identify the reason for, or cause of the shutdown by troubleshooting the system and by utilising all available data and information systems  
1.3 Obtain confirmation of the identified shutdown from field based operators to verify both the nature and the reliability of the shutdown  
1.4 Rectify the fault or shutdown cause through either repair of the operational fault or readjustment before returning the system to start-up status |
| **2. Conduct start-up process** | 2.1 Satisfy all start-up permissives prior to start up process being commenced  
2.2 Conduct start-up in accordance with agreed procedures and site requirements, and in a safe and efficient manner, ensuring a return to steady state operation is achieved |
| **3. Document shutdown & 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:
This unit can be applied to a planned or unplanned shutdown, where the operator's actions and responses are governed by the action and responses of the system, which initiate the shutdown process.

This competency can be applied to a DCS, and all analogue control systems.

The work embodied in this competency can relate to planned and unplanned control of the process and production systems.

This competency requires the ability both to work within a team environment and to work independently of others.

It typically involves the use or operation of personal computers, other hardware mediums and associated software.

The application of all stated emergency procedures which are relevant to the site or enterprise, and adherence to required reporting techniques and formats, are required.

The permit to work system applies.

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required for decisionmaking and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
This competency should be assessed in the work environment, utilising a variety of process control systems and control mechanisms.

It is expected that a person undertaking this competency would have operated the site specific control systems and instrumentation.

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.

Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to avoid problems rather than on recovery from a disaster.

It is essential that the person undertaking this competency be able to demonstrate the operation of:
- alarm systems
- emergency systems, including fire and shutdown
- communication systems, including radio, fax and phone.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- an appropriate ‘process’ competency at level 3

Individual enterprises may choose to add other prerequisites relevant to their process.

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.
Assessment Method, Context and Resource Implications:

An understanding of how to communicate with a variety of areas, both internal and external to the production process, and the choice of the appropriate medium to conduct this communication are essential components of this competency.

An ability to co-ordinate with other work groups and a demonstrated knowledge of the interrelationships within the production/process areas in order to manage any given situation would be considered as being an essential component of this unit of competency.

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Undertake Incident Control  (PMA HYD 402 A)

UNIT DESCRIPTOR:
This unit of competency refers to the management, co-ordination and response to emergency situations within an onshore or offshore installation or facility.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1 Collect and assess emergency information | Demonstrates the ability to:
| 1.1 Ascertaining the scope and severity of the emergency as quickly as possible, from information received from alarms and other means |
| 1.2 Collating and assessing information on emergency |
| 1.3 Developing appropriate responses to the information received based on emergency response planning |
| 2 Implement emergency response strategies | 2.1 Developing, or promptly implementing, onsite strategies in order to combat the emergency |
| 2.2 Monitoring continuously information flows relating to the emergency in order to evaluate the effectiveness of the implemented strategy |
| 2.3 Coordinating team activities and resource allocation and direct them to meet the identified emergency |
| 2.4 Delegating authority to appropriate personnel as the situation warrants |
| 3 Liaise with emergency control | 3.1 Collating and communicating information relating to the emergency to emergency control centre |
| 3.2 Requesting external assistance as appropriate |
| 3.3 Co-ordinating/incorporating external assistance into emergency response |
| 3.4 Controlling internal and external communication in accordance with the emergency response plan |
| 3 Co-ordinate emergency responses | 4.1 Conveying feedback relating to progress/status of the emergency to emergency response teams and other personnel |
| 4.2 Regularly reassessing and modifying responses and tactics in accordance with the status of the emergency |
| 3 Assess emergency response/actions | 5.1 Collating and assessing 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 Undertaking a post-response evaluation of the emergency in order to determine the effectiveness of the response strategies and the emergency response plan |
| 6.2 Recommending and communicating modification and adjustments to the emergency response plans to appropriate personnel |
| 6.3 Reviewing and modifying planning of emergency response exercises and training in light of the outcomes of the emergency response evaluation |
**RANGE OF VARIABLES:**

**Context:**
This unit of competency would be applied to those persons who either regularly travel or are permanently assigned to any of the following facilities and installations:
- onshore/offshore installation/rig
- floating production vessel
- island based facility
- onshore production, processing and/or storage facilities.

A person undertaking this unit of competency would normally be in command or control of an onshore or offshore facility or installation, or be required to deputise in this role.

Site specific response plans must be adhered to.

Systems and resources include:
- emergency repair equipment
- emergency response systems
- emergency communication systems
- work management systems
- installation facility and operational layout
- safety case or hazard control plan management systems.

Environmental legislative requirements must be adhered to.

**OH&S:**
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required. Thorough knowledge of enterprise standard procedures is essential.

**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
This unit of competency would be applied by those persons who as a normal part of their work responsibilities and duties control and manage emergency response teams (ERT) and other personnel upon an onshore or offshore facility or installation.

Critical Aspects:
The person undertaking this unit of competency would be expected to demonstrate:
- an ability to collate information and make decisions within a highly stressful environment
- an ability to provide a high level of leadership and interpersonal communication
- a knowledge of the operational capacity, layout and condition of a facility/installation
- a knowledge of all work management procedures
- an ability to coordinate and cooperate effectively with a range of external agencies and services.

Concurrent Assessment and Prerequisites:
It would be expected that before undertaking this unit of competency a person will have successfully completed or be able to demonstrate competence in the following units of competency:
- PMAHYD207A Undertake first response to fire incidents.

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
- 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.
**Essential Skills:**

It would be expected that a person undertaking this unit of competency would be able to demonstrate the management and control of an onsite incident control room, and the use and application of a range of fire fighting, rescue, protective equipment and self contained breathing apparatus.

A person undertaking this competency would be able to demonstrate the capability to control and lead all facility personnel in an effective emergency response.

**Resource Implications:**

Standard resources & equipment found in the workplace should be used for the demonstration of competence.

**Context of Assessment:**

Competency may be demonstrated within a simulated context or in the workplace. Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determine the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes to technology, procedures and government regulations.
## UNIT TITLE:

*Manage Pipeline Emergencies (PMA HYD 431 A)*

## UNIT DESCRIPTOR:

This unit refers to the management co-ordination of emergency incidents and situations within the pipeline system and associated facilities.

### ELEMENT | PERFORMANCE CRITERIA
--- | ---
1. Collate and assess information on emergency | Demonstrates the ability to:
   1.1 Ascertain the scope and severity of the emergency as quickly as possible from information received from alarms, company personnel and other media
   1.2 Initiate the appropriate responses to the information received based on emergency response plan
2. Implement emergency response strategies | 2.1 Develop or implement on site strategies in order to control the site of the identified emergency
   2.2 Continuously monitor and convey information flows relating to the emergency to other company personnel and services in order to evaluate the progress of the emergency
   2.3 Delegate authority to appropriately nominated personnel as the situation warrants
   2.4 Allocate/coordinate and mobilise resources to meet the identified emergency
3. Communicate the emergency | 3.1 Communicate information relating to the emergency to relevant authorities and where required, seek external assistance
   3.2 Control internal and external communication in accordance with the emergency response plan
4. Co-ordinate emergency response | 4.1 Convey feedback relating to progress/status of the emergency to emergency response teams and other personnel
   4.2 Modify/apply responses and tactics in accordance with the status of the emergency
   4.3 Assess the emergency in order to determine if the situation has continued to escalate or is being controlled
5. Assess emergency response/actions | 5.1 Make a final decision and communicate to declare the end of the emergency on the pipeline system
   5.2 Undertake a post response evaluation of the emergency in order to determine the effectiveness of the response strategies and the emergency response plan
   5.3 Recommend modifications and adjustments to the emergency response plans as appropriate
   5.4 Review planning of emergency response exercises and training and modify in light of the outcomes of the emergency response evaluation
**RANGE OF VARIABLES:**

**Context:**

Equipment may include:
- pipeline repair clamps and equipment
- hot tap and stoppling equipment
- pipeline repair sleeves
- emergency by - pass piping
- chiksans
- pipe alignment clamps
- mobile crane
- lifting and slinging equipment
- Lamb air movers and compressor.

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.

**OH&S:**

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.
In addition, knowledge of the following is necessary within this competency:
- permit to work
- job hazard analysis
- emergency response plan and procedures
- site specific emergency response plans
- emergency communication systems.

**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**EVIDENCE GUIDE:**

**Critical Aspects:**
This unit of competency will be applied by those persons who, as a normal part of their work responsibilities and duties, control and/or manage emergency situations or incidents.

It would be expected that a person undertaking this unit of competency would have previously been deemed competent across a range of specific pipeline operational competencies.

**Concurrent Assessment and Prerequisites:**
Nil.

Individual enterprises may choose to add other prerequisites relevant to their process.
Essential Knowledge:
A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

A person undertaking this unit of competency must be able to demonstrate knowledge of the following areas:
- use and selection of fire fighting media and mediums
- fire and product leak control and containment techniques and strategies
- pipeline facility fire management and safety systems
- pipeline repair techniques
- emergency response plans and procedures
- characteristics of pipeline system and associated facilities emergency situations
- controlling the emergency site or location
- working in a team environment.

Assessment Method, Context and Resource Implications:
Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

**Coordinate Pipeline Projects (PMA HYD 432 A)**

### UNIT DESCRIPTOR:
This unit refers to the activities carried out to enable efficient coordination of projects on pipeline systems and facilities.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prepare project specification documents</td>
<td>Demonstrates the ability to:</td>
</tr>
</tbody>
</table>
| 2. Prepare project schedule and documentation | 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 tender |
| 3. Conduct induction training of project | 2.1 Draft a project schedule to establish project time frame, 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 |
| | 3.1 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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Purchase materials required for fabrication and installation on the project and inspect to ensure all items meet project specifications</td>
</tr>
<tr>
<td>4.2</td>
<td>Monitor project works to ensure activities are carried out to project specification and minimal impact occurs on existing operations and environment</td>
</tr>
<tr>
<td>4.3</td>
<td>Issue permits to work where project activities impact on existing pipeline operations</td>
</tr>
<tr>
<td>4.4</td>
<td>Amend and/or modify original specifications and communicate to all parties involved as per the relevant company procedure</td>
</tr>
<tr>
<td>4.5</td>
<td>Produce project reports updating project schedule progress, activities and health, safety and environmental issues and discuss with all parties involved</td>
</tr>
<tr>
<td>4.6</td>
<td>Draft operations manuals and compile vendor data manuals to assist in the operation of the equipment/facility after project completion</td>
</tr>
</tbody>
</table>

### 5. Complete and commission project

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>5.1</td>
<td>Commission the project to ensure all work carried out meets project specifications and operational requirements</td>
</tr>
<tr>
<td>5.2</td>
<td>Restore the project site to meet environmental and operational requirements</td>
</tr>
<tr>
<td>5.3</td>
<td>Cancel permits to work and sign off at completion of works</td>
</tr>
<tr>
<td>5.4</td>
<td>Check all documentation, records and drawings pertaining to the project and verify for accuracy and hand over to the relevant operational department</td>
</tr>
</tbody>
</table>
**RANGE OF VARIABLES:**

**Context:**
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.

Provision of legislative requirements and information:
- OH&S 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)
- Department 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.

**OH&S:**
All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

In addition, knowledge of the following is necessary within this competency:
- permit to work
- job hazard analysis.

**Assessment Focus:**
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
Critical Aspects:
A person undertaking this competency should be able to demonstrate an understanding of the site or company procedures and health, safety and environmental requirements and obligations as specified both under the relevant governing legislation or within the site licence.

Also a demonstrated ability to identify a range of risks and hazards and select the appropriate course of action required to rectify the identified problem through the job safety analysis process is essential.

Concurrent Assessment and Prerequisites:
This unit should be assessed concurrently with or following assessment in:
- Hydrocarbons 335 Weld and cut operational pipeline
- PMAHYD233A Monitor pipeline civil works
- PMAHYD336A Undertake pipeline repairs and modifications
- PMAHYD431A Manage pipeline emergencies
- PMAHYD337A Apply health, safety and environmental rules and regulations in the workplace
- PMAHYD232A Maintain pipeline easements
- PMAHYD234A Install cathodic protection systems and equipment.

Individual enterprises may choose to add other prerequisites relevant to their process.

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.
Assessment Method, Context and Resource Implications:

Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Commission/Decommission Pipelines*  
*(PMA HYD 433 A)*

**UNIT DESCRIPTOR:**
This unit refers to the activities carried out to commission/decommission gas distribution pipelines.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Plan commissioning/decommissioning procedure</strong></td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Consult appropriate personnel to ensure the work is coordinated effectively with others involved on the work site</td>
<td>1. Consult appropriate personnel to ensure the work is coordinated effectively with others involved on the work site</td>
</tr>
<tr>
<td>1.2 Obtain materials necessary to complete the work in accordance with operating procedures and check against job requirements</td>
<td>1.2 Obtain materials necessary to complete the work in accordance with operating procedures and check against job requirements</td>
</tr>
<tr>
<td>1.3 Obtain tools and equipment necessary to carry out the work in accordance with operating procedures and check for correct operation and safety</td>
<td>1.3 Obtain tools and equipment necessary to carry out the work in accordance with operating procedures and check for correct operation and safety</td>
</tr>
<tr>
<td>1.4 Prepare plans to ensure that procedures are performed in the correct sequence</td>
<td>1.4 Prepare plans to ensure that procedures are performed in the correct sequence</td>
</tr>
<tr>
<td>1.5 Obtain approvals where necessary from appropriate authorities to ensure commissioning process proceeds in accordance with the plan</td>
<td>1.5 Obtain approvals where necessary from appropriate authorities to ensure commissioning process proceeds in accordance with the plan</td>
</tr>
<tr>
<td><strong>2. Commission/Decommission system</strong></td>
<td>2.1 Bring the pipeline system on line and or take off line</td>
</tr>
<tr>
<td>2.2 Make and report adjustments</td>
<td>2.2 Make and report adjustments</td>
</tr>
<tr>
<td>2.3 Prepare reports in accordance legislative requirements to maintain the historical record</td>
<td>2.3 Prepare reports in accordance legislative requirements to maintain the historical record</td>
</tr>
<tr>
<td><strong>3. Inspect test and notify completion of work</strong></td>
<td>3.1 Select tools and equipment appropriate to the testing requirements and utilise in accordance with manufacturer’s specifications, and legislative requirements</td>
</tr>
<tr>
<td>3.2 Test pipeline systems in accordance with legislative requirements</td>
<td>3.2 Test pipeline systems in accordance with legislative requirements</td>
</tr>
<tr>
<td>3.3 Undertake final inspections to ensure pipeline conforms to requirements</td>
<td>3.3 Undertake final inspections to ensure pipeline conforms to requirements</td>
</tr>
<tr>
<td>3.4 Notify work completion</td>
<td>3.4 Notify work completion</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:

Appropriate personnel may include:
- manager and supervisors
- maintenance personnel
- contractors
- company personnel.

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.

Pipeline systems may include:
- pipes
- valves
- compressors
- electrical and electronic components
- PLCs
- Cathodic protection
- pressure regulation and meters.

Documentation may include:
- operating procedures
- OH&S and environmental legislative requirements
- manufacturers’ specifications
- appropriate authority approvals
- quality assurance inspection and test reports.

Applicable Australian Standards relevant may include:
- AS 2885.

Legislative requirements may include:
- OH&S and EPA legislation and traffic control.
**OH&S:**

All operations are subject to stringent OH&S and environmental requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Persons are required to have skills in hazard identification, assessment and application of control measures.

**Knowledge and Enterprise Requirements:**

Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Thorough knowledge of enterprise standard operating procedures is essential. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

**Assessment Focus:**

Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:
- Critical aspects of evidence will include:
  - commissioning and decommission planning procedures
  - pipeline testing and adjusting procedures
  - adhering to operating procedures
  - environmental and safety legislation.

Concurrent Assessment and Prerequisites:
- This unit should be assessed concurrently with or following assessment in:
  - PMAHYD335A Weld and cut operational pipeline
  - PMAHYD336A Undertake pipeline repairs and modifications.

  Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
- A demonstrated working knowledge and application of the company’s specific work organisations and workflow would be highly regarded.

Assessment Method, Context and Resource Implications:
- Competence in this unit should be assessed by observation over time on a pipeline system. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

  Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

  In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
Manufacturing Learning Australia

‘Process Support’ and ‘Business Support’ competency standards

for the

Chemical, Hydrocarbons And Oil Refining Industries

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Process Support and Business Support Competencies

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**UNIT TITLE:**

*Relay And Respond To Information (PMA COM 100 A)*

**UNIT DESCRIPTOR:**
This unit of competency covers being able to receive and pass on written and oral messages and to provide relevant information in response to requests within time lines.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</table>
| 1. Receive and relay oral and written messages | 1.1 Understand the message  
1.2 Accurately record the message  
1.3 Relay message accurately to appropriate person or section within designated timelines |
| 2. Interpret oral or written messages | 2.1 Clarify message if necessary  
2.2 Take appropriate action |
| 3. Respond to information | 3.1 Acknowledge and understand the request for information.  
3.2 Access information from appropriate sources  
3.3 Relay information to appropriate person or section |
RANGE OF VARIABLES:
Context:
This competency includes the following indicative information sources and documentation:
- standard operating procedures
- material safety data sheets
- job cards
- maintenance logs
- enterprise policies, eg, telephone protocol.

This competency includes items of equipment such as:
- telephone
- two way radio
- email.

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the organisations information systems, procedures and equipment sufficient to provide and respond to routine information requests.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to giving and following routine instructions.

Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion. Indicative functions include the simple entry and access of data associated with production processes, workplace safety signs, procedures and practices.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Context of Assessment:
This competency is typically performed by all operators, who may be working individually or in a team environment. The competency unit applies to a wide range of information sources and documentation.

Critical Aspects
Competence must be demonstrated in the ability to provide and assess all required information and that the information provided both verbally and in writing is completed in a clear and concise manner, that is easily understood by others and in accordance with workplace requirements.

Consistent performance at the required standard should be demonstrated. In particular, look to see that:
- written communication is clear, concise and accurate
- all information is provided in an efficient, effective, courteous and timely manner
- calls are answered within accepted industry time lines
- messages are clear, concise and accurate
- listening is attentive.

Concurrent Assessment and Prerequisites:
This unit has no prerequisites, but direct links can be made between this unit of competency and unit PMACOM200A: Process and record information.

Essential Knowledge:
Competence to include the ability to apply and explain:
- importance of workplace documentation
- enterprise quality and safety procedures.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on the job. Where this is done, the timeframe must allow for adequate assessment of the competency under a range of conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by project, and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Process And Record Information (PMA COM 200 A)*

**UNIT DESCRIPTOR:**

This unit of competency covers the provision and processing of all relevant information by responding to the information requirements of the plant including the completion of all workplace documents and clearly and concisely providing relevant information to others.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Access information</td>
<td>Demonstrates the ability to:</td>
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<tr>
<td>1.1 Identify the need for information</td>
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<tr>
<td>1.2 Request appropriate information</td>
<td></td>
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<tr>
<td>1.3 Access information in accordance with procedures</td>
<td></td>
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<tr>
<td>1.4 Comply with security procedures in accessing appropriate information</td>
<td></td>
</tr>
<tr>
<td>2. Provide appropriate information</td>
<td></td>
</tr>
<tr>
<td>2.1 Deal with enquiries promptly and courteously</td>
<td></td>
</tr>
<tr>
<td>2.2 Establish details of enquiry by questioning and summarising</td>
<td></td>
</tr>
<tr>
<td>2.3 Provide appropriate information relevant to enquirer’s request</td>
<td></td>
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<tr>
<td>2.4 Organise information clearly, concisely and logically</td>
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<tr>
<td>2.5 Provide information in a form that is readily understood by others</td>
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<tr>
<td>2.6 Provide information in a timely manner</td>
<td></td>
</tr>
<tr>
<td>2.7 Redirect enquiries to relevant personnel for resolution where outside the operator’s area of responsibility</td>
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<tr>
<td>3. Give and follow routine instructions</td>
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</tr>
<tr>
<td>3.1 Give accurate, clear and concise instructions that are consistent with the skills of the receiver</td>
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</tr>
<tr>
<td>3.2 Ensure that interaction with others is efficient, effective, responsive, courteous and supportive</td>
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<tr>
<td>3.3 Confirm that instructions are understood</td>
<td></td>
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<tr>
<td>3.4 Follow prescribed and routine work related sequences</td>
<td></td>
</tr>
<tr>
<td>4. Provide written and oral reports</td>
<td></td>
</tr>
<tr>
<td>4.1 Complete handovers providing all appropriate information for the next shift</td>
<td></td>
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<tr>
<td>4.2 Reaffirm handover information by completing status checks</td>
<td></td>
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<tr>
<td>4.3 Complete all workplace documents clearly and accurately in accordance with procedures</td>
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<tr>
<td>4.4 Report all relevant information clearly and concisely</td>
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</tbody>
</table>
RANGE OF VARIABLES:

Context:
This competency includes the following indicative information sources and documentation:
- standard operating procedures
- material safety data sheets
- job cards
- maintenance logs
- non-compliance reports
- plant drawings
- email.

This competency includes items of equipment such as:
- telephone
- two way radio
- computer equipment.

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the organisation's information systems, procedures and equipment sufficient to provide and respond to routine information requests.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to giving and following routine instructions.

Thorough knowledge of enterprise standard operating procedures is required. Awareness of the plant’s business goals and key performance indicators is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
**EVIDENCE GUIDE:**

**Context of Assessment:**
This competency is typically performed by all operators, who may be working individually or in a team environment. The competency unit applies to a wide range of information sources and documentation.

**Critical Aspects:**
Competence must be demonstrated in the ability to provide and assess all required information and that the information provided both verbally and in writing is completed in a clear and concise manner, that is easily understood by others and in accordance with workplace requirements.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- reports and records are completed accurately, concisely and in accordance with procedures
- all information is provided in an efficient, effective, courteous and timely manner
- completion of shift handover, log books and company production records conveys all relevant information
- communication distinguishes between relevant and peripheral issues.

**Concurrent Assessment and Prerequisites:**
This unit has the prerequisite competencies of:
- PMACOM100A Relay and respond to information.

Individual enterprises may choose to add other prerequisites relevant to their process.

**Essential Knowledge:**
Competence to include the ability to apply and explain:
- importance of workplace documentation
- enterprise quality and safety procedures.

**Assessment Method, Context and Resource Implications:**
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of the competency under a range of conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by project, and/or a range of case studies/scenarios and/or simulation. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in a manner appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Contribute To The Development Of Plant Documentation (PMA COM 300 A)

UNIT DESCRIPTOR:
This unit of competency covers the development of relevant plant documentation and systems in response to identified information requirements, including the development and/or amendment of workplace documents, procedures and record keeping systems.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</table>
| 1. Identify information need/deficiency | 1.1 Understand the information requirements of the organisation  
1.2 Evaluate current documentation  
1.3 Recognise information need/deficiency  
1.4 Discuss information requirements with appropriate personnel |
| 2. Develop/revise plant documentation | 2.1 Specify information need and set/prioritise objectives  
2.2 Analyse existing documentation/records in accordance with specified requirements  
2.3 Develop/amend documentation as a draft in accordance with specifications to standard format  
2.4 Issue documentation to appropriate personnel for review  
2.5 Edit documentation and amend in accordance with review requirements  
2.6 Complete documentation to satisfy the initial identified need/deficiency |
| 3. Communicate changes to plant documentation | 3.1 Explain and communicate documentation to all relevant personnel  
3.2 Distribute documentation to all appropriate personnel  
3.3 Evaluate implementation of documentation  
3.4 Amend documents if required |
RANGE OF VARIABLES:

Context:
This competency includes the following indicative plant documentation:

- standard operating procedures
- work instructions
- operating manuals
- quality procedures
- training program contents
- safety data sheets
- job cards
- maintenance logs
- non compliance reports
- incidence and accident reports
- permits
- schematics/process flows/engineering drawings.

This competency includes items of equipment such as:
- computer equipment.

All operations are performed in accordance with standard operating procedures.

OH&S
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the organisation’s information systems, procedures, equipment and relevant documentation sufficient to be able to develop or amend company documentation.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the drafting of all relevant documentation.

Thorough knowledge of enterprise standard operating procedures is required. Awareness of the plant’s business goals and key performance indicators is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
**EVIDENCE GUIDE:**

**Context of Assessment:**
This competency is typically performed by experienced operators, who may be working individually or in a team environment. The competency unit applies to a wide range of plant documentation.

**Critical Aspects:**
Competence must be demonstrated in the ability to draft and amend company documentation in accordance with specifications. Documentation is completed in a clear and concise manner, that is easily understood by others and in accordance with workplace requirements/specifications.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- information required is researched and intended use is taken into account
- documentation is completed accurately, concisely and in accordance with requirements
- completed documentation is easily understood by the recipient
- information is communicated in the appropriate manner
- communication distinguishes between relevant and peripheral issues.

**Concurrent Assessment and Prerequisites:**
This unit has the prerequisite competencies of:
- PMACOM100A Relay and respond to information
- PMACOM200A Process and record information.

Individual enterprises may choose to add other prerequisites relevant to their process.

**Essential Knowledge:**
Competence to include the ability to apply and explain:
- importance of workplace documentation
- enterprise quality and safety procedures.

**Assessment Method, Context and Resource Implications:**
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of the competency a range of conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by project, and/or a range of case studies/scenarios and/or simulation. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:  

Identify And Minimise Environmental Hazards (PMA ENV 100 A)

UNIT DESCRIPTOR:  
This competency covers the awareness of operating personnel of environmental issues and responsibilities and their ability to work according to enterprise environmental policies and procedures to minimise environmental threats.

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<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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| **1. Identify potential environmental threats** | 1.1 Recognise the type and severity of environmental threat posed by the materials and processes used  
1.2 Identify ways materials used could enter the environment  
1.3 Identify sensitive features of the local environment and their impact on work practice and procedures  
1.4 Use work practices which minimise waste in their own job(s) |
| **2. Monitor environmental discharges/emissions** | 2.1 Monitor and measure emission levels in accordance with standard operating procedures  
2.2 State allowable emission levels  
2.3 Keep discharges and emissions within targeted limits  
2.4 Recognise abnormal or unacceptable emission levels and describe them according to the standard operating procedures  
2.5 Explain the consequences of exceeding allowable emission levels in both regulatory and environmental terms  
2.6 Implement plant waste minimisation procedures and practices  
2.7 Comply with internal and external regulations and policies for waste removal from site |
| **3. Respond to abnormal environmental discharges/missions** | 3.1 Report abnormal emissions to appropriate personnel  
3.2 Apply containment procedures in accordance with standard operating procedures where appropriate  
3.3 Follow correct safety procedures and utilise personal protective equipment as required |
### RANGE OF VARIABLES:

#### Context:
This competency is performed by all operators in all plants. It reflects the industry concern to operate in an environmentally friendly manner and the regulatory requirements on all plants and all personnel.

This competency unit includes:

a. awareness of the local environment and environmental issues such as:
   - sensitive waterways/wetlands
   - flows from the plant to the environment (e.g., through sandy soil, local creek etc)
   - particular environmental threats posed by materials and processes used and the work practices required to minimise these threats.

b. indicative functions such as:
   - monitoring of all sensors
   - communication, using in-plant reporting systems - verbal, electronic and written
   - initiating first response to an environmental incident in accordance with the sops.

c. resources such as:
   - containment equipment
   - personal protective equipment
   - monitoring equipment.

d. emissions/discharges include:
   - noise
   - light
   - odour
   - gas
   - smoke
   - vapour
   - liquid and solids
   - particulates
   - fumes.

Typical problems are restricted to responding in a routine, predetermined manner as specified in the standard procedures. Responses are restricted to a ‘first response’ approach, including the notifying of appropriate enterprise personnel.

It is assumed that standard work practices will include features to minimise waste and environmental impact.

All operations are performed in accordance with standard operating procedures.
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the equipment item.

Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:
Assessment should establish the ability to follow procedures, recognise situations requiring action, and then efficiently implement the action specified in the standard procedures.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
Critical Aspects:
Consistent performance at the required standard should be demonstrated. In particular look to see that:
- standard procedures are followed
- deviations from desired conditions are recognised
- action specified in the standard procedures is carried out
- the impact of work practices/actions on the environment is understood

Concurrent Assessment and Prerequisites:
This unit has no prerequisite competencies

It should be assessed in conjunction with:
- PMAPROC101A Make measurements
- PMAPROC102A Undertake housekeeping operations.

Individual enterprises may choose to add prerequisites and co-requisites relevant to their process.
### Essential Knowledge:

Competence to include the ability to apply the standard procedures. It includes an awareness of:

- external licensing requirements
- internal environmental control standards.
- severity of environmental hazards of materials being handled
- likely impact on the environment of materials and process
- waste minimisation practices

and a thorough knowledge of the environmental procedures of the enterprise relevant to that particular job.

### Assessment Method, Context and Resource Implications:

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Monitor And Control Environmental Hazards*  
(PMA ENV 200 A)

**UNIT DESCRIPTOR:**
This competency covers the recognition and control of environmental hazards and incidents by an operator on any plant.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>1. Identify environmental hazards</td>
<td>Demonstrates the ability to:</td>
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<tr>
<td>1.1 Identify environmental hazards</td>
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<tr>
<td>1.2 Assess location, severity and potential effect of hazard and communicate to appropriate personnel</td>
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<tr>
<td>1.3 Determine cause/source of environmental hazard</td>
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<tr>
<td>2. Respond to environmental hazard</td>
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<tr>
<td>2.1 Activate environmental alarms where appropriate</td>
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</tr>
<tr>
<td>2.2 Control environmental hazard is in accordance with standard operating procedures</td>
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<tr>
<td>2.3 Measure and monitor hazard in accordance with standard operating procedures</td>
<td></td>
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<tr>
<td>2.4 Document and report hazardous incident</td>
<td></td>
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<tr>
<td>3. Cooperate with internal and external bodies</td>
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<tr>
<td>3.1 Identify relevant licensing authorities/bodies</td>
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<tr>
<td>3.2 Responded to requests for information in accordance with standard operating procedures</td>
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<tr>
<td>3.3 Monitor status of the environmental hazard and communicate with appropriate personnel on an ongoing basis</td>
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<tr>
<td>4. Participate in investigation of environmental incident</td>
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<tr>
<td>4.1 Completed incident reports in accordance with standard operating procedures</td>
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<tr>
<td>4.2 Undertake investigations in accordance with standard operating procedures</td>
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<tr>
<td>4.3 Document and report findings in accordance with standard operating procedures</td>
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RANGE OF VARIABLES:

Context:
This competency is performed by operators who may be expected to control minor environmental incidents, initiate the control of more significant environmental incidents, cooperate with regulatory authorities and participate in the investigation (internal or external) of environmental incidents within the limits provided by enterprise policy and standard procedure.

It does not include the control of significant incidents which are either part of the emergency response competencies and/or the role of a management person.

Indicative functions include:

a. monitoring
   • physical senses
   • instrumentation
   • compliance with licensing arrangements

b. controlling incidents:
   • initial response for all incidents
   • controlling minor incidents

c. cooperation with appropriate bodies:
   • internal
   • external.

Typical problems will include the application of plant and process knowledge to identify environmental hazards and initiate an appropriate response. This includes losses of containment and other sources of environmental incidents where the incident is small enough to be handled by the operator, or for larger/more significant incidents, this includes the cooperation of the operator with the person controlling the incident/incident investigation.

All operations are performed in accordance with standard procedures and policies.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge of the relevant OH&S and environmental requirements, together with an ability to implement them in a manner relevant to the operation of the equipment item, are required.

Thorough knowledge of enterprise standard operating procedures is required. Some awareness of the plant’s business goals is required for decisionmaking and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
Critical Aspects:
It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- early warning signs of an environmental incident are recognised
- potential effects of an environmental incident are understood
- action is taken to ensure the incident is controlled and the situation returned to normal in a timely manner
- items initiated are followed through until final resolution has occurred.

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

Concurrent Assessment and Prerequisites:
This unit has the prerequisite competency of:
- PMAENV100a Identify and minimise environmental hazards.

It should be assessed in conjunction with competency units relevant to the process equipment.

Individual enterprises may add prerequisites and corequisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply and explain:

a. nature and severity of environmental hazard caused by potential incidents
   - nature and level of environmental threat posed by potential incidents
   - sensitivity of local environment to these environmental threats
   - pathways of entry to the environment from the plant

b. regulatory requirements such as:
   - environment protection regulations
   - OH&S
   - HAZCHEM
   - duty of care
   - dangerous goods

c. external licensing requirements such as:
   - EPA
   - water authorities
   - local councils

d. enterprise procedures.
**Assessment Method, Context and Resource Implications:**

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Minimise Environmental Impact Of Process (PMA ENV 300 A)

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.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Develop resource conservation practices and/or procedures</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Identify the nature of resources used in the plant/process</td>
<td>1.2 Determine the primary source of these resources</td>
</tr>
<tr>
<td>1.3 Describe the impact of the depletion of these resources on the environment and the society</td>
<td>1.4 Determine which resource(s) will yield a greater benefit from their conservation</td>
</tr>
<tr>
<td>1.5 Develop methods to reduce the consumption of these resources</td>
<td>1.6 Complete required documentation to implement change</td>
</tr>
<tr>
<td>2. Develop pollution minimisation practices and/or procedures</td>
<td>2.1 Identify the nature of pollutants produced by the plant/process</td>
</tr>
<tr>
<td>2.2 Determine the source(s) of these pollutants within the plant/process</td>
<td>2.3 Describe the impact of these pollutants on the environment and the society</td>
</tr>
<tr>
<td>2.4 Determine which pollutant(s) will yield a greater benefit from their reduction</td>
<td>2.5 Develop methods to reduce the production of this pollutant</td>
</tr>
<tr>
<td>2.6 Complete required documentation to implement change</td>
<td>3. Develop waste minimisation practices and/or procedures</td>
</tr>
<tr>
<td>3.1 Identify the nature of wastes produced by the plant/process</td>
<td>3.2 Determine the source(s) of these wastes within the plant/process</td>
</tr>
<tr>
<td>3.3 Describe the impact of these wastes on the environment and the society</td>
<td>3.4 Determine which waste(s) will yield a greater benefit from their reduction</td>
</tr>
<tr>
<td>3.5 Develop methods to reduce the production of this waste</td>
<td>3.6 Complete required documentation to implement change</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
This competency is performed by more experienced operators who may be expected to develop and implement improvement projects. This unit may be performed individually or as part of a team.

This is not necessarily about capital projects. It may apply to improvements brought about by changes in work practice, procedures, or if appropriate, capital projects.

Indicative functions 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.

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.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the operation of the equipment item.

Thorough knowledge of enterprise standard operating procedures is required. Some understanding of the plant’s business goals is required for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
**EVIDENCE GUIDE:**

**Critical Aspects:**

It is essential that the process be understood and that the importance of critical parameters is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action.

Consistent performance at the required standard 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
- items initiated are followed through until final resolution has occurred
- the process/plant is understood and proposals are capable of implementation.

**Concurrent Assessment and Prerequisites:**

This unit has the prerequisite competency of:

- PMAENV100A Identify and minimise environmental hazards

It should be assessed in conjunction with:

- competency units relevant to the process equipment.

Individual enterprises may choose to add prerequisites and co-requisites relevant to their process.

**Essential Knowledge:**

Competence to include the ability to apply and explain:

a. nature and severity of potential environmental hazards caused by the plant/process
b. sensitivity of local environment to these environmental threats
c. pathways of entry to the environment from the plant
d. regulatory requirements such as:
   - environment protection regulations
   - OH&S
   - HAZCHEM
   - duty of care
   - dangerous goods.
e. external licensing requirements such as:
   - EPA
   - water authorities
   - local councils.
f. enterprise procedures and practices.

**Assessment Method, Context and Resource Implications:**

Competence in this unit may be assessed by observation of performance on an improvement project. Competence may also be assessed by use of a range of case studies/scenarios.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.

As the two elements are seen as being parallel, competence in one element only needs to be demonstrated. Many projects will naturally combine both elements.
UNIT TITLE:  
*Provide First Aid* *(PMA FA 200 A)*

UNIT DESCRIPTOR:  
This competency relates to the provision of first aid where appropriate by a nominated first aider. It is not intended to apply to an occupational first aider.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1 Undertake emergency first aid | 1.1 Carry out first aid treatment of injuries  
1.2 Undertake cardiopulmonary resuscitation on victims with breathing difficulties.  
1.3 Accurately report first aid treatments given, to medical personnel and record in accordance with workplace procedure. |

RANGE OF VARIABLES:  
Context:  
This competency applies to personnel, who as first aiders have been trained and have maintained their competence at a recognised first aid course.  
First aid refers to the immediate care given to a victim of injury or sudden illness, until more advanced care can be provided.  
Cardiopulmonary resuscitation (CPR) refers to the technique which combines expired air resuscitation and external chest compressions for a victim whose breathing and heart have stopped.  
Purpose of first aid includes:  
- to preserve life  
- to protect the unconscious victim  
- to prevent the condition from worsening and to relieve pain  
- to promote recovery.  
Recognised first aid courses include those provided by St John Ambulance Australia, Australian Red Cross or equivalent.

OH&S:  
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:  
A thorough knowledge and understanding of first aid principles, sufficient to recognise emergency situations and then determine appropriate action which is consistent with first aid guidelines is required.  
Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the emergency response practices.  
Thorough knowledge of enterprise standard operating procedures is also required.
Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to save and preserve life.

Concurrent Assessment and Prerequisites:
The prerequisite for this competency is:
- PMAOH&S 100A  Follow OH&S policies and procedures.

Essential Knowledge:
Evidence of knowledge of all relevant procedures will include:
- principles of first aid
- cardiopulmonary resuscitation (CPR)
- hazard policies and procedures
- emergency, fire and accident procedures
- procedures for the use of personal protective clothing and equipment
- job procedures and work instructions.

Assessment Method, Context and Resource Implications:
Emergency response situations are relatively rare and experiences are less likely to be available than other standard operations.

Competence may be assessed as part of a recognised first aid training course, where trials, simulations, suitable simulators, case studies, or scenarios are used. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:
Respond To An Emergency Situation (PMA HAZ 200 A)

UNIT DESCRIPTOR:
This competency relates to the appropriate response to emergency situations.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1 Identify emergency situation | 1.1 Assess and communicate the nature, location and scope of emergency  
1.2 Raise alarm  
1.3 Locate and utilise emergency equipment |
| 2. Assess appropriate level of response | 2.1 Access hazard information as appropriate  
2.2 Assess frequency/duration/actual and potential outcome |
| 3. Notify responsible authorities | 3.1 Follow emergency reporting procedures  
3.2 Identify appropriate authorities and notify  
3.3 Clearly and unambiguously communicate information concerning the emergency |
| 4. Minimise the affect of the emergency | 4.1 Apply emergency procedures as appropriate  
4.2 Clear and secure the emergency area  
4.3 Access and use emergency response equipment |
| 5. Monitor emergency situation | 5.1 Process, record and communicate information to appropriate personnel  
5.2 Monitor corrective action procedures  
5.3 Communicate changes to the situation, to appropriate personnel |
| 4. Participate in review of emergency situation | 6.1 Assemble relevant information/documentation  
6.2 Audit procedures  
6.3 Identify potential causes of the emergency  
6.4 Evaluate the emergency response  
6.5 Recommend revisions to emergency response procedures where appropriate |
RANGE OF VARIABLES

Context
This competency applies to all operators.

Emergency situations may include:
- fire
- chemical or oil spill
- gas leak or vapour emission
- utilities failure.

Indicative functions include:
- containment of fire, chemical/oil spill or gas/vapour leak
- communication with internal and external personnel.

Indicative resources and equipment may include:
- personal protective equipment
  - such as breathing apparatus
- emergency response equipment
  - such as fire extinguishers, fire hoses, blankets
- standard procedures
- emergency services: police, fire, ambulance.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

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

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the emergency response practices.

Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE

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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to minimise the affect of an emergency situation.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- emergency situations are recognised and communicated promptly
- action is taken to ensure that the affects of the emergency situation are controlled promptly
- potential to involve others in the emergency is recognised and appropriately communicated
- emergency procedures are understood and followed

Concurrent Assessment and Prerequisites:
The prerequisite for this competency is:
- PMAOH&S 100A Follow OH&S policies and procedures.

Essential Knowledge:
Evidence of knowledge of all relevant workplace procedures will include:
- principles of operation of the emergency response equipment
- hazard policies and procedures
- emergency, fire and accident procedures
- procedures for the use of personal protective clothing and equipment
- job procedures and work instructions.

The competency will include the ability to:
- identify hazard and emergency signs and labels
- communicate details of an emergency situation clearly.

Assessment Method, Context and Resource Implications:
It is likely that candidates will have already demonstrated competence in many areas of plant operations under a wide range of operating conditions. Emergency response situations are relatively rare and experiences are less likely to be available than other operations.

Competence may be assessed partially on existing plant, similar plants, trials, or simulations, or by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Prepare Equipment For Emergency Response (PMA HAZ 201 A)*

**UNIT DESCRIPTOR:**
This competency relates to the preparation of equipment used to respond to emergencies.

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

Context
This competency applies to experienced operators or trained specialists.

Emergency response equipment may include:
- fire extinguishers
- fire hoses
- pumps
- branches, fittings and nozzles
- foam equipment/units
- personal protective clothing
- breathing apparatus
- deluge/safety showers.

Indicative functions include:
- inspections
  - visual
  - mechanical checks
- servicing
  - lubrication
  - pressure checks
  - refilling
- communication
  - maintenance
  - external authorities.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the equipment operation and servicing practices, sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.
Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the servicing practices.
Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
**EVIDENCE GUIDE:**

**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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.

**Concurrent Assessment and Prerequisites:**
The prerequisite for this competency is:
- PMAOH&S 100A  Follow OH&S policies and procedures.

**Essential Knowledge:**
Evidence of knowledge of all relevant workplace procedures will include:
- principles of operation of the equipment
- hazard policies and procedures
- emergency, fire and accident procedures
- procedures for the use of personal protective clothing and equipment
- job procedures and work instructions
- maintenance and servicing procedures.

**Assessment Method, Context and Resource Implications:**
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
### UNIT TITLE:

**Undertake Minor Maintenance** (PMA MAIN 201 A)

### UNIT DESCRIPTOR:
This competency covers the undertaking of minor maintenance activities on plant and equipment. It does not cover activities requiring a trade training.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify maintenance requirements</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Identify equipment variations/irregularities using observed data and plant records</td>
<td></td>
</tr>
<tr>
<td>1.2 Assess the urgency of the situation</td>
<td></td>
</tr>
<tr>
<td>1.3 Identify appropriate corrective action</td>
<td></td>
</tr>
<tr>
<td>1.4 Identify correct tools and materials</td>
<td></td>
</tr>
<tr>
<td>1.5 Assess the impact of the maintenance activity and communicate to appropriate personnel</td>
<td></td>
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<tr>
<td>1.6 Identify work permit requirements</td>
<td></td>
</tr>
<tr>
<td>2. Prepare for maintenance activity</td>
<td></td>
</tr>
<tr>
<td>2.1 Isolate and decontaminate the work area</td>
<td></td>
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<tr>
<td>2.2 Clear the area of obstructions and hazardous materials</td>
<td></td>
</tr>
<tr>
<td>2.3 Obtain the appropriate work permits and adhere to the requirements</td>
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</tr>
<tr>
<td>2.4 Communicate the impending maintenance activity to the appropriate personnel</td>
<td></td>
</tr>
<tr>
<td>3. Use appropriate tools, materials, methods and procedures</td>
<td></td>
</tr>
<tr>
<td>3.1 Use tools and maintenance techniques correctly</td>
<td></td>
</tr>
<tr>
<td>3.2 Use and interpret maintenance manuals and manufacturer’s information</td>
<td></td>
</tr>
<tr>
<td>4. Perform maintenance activity</td>
<td></td>
</tr>
<tr>
<td>4.1 Ensure correct tools and materials are available</td>
<td></td>
</tr>
<tr>
<td>4.2 Access all relevant information</td>
<td></td>
</tr>
<tr>
<td>4.3 Undertake maintenance activity in accordance with standard operating procedures, manufacturer’s specifications and work permit conditions</td>
<td></td>
</tr>
<tr>
<td>4.4 Restore equipment to normal working condition</td>
<td></td>
</tr>
<tr>
<td>4.5 Leave work area in a clean and safe condition</td>
<td></td>
</tr>
<tr>
<td>4.6 Ensure permits are signed off as appropriate</td>
<td></td>
</tr>
<tr>
<td>5. Test equipment</td>
<td></td>
</tr>
<tr>
<td>5.1 Test equipment according to standard operating procedures</td>
<td></td>
</tr>
<tr>
<td>5.2 Return equipment to service</td>
<td></td>
</tr>
<tr>
<td>5.3 Ensure equipment meets normal operating requirements</td>
<td></td>
</tr>
<tr>
<td>6. Record maintenance activity</td>
<td></td>
</tr>
<tr>
<td>6.1 Complete maintenance activity logs/plant history records</td>
<td></td>
</tr>
<tr>
<td>6.2 Report maintenance activity to appropriate personnel</td>
<td></td>
</tr>
<tr>
<td>6.3 Identify and report outstanding maintenance requirements to appropriate personnel</td>
<td></td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:

This competency is typically performed by experienced operators.

This competency unit includes minor maintenance in the following areas:

- operational maintenance
  - connection-disconnection of hoses
  - greasing, lubrication and lubricant systems
  - adjusting sealing glands
  - cleaning and changing filters
  - ‘nipping up’ flanges
  - general cleaning
- removal and replacement:
  - gland packing
  - changing blades or cutters
  - replacing gaskets
  - replacing /maintaining seals.

Typical information sources, observed data and plant records may include:

- plant data
- log sheets
- operational and performance reports
- condition monitoring information
- physical aspects such as noise, smell, feel and temperature
- performance trends
- planned maintenance schedules
- standard operating procedures (standard operating procedures)
- manufacturer’s instructions and service manuals
- plant description manuals.

Typical tools and equipment used may include:

- hand tools
- measuring and aligning equipment.

All operations are performed in accordance with standard operating procedures, codes of practice/codes of conduct for the enterprise.

OH&S:

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
Knowledge and Enterprise Requirements:
Knowledge and understanding of the equipment operation and maintenance practices, sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the maintenance practices.

Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:
Assessment should establish the ability to recognise normal equipment operation correctly and also the ability to recognise situations requiring action, the logical approach taken in determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.
Concurrent Assessment and Prerequisites:
The prerequisite for this competency is:
- PMAOH&S 100A  Follow OH&S policies and procedures.

Essential Knowledge:
Competence to include the ability to apply and explain
- principles of operation of the equipment to be maintained
- function and troubleshooting of major internal components and their problems
- typical causes of equipment failures and the service conditions which may increase maintenance
- types and nature of maintenance (preventative, predictive, corrective) uses, benefits and limitations
- urgency and timeliness factors in maintenance
- maintenance planning/scheduling/records systems
- identification of tools, materials and spare parts
- basic techniques for using and handling tools
- physical measurement, alignment and clearance principles
  as is relevant to the practical operation of equipment at that job level.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Commission/Recommission Plant (PMA MAIN 400 A)*

**UNIT DESCRIPTOR:**
This competency covers the participation in the commissioning or recommissioning of plant and associated equipment.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Contribute to the design of plant/equipment | Demonstrates the ability to:  
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 |
| 2. Participate in hazard and operability studies |  
2.1 Identify process conditions and apply to hazard and operability studies  
2.2 Undertake investigations following hazard studies  
2.3 Record and report findings |
| 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-conformances |
| 4. Conduct test runs/trials |  
4.1 Conduct trials/test runs  
4.2 Record and report performance data |
| 5 Evaluate results and identify modifications |  
5.1 Identify modifications and improvements required  
5.2 Complete documentation and report to appropriate personnel |
**RANGE OF VARIABLES:**

**Context:**
This competency is typically performed by experienced operators, 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.

Commissioning refers to the start-up of a 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 and maintenance personnel
- participation in hazard studies, which may include:
  - hazard and operability studies (HAZOP)
  - hazard analysis studies (HAZAN)
- precommissioning activities, which 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
- commissioning/recommissioning activities, which 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.

All operations are performed in accordance with standard operating procedures

**OH&S:**
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.
### Knowledge and Enterprise Requirements:

Knowledge and understanding of the equipment operation and commissioning/recommissioning practices, sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines, is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the commissioning/recommissioning practices.

Thorough knowledge of enterprise standard operating procedures is required.

### Assessment Focus:

Assessment should establish the ability to recognise normal equipment operation correctly and also the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

### Updating Information:

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

### EVIDENCE GUIDE:

#### 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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:

- early warning signs of equipment in need of attention/with potential problems are recognised
- action is taken to ensure equipment is returned to full performance in a timely manner
- obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
- items initiated are followed through until final resolution has occurred.
**Concurrent Assessment and Prerequisites:**

For many enterprises it will be appropriate for this unit to be assessed in conjunction with at least one of the following:

- PMAPROC300A Operate a unit of equipment
- PMAPROC301A Operate distillation units
- PMAPROC302A Operate reactors and reaction equipment
- PMAPROC303A Operate cracking furnaces
- PMAPROC304A Operate compressors.

This unit has a prerequisite of process competencies relevant to the process being operated. Such processes could include at least two of the following:

- PMAPROC201A Operate fluid flow equipment
- PMAPROC202A Operate fluid mixing equipment
- PMAPROC204A Use utilities and services
- PMAPROC205A Operate heat exchangers
- PMAPROC206A Operate separation equipment
- PMAPROC207A Operate powered separation equipment
- PMAPROC208A Operate chemical separation equipment
- PMAPROC210A Operate particulates processing equipment
- PMAPROC211A Operate manufacturing extruders.

**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

as is relevant to the practical operation of equipment at that job level.
**Assessment Method, Context and Resource Implications:**

It is likely that candidates will have already demonstrated competence in many areas of plant operations already under a wide range of operating conditions. Commissioning/recommissioning activities are relatively rare and experiences are less likely to be available than other operations.

Competence may be assessed partially on existing plant, similar plants, trials, or simulations, or by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

**Decommission Plant (PMA MAIN 401 A)**

## UNIT DESCRIPTOR:

This competency covers the participation in the decommissioning of plant and associated equipment.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 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 Access all relevant information  
1.4 Complete all appropriate documentation |
| 2. Participate in hazard and operability studies | 2.1 Identify process conditions and apply to hazard studies  
2.2 Undertake investigations following on from hazard studies  
2.3 Record and report findings |
| 3. Isolate and decontaminate equipment/unit | 3.1 Interpret and apply decommissioning plan  
3.2 Identify and use appropriate safety equipment and materials  
3.3 Isolate and decontaminate equipment components as required  
3.4 Dispose of contaminated materials or components as required  
3.5 Complete required documentation |
RANGE OF VARIABLES:

Context:

This competency is typically performed by experienced operators, likely to be the leaders of an operational team, usually working in conjunction with a project team, for the purpose of decommissioning plant.

Decommissioning refers to the removal from service of plant and equipment and its storage or disposal.

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:

- OH&S regulations
- codes of practice
- disposal procedures and regulations.

All operations are performed in accordance with standard operating procedures.

OH&S:

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:

Knowledge and understanding of the equipment operation and decommissioning practices, sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S, hazardous substances and environmental requirements is required along with an ability to implement them in a manner which is relevant to the decommissioning practices.

Thorough knowledge of enterprise standard operating procedures is required.
Assessment Focus:
Assessment should establish the ability to recognise normal equipment operation correctly and also the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

EVIDENCE GUIDE:
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 reasoning process behind the problem analysis and determining the required actions should be assessed. The emphasis should be on the ability to stay out of trouble rather than on recovery from a disaster.

Consistent performance at the required standard should be demonstrated. In particular look to see that:
• early warning signs of equipment in need of attention/with potential problems are recognised
• action is taken to ensure equipment is returned to full performance in a timely manner
• obvious problems in other plant areas are recognised and an appropriate contribution made to a solution
• items initiated are followed through until final resolution has occurred.

Concurrent Assessment and Prerequisites:
For many enterprises it will be appropriate for this unit to be assessed in conjunction with at least one of the following:
• PMAPROC300A Operate a unit of equipment
• PMAPROC301A Operate distillation units
• PMAPROC302A Operate reactors and reaction equipment
• PMAPROC303A Operate cracking furnaces
• PMAPROC304A Operate compressors.

This unit has a prerequisite of process competencies relevant to the process being operated. Such processes could include at least two of the following:
• PMAPROC201A Operate fluid flow equipment
• PMAPROC202A Operate fluid mixing equipment
• PMAPROC204A Use utilities and services
• PMAPROC205A Operate heat exchangers
• PMAPROC206A Operate separation equipment
• PMAPROC207A Operate powered separation equipment
• PMAPROC208A Operate chemical separation equipment
• PMAPROC210A Operate particulates processing equipment
• PMAPROC211A Operate manufacturing extruders.

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

as is relevant to the practical operation of equipment at that job level.

**Assessment Method, Context and Resource Implications:**

It is likely that candidates will have already demonstrated competence in many areas of plant operations already under a wide range of operating conditions. Decommissioning activities are relatively rare and experiences are less likely to be available than other operations.

Competence may be assessed partially on existing plant, similar plants, trials, or simulations, or by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

*Follow OH&S Policies And Procedures (PMA OH&S 100 A)*

### UNIT DESCRIPTOR:

This competency relates to the following of defined occupational health and safety policies and procedures. Procedures relate to the work being undertaken in order to ensure own safety and that of others in the workplace, within the scope of responsibilities.

### ELEMENT | PERFORMANCE CRITERIA
---|---
1. Follow workplace procedures for hazard identification risk assessment and control | 1.1 Identify hazards in the work area and report to designated personnel according to workplace procedures  
1.2 Accurately follow safe workplace procedures and safe work instructions for controlling risks  
1.3 Follow safe workplace procedures for dealing with accidents, fires and emergencies, whenever necessary within scope of responsibilities and competencies

2. Contribute to consultative arrangements for the management of occupational health and safety | 2.1 Raise occupational health and safety issues with designated personnel in accordance with workplace procedures and relevant requirements of occupational health and safety legislation  
2.2 Contribute to consultative arrangements for occupational health and safety management in the workplace within organisational procedures and scope of responsibilities and competencies
RANGE OF VARIABLES

Context
This competency describes occupational health and safety requirements applicable for all employees of the enterprise.

It is expected that this competency might be applicable in combination with other industry, occupation or workplace-specific competencies.

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 confined spaces, or environments subjected to heat, noise, dusts or vapours
- hazardous events such as:
  - accidents
  - fires
  - chemical spills
  - bomb scares.

Enterprise policies and procedures include those which directly or indirectly cover OH&S issues, such as:
- hazard policies and procedures
- standard operating procedures
- safety procedures
- work instructions
- emergency, fire and accident procedures
- personal protective clothing and equipment procedures.

It is expected that employees will be provided with clear directions, information, instruction, training and appropriate supervision regarding the relevant State/Territory OH&S legislation, codes of practice, workplace procedures and work instructions.

OH&S issues which may need to be raised by employees with designated personnel, may include:
- identification of hazards
- assessment of risk
- decisions on measures to control risk
- implementation of controls
- injury and incident investigation
- the development of OH&S policies and procedures.
Designated personnel for OH&S referral may include:
- employer
- supervisor
- employees elected as OH&S representatives
- other personnel with OH&S responsibilities.

Consultative arrangements for management of OH&S issues may involve:
- following OH&S 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.

**OH&S:**
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**
In these industries, which are characterised by high potential hazard, employees need to exercise their duty of care responsibilities not only within the general OH&S acts and regulations, but also within those applying to hazardous substances, dangerous goods and major hazards.

**Assessment Focus:**
Assessment focus should establish the ability to:
- identify hazardous situations
- deal with the situation appropriately
- communicate in OH&S matters.

**Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE

Critical Aspects:
Competence must be demonstrated in the ability to:
- identify hazards in the workplace
- report hazards identifies to the designated person
- locate, understand and follow workplace OH&S procedures.

Concurrent Assessment and Prerequisites:
Competence may need to be assessed in conjunction with units relating to communication competencies, particularly those relating to information provision.

Essential Knowledge:
Evidence of knowledge of:
- all relevant workplace procedures including:
  - hazard policies and procedures
  - emergency, fire and accident procedures
  - procedures for the use of personal protective clothing and equipment
  - hazard identification and issue resolution procedures
  - job procedures and work instructions
- significant hazards in the workplace (short and long term)
- symbols used for occupational health and safety signs
- awareness that OH&S issues are regulated by State/Territory Acts and regulations is required.

Competence to include the ability to:
- communicate OH&S issues
- locate and follow OH&S procedures.

Assessment Method, Context and Resource Implications:
Competence may be demonstrated working individually or under the guidance of, or as a member of, a team.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
# Implement And Monitor OH&S Policies And Procedures

**UNIT TITLE:**

*Implement And Monitor OH&S Policies And Procedures (PMA OH&S 200 A)*

**UNIT DESCRIPTOR:**

This competency covers the implementation and monitoring of defined occupational health and safety (OH&S) policies and procedures for a work group or area, within scope of responsibilities.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</table>
| 1. Provide information to the work group about occupational health and safety, legislation and the enterprise occupational health and safety policies, procedures and programs | 1.1 Accurately and clearly explain to the work group relevant provisions of occupational health and safety legislation and codes of practice  
1.2 Provide in a readily accessible manner, information on the enterprise occupational health and safety policies, procedures and programs and accurately and clearly explain them to the work group  
1.3 Regularly provide information about identified hazards and the outcomes of risk assessment and risk control procedures and accurately and clearly explain them to the work group |
| 2. Implement and monitor participative arrangements for the management of occupational health and safety | 2.1 Implement and monitor enterprise procedures for consultation over occupational health and safety issues to ensure that all members of the work group have the opportunity to contribute  
2.2 Deal with and promptly resolve issues raised through consultation or refer to the appropriate personnel for resolution in accordance with workplace procedures  
2.3 Promptly inform the work group of the outcomes of consultation over occupational health and safety issues |
| 3. Implement and monitor the enterprise procedures for identifying hazards and assessing risk | 3.1 Identify and report existing and potential hazards in the work area so that risk assessment and risk control procedures can be applied  
3.2 Involve the work group in a consultative approach to risk identification |
| 4. Implement and monitor the enterprise procedures for controlling risk | 4.1 Implement and monitor adherence to work procedures to control risk in accordance with workplace procedures  
4.2 Monitor existing risk control measures and report results regularly in accordance with workplace procedures  
4.3 Identify inadequacies in existing risk control measures in accordance with the hierarchy of control and report to designated personnel  
4.4 Identify inadequacies in resource allocation for implementation of risk control measures and report to designated personnel |
5. Implement the enterprise procedures for dealing with hazardous events

<table>
<thead>
<tr>
<th></th>
<th>5.1 Implement workplace procedures for dealing with hazardous events whenever necessary to ensure that prompt control action is taken</th>
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<tbody>
<tr>
<td></td>
<td>5.2 Investigate hazardous events to identify the cause in accordance with investigation procedures</td>
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<td></td>
<td>5.3 Implement control measures to prevent recurrence and minimisation of risk of hazardous events, based on the hierarchy of control, within scope of responsibilities and competence or alternatively refer to designated personnel for implementation</td>
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6. Implement and monitor the enterprise procedures for providing occupational health and safety training

<table>
<thead>
<tr>
<th></th>
<th>6.1 Identify occupational health and safety training needs, specifying gaps between occupational health and safety competencies required and those held by work group members</th>
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<tbody>
<tr>
<td></td>
<td>6.2 Make arrangements for fulfilling identified occupational health and safety training needs in both on and off-the-job training programs in consultation with relevant parties</td>
</tr>
</tbody>
</table>

7. Implement and monitor the enterprise procedure for maintaining occupational health and safety records

<table>
<thead>
<tr>
<th></th>
<th>7.1 Accurately and legibly complete occupational health and safety records for work area, in accordance with workplace requirements for occupational health and safety records and legal requirements for the maintenance of records of occupational injury and disease</th>
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<tbody>
<tr>
<td></td>
<td>7.2 Use aggregated information from the area's occupational health and safety records to identify hazards and monitor risk control procedures within work area according to procedures and within scope of responsibilities and competencies</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
This competency describes occupational health and safety requirements applicable for employees with supervisory responsibility, such as:
- employer
- supervisor
- employees elected as OH&S representatives
- other personnel with OH&S responsibilities.

It is expected that this competency might be applicable in combination with other industry, occupation or workplace-specific competencies.

This competency covers process manufacturing plants which may involve:
- workplace hazards such as:
  - chemicals and hazardous materials (short term and long term affects)
  - gases and liquids under pressure
  - moving machinery
  - materials handling
  - working at heights, in confined spaces, or environments subjected to heat, noise, dusts or vapours.
- hazardous events such as:
  - accidents
  - fires
  - chemical spills
  - bomb scares.

Competence is demonstrated in the context of an established enterprise OH&S system with related policies, procedures and programs. Enterprise policies and procedures include those which directly or indirectly cover OH&S issues, such as:
- hazard policies and procedures
- standard operating procedures
- safety procedures
- work instructions
- emergency, fire and accident procedures
- personal protective clothing and equipment procedures.

Consultation with employees should occur on OH&S issues, such as:
- identification of hazards
- identification of risk
- decisions on measures to control risk
- implementation of controls
- injury and incident investigation
- the development of OH&S policies and procedures.
**OH&S:**

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**

In these industries, which are characterised by high risk, employees need to exercise their duty of care responsibilities not only within the general OH&S acts and regulations, but also within those applying to hazardous substances, dangerous goods and major hazards.

**Assessment Focus:**

The assessment focus should establish the ability to provide clear directions, information, instruction, training, involvement in consultation and appropriate supervision regarding the relevant State/Territory OH&S legislation, codes of practice, workplace policies, procedures and work instructions.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
### EVIDENCE GUIDE:

#### Critical Aspects:

Competence must be demonstrated in the ability to:

- provide information and training on OH&S issues, policies and procedures
- be involved in consultation in OH&S issues, including establishment of policy and procedures, identification of hazards, assessment of risk, establishment of risk controls
- keep OH&S records complete, current and confidential.

#### Concurrent Assessment and Prerequisites:

Competence may need to be assessed in conjunction with units relating to communication competencies, particularly those relating to information provision.

#### Essential Knowledge:

Working knowledge of all relevant workplace procedures will include:

- consultation processes, either general or specific to occupational health and safety
- training and assessment
- specific hazard policies and procedures (including housekeeping and inspections)
- occupational health and safety information
- occupational health and safety record keeping
- maintenance of plant and equipment
- purchasing of supplies and equipment
- counselling/disciplinary/issue resolution processes.

Competence to include the ability to apply and explain:

- equal employment opportunity principles and practices for occupational health and safety
- other management systems and procedures for occupational health and safety
- literacy levels and communication skills of employees in the area of managerial responsibility and consequent suitable communication techniques (this may involve use of language other than English).
- 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.

#### Assessment Method, Context and Resource Implications:

Competence may be demonstrated working individually, or under the guidance of, or as a member of a team with, specialist occupational health and safety staff or managers.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
## UNIT TITLE:

**Establish, Maintain And Evaluate An OH&S System (PMA OH&S 400 A)**

## UNIT DESCRIPTOR:

This competency covers the establishment, maintenance and evaluation of the occupational health and safety (OH&S) system for the enterprise, in order to ensure that the workplace is, so far as is practicable, safe and without risks to the health of employees.

### ELEMENT | PERFORMANCE CRITERIA
--- | ---

1. **Establish and maintain the framework for the occupational health and safety system in the area of responsibility**

   1.1 Develop occupational health and safety policies which clearly express the commitment of the enterprise with respect to occupational health and safety within the area of managerial responsibility and indicate how relevant occupational health and safety legislation will be implemented.

   1.2 Clearly define and allocate occupational health and safety responsibilities and duties which will allow implementation and integration of the occupational health and safety system, and are included in job descriptions and duty statements for all relevant positions.

   1.3 Identify, seek and provide financial and human resources for the operation of occupational health and safety in a timely and consistent manner.

   1.4 Provide and explain information on the occupational health and safety system and procedures for the area of responsibility, in a form which is readily accessible to employees.

2. **Establish and maintain participative arrangements for the management of occupational health and safety**

   2.1 Establish and maintain appropriate consultative processes, with employees and their representatives in accordance with relevant occupational health and safety legislation and consistent with enterprise procedures.

   2.2 Deal with and resolve issues raised through participation and consultation, promptly and effectively in accordance with procedures for issue resolution.

   2.3 Provide information about the outcomes of participation and consultation in a manner accessible to employees.
### 3. Establish and maintain procedures for identifying hazards

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<tr>
<td>3.1</td>
<td>Correctly identify existing and potential hazards within the area of managerial responsibility, and identification confirmed in accordance with occupational health and safety legislation, codes of practice and trends identified from the occupational health and safety records system</td>
</tr>
<tr>
<td>3.2</td>
<td>Develop procedures for ongoing identification of hazards and integrate within systems of work and procedures</td>
</tr>
<tr>
<td>3.3</td>
<td>Appropriately monitor activities to ensure that this procedure is adopted effectively throughout area of managerial responsibility</td>
</tr>
<tr>
<td>3.4</td>
<td>Identify hazards at the planning, design and evaluation stages of any change in the workplace to ensure that new hazards are not created</td>
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### 4. Establish and maintain procedures for assessing risk

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<tr>
<td>4.1</td>
<td>Correctly assess the risk presented by identified hazards in accordance with occupational health and safety legislation and codes of practice</td>
</tr>
<tr>
<td>4.2</td>
<td>Develop procedures for ongoing assessment of risk and integrate within systems of work and procedures</td>
</tr>
<tr>
<td>4.3</td>
<td>Monitor activities to ensure that this procedure is adopted effectively throughout the area of managerial responsibility</td>
</tr>
<tr>
<td>4.4</td>
<td>Assess risks at the planning, design and evaluation stages of any change within the area of managerial responsibility to ensure that the risk from hazards is not increased</td>
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</table>

### 5. Establish and maintain procedures for controlling risks

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<tbody>
<tr>
<td>5.1</td>
<td>Develop and implement measures to control risks in accordance with the hierarchy of control, relevant occupational health and safety legislation, codes of practice and trends identified from the occupational health and safety records system</td>
</tr>
<tr>
<td>5.2</td>
<td>Implement interim solutions when measures to control a risk at its source are not immediately practicable, until a permanent control measure is developed</td>
</tr>
<tr>
<td>5.3</td>
<td>Develop procedures for ongoing control of risk, based on the hierarchy of control, and integrate within general systems of work and procedures</td>
</tr>
<tr>
<td>5.4</td>
<td>Monitor activities to ensure that the risk control procedure is adopted effectively throughout the area of managerial responsibility</td>
</tr>
<tr>
<td>5.5</td>
<td>Address risk control at the planning, design and evaluation stages of any change within the area of managerial responsibility</td>
</tr>
<tr>
<td>5.6</td>
<td>Identify inadequacies in existing risk control measures in accordance with the hierarchy of control, and ensure provision of resources enabling implementation of new measures according to appropriate procedures</td>
</tr>
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</table>
| 6. Establish and maintain organisational procedures for dealing with hazardous events | 6.1 Correctly identify potential hazardous events  
6.2 Develop procedures which would control the risks associated with hazardous events and meet any legislative requirements as a minimum, in consultation with appropriate emergency services  
6.3 Ensure provision of appropriate information and training to all employees to enable implementation of the correct procedures in all relevant circumstances |
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<tr>
<td>7. Establish and maintain an occupational health and safety training program</td>
<td>7.1 Develop and implement an occupational health and safety training program to identify and fulfil employees' occupational health and safety training needs as part of the enterprise general training program</td>
</tr>
<tr>
<td>8. Establish and maintain a system for occupational health and safety records</td>
<td>8.1 Establish and monitor systems for keeping occupational health and safety records to allow identification of patterns of occupational injury and disease within the area of managerial responsibility</td>
</tr>
</tbody>
</table>
| 9. Evaluate the occupational health and safety system and related policies, procedures and programs of the enterprise | 9.1 Assess the effectiveness of the occupational health and safety system and related policies, procedures and programs according to the enterprise aims with respect to occupational health and safety  
9.2 Develop and implement improvements to the occupational health and safety system to ensure more effective achievement of the aims of the enterprise with respect to occupational health and safety  
9.3 Assess compliance with occupational health and safety legislation and codes of practice to ensure that legal occupational health and safety standards are maintained as a minimum |
RANGE OF VARIABLES:
Context:
This competency describes occupational health and safety requirements applicable for those with managerial responsibilities. This may be as an employee or as an owner of a business. It is expected that this competency might be applicable in combination with other industry, occupation or workplace-specific competencies.

The competency is to be exhibited within area of managerial responsibility which might be an entire enterprise or department of an enterprise. Roles and responsibilities will vary greatly from enterprise to enterprise.

Relevant positions for implementing the occupational health and safety system will include managers, supervisors, occupational health and safety officer/manager and first aid officers.

Monitoring of activities may include review of written reports, performance appraisal or auditing procedures.

This competency covers process manufacturing plants which may involve:
- workplace hazards such as:
  - chemicals and hazardous materials (short term and long term affects)
  - gases and liquids under pressure
  - moving machinery
  - materials handling
  - working at heights, in confined spaces, or environments subjected to heat, noise, dusts or vapours
- hazardous events such as:
  - accidents
  - fires
  - chemical spills
  - bomb scares.

Competence is demonstrated in the context of an enterprise where the OH&S system with related policies, procedures and programs, may or may not be established. Where the OH&S system is established the role will relate to the maintenance and upkeep of the system.
Enterprise policies and procedures include those which directly or indirectly cover OH&S issues, such as:
- hazard policies and procedures
- standard operating procedures
- safety policy and procedures
- work instructions
- emergency, fire and accident policy and procedures
- personal protective clothing and equipment policy and procedures.

Consultation with employees should occur on OH&S issues, such as:
- identification of hazards
- estimation of risk
- decisions on measures to control risk
- implementation of controls
- injury and incident investigation
- the development of OH&S policies and procedures.

**OH&S:**

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

**Knowledge and Enterprise Requirements:**

Knowledge and application of relevant occupational health and safety legislation and codes of practice, particularly general duty of care requirements for the maintenance of records of occupational injury and disease, provision of information and training, and that dealing with occupational health and safety committees, health and safety representatives and issue resolution.

Knowledge and understanding of the processes for consultation including occupational health and safety committees, consultation with health and safety representatives, issue resolution procedures and participative/consultative procedures conducted by supervisory staff within the area of managerial responsibility.

**Assessment Focus:**

Assessment should establish the ability to establish policies and procedures, consistent with the relevant State/Territory acts, regulations and codes of practice, within the scope of responsibilities. Also to ensure that the policy and procedures are understood and followed, including the appropriate consultative processes.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
Critical Aspects:
Evidence of detailed knowledge of all relevant occupational health and safety legislation and codes of practice and how they will be implemented within the area of responsibility is required.

Evidence that the policies and procedures are being implemented, that sufficient resources, training, systems, explanation and consultation is being applied to deliver the OH&S policy and comply with the legislation.

Concurrent Assessment and Prerequisites:
For many enterprises, it will be appropriate for this unit to be assessed in conjunction with other team competencies.

Essential Knowledge:
• working knowledge of all relevant State/Territory acts, regulations and codes of practice, to enable enterprise policies, procedures and systems to be established in compliance, within role responsibilities

• knowledge of consultative processes, establishment, ongoing arrangements and obligations of those involved

• competence to include the ability to apply and explain
  – equal employment opportunity principles and practices for occupational health and safety
  – other management systems and procedures for occupational health and safety
  – literacy levels and communication skills of employees in the area of managerial responsibility and consequent suitable communication techniques (this may involve use of language other than English)
  – 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.

Assessment Method, Context and Resource Implications:
Competence may be demonstrated working individually, or under the guidance of, or as a member of a team with, specialist occupational health and safety staff, managers or consultants.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
# UNIT TITLE:

**Work In Accordance With An Issued Permit**

(PMA PER 200 A)

## UNIT DESCRIPTOR:
This competency unit is aimed to ensure that people working under a permit to work understand the system, know the limitations of the permit under which they are working and comply with all the requirements the permit.

## ELEMENT PERFORMANCE CRITERIA

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify the scope of the permit</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1 Identify the need for a work permit(s)</td>
<td></td>
</tr>
<tr>
<td>1.2 Identify the type of work permit required</td>
<td></td>
</tr>
<tr>
<td>1.3 Check that work to be done complies with the permit type</td>
<td></td>
</tr>
<tr>
<td>1.4 Check that the scope and location of work complies with the permit issued</td>
<td></td>
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<tr>
<td>2. Work in accordance with the permit</td>
<td></td>
</tr>
<tr>
<td>2.1 Use required hazard reduction/control measures (including personal protective equipment)</td>
<td></td>
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<tr>
<td>2.2 Comply with requirements of the permit including stand by personnel</td>
<td></td>
</tr>
<tr>
<td>2.3 Keep within the scope, location and timeframe specified in the permit</td>
<td></td>
</tr>
<tr>
<td>3 Complete permit to work</td>
<td></td>
</tr>
<tr>
<td>3.1 Extensions to the permit are formally sought and received when required</td>
<td></td>
</tr>
<tr>
<td>3.2 Permit is closed when work ceases for an extended period</td>
<td></td>
</tr>
<tr>
<td>3.3 New permits are obtained before work is recommenced</td>
<td></td>
</tr>
<tr>
<td>3.4 Permit is completed when job is completed</td>
<td></td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
This unit typically applies to all work done by maintenance staff and contractors and also to any other non process work performed on the plant.

To be competent, the person should be able to distinguish between situations requiring the major types of permit and to list the major requirements of each type of permit. The types of permit are to include:
- permit to work - cold work
- hot work
- confined space
- other special permits.

All operations are performed in accordance with standard procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the job.

Thorough knowledge of enterprise standard procedures is required.

Assessment Focus:
Assessment should establish the ability to follow procedures, recognise situations requiring action, and then take appropriate action such as immediately ceasing work and reporting the situation.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Critical Aspects:
The competent person should be aware of the types of tests which might be required for that type of permit and explain which changes to conditions which may lead to the permit being revoked before the job is completed. Types of tests/conditions to include:
- atmospheric/oxygen/breathability
- flammability/explosability
- toxicity/TWA
- temperature
- humidity.

Concurrent Assessment and Prerequisites:
This unit has no prerequisite competencies
It should be assessed in conjunction with:
- OH&S 1 Follow defined OH&S policies and procedures.

Individual enterprises may choose to add prerequisites and co-requisites relevant to their site and/or particular jobs

Essential Knowledge:
The competent person should also be aware of the regulatory framework (both internal and external) under which the permit system operates. They should be able to describe the impact of this framework on the particular job(s) they will be doing, and on themselves individually. The regulatory framework to include:
- OH&S
- EPA
- Worksafe
- licence requirements
- company policy and permit control systems.

Assessment Method, Context and Resource Implications:
Answers given to a theory test (written or oral) will be regarded as sufficient evidence in the first instance for a person to be regarded as competent. Any practical evidence from on the job observation which indicates a lack of competence will be sufficient to withdraw the assessment of competency. Evidence from a skills passport may be taken as prima facie evidence of generic competence and company/plant specific issues only need to be further trained in/assessed.

In all cases where practical assessment is used it will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the person.

Consistent on-the-job performance at the required standard should be demonstrated. In particular look to see that:
- standard procedures are followed
- deviations from permit conditions are recognised
- action specified in the permit/standard procedures is carried out.
UNIT TITLE:

**Issue Work Permits (PMA PER 300 A)**

**UNIT DESCRIPTOR**

This competency unit aims to ensure that personnel who issue work permits, understand the permit system, know the limitations of each permit and can make decisions regarding the need for and correct use of each permit.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Identify need for work permit | Demonstrates the ability to:  
1.1 Understand work permit system  
1.2 Identify and confirm with appropriate personnel the need for work permit  
1.3 Identify the correct permit for each situation |
| 2. Prepare work site |  
2.1 Undertake an inspection of the work site  
2.2 Identify OH&S and environmental requirements  
2.3 Prepare work site in accordance with standard operating procedures/specified work permit conditions  
2.4 Check permit status conditions and report to appropriate personnel  
2.5 Identify need for and carry out testing in accordance with standard operating procedures  
2.6 Complete appropriate documentation to standard |
| 3. Raise and issue work permits |  
3.1 Specify testing and safety requirements  
3.2 Check that work procedures are accessed and followed  
3.3 Complete and sign off all relevant documentation |
| 4. Monitor work for compliance |  
4.1 Undertake site inspections  
4.2 Monitor conditions and respond to changing conditions/circumstances  
4.3 Identify and act on incidences of non compliance |
| 5. Sign off work permit |  
5.1 Inspect job status  
5.2 Check that work undertaken satisfies permit conditions  
5.3 Ensure that work site is ready for normal working conditions  
5.4 Sign off documentation in accordance with standard operating procedures  
5.5 Communicate work site status to relevant personnel |
RANGE STATEMENT:

Context:
This unit is typically performed by experienced operators.

To be competent, the person should be able to distinguish between situations requiring the major types of permit and to list the major requirements of each type of permit. The types of permit are to include:

- permit to work - cold work
- hot work
- confined space/confined space entry
- other special permits
- evacuation
- vehicle entry

Indicative functions include:

- supervision/monitoring of contractors
- testing – types of testing include:
  - atmospheric
  - temperature
  - humidity
  - toxicity
  - combustibles
  - oxygen
- compliance with legislation/codes including:
  - OH&S
  - EPA
  - Worksafe
  - licence requirements
- internal permit control system.

OH&S:

All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them, in a manner which is relevant to the job.

Thorough knowledge of enterprise standard procedures and legislative requirements is assumed.
**Assessment Focus:**
Assessment should establish the ability to follow procedures, recognise situations requiring action, and then take appropriate action.

** Updating Information:**
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.

**Essential Knowledge:**
The competent person should be aware of the regulatory framework (both internal and external) under which permit systems operate.

The regulatory framework to include:
- OH&S
- EPA
- Worksafe
- licence requirements
- company policy and permit control systems.

**Assessment Method, Context and Resource Implications:**
A practical assessment is required under several different circumstances. In all cases it will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the person.

Consistent on-the-job performance at the required standard should be demonstrated. In particular look to see that:
- standard procedures are followed
- deviations from permit conditions are recognised
- action specified in the permit/standard procedures is carried out.
## UNIT TITLE:

*Monitor And Control Work Permits (PMA PER 301 A)*

## UNIT DESCRIPTOR

This competency unit aims to ensure that personnel who monitor and control work permits, understand the permit system and know the limitations of each permit.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</thead>
<tbody>
<tr>
<td>1. Maintain knowledge of current</td>
<td>1.1 Check permit status</td>
</tr>
<tr>
<td>permit status</td>
<td>1.2 Inform supervisors of permit status when appropriate</td>
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<td></td>
<td>1.3 Check permit conditions for all active permits</td>
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<td></td>
<td>1.4 Undertake site inspections</td>
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<tr>
<td></td>
<td>1.5 Comply with permit audits</td>
</tr>
<tr>
<td>2. Identify non-compliance</td>
<td>2.1 Understand conditions of active permits</td>
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<tr>
<td></td>
<td>2.2 Report and record incidents of non-compliance</td>
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<td></td>
<td>2.3 Take corrective action</td>
</tr>
<tr>
<td>3 Perform permit audits</td>
<td>3.1 Understand permit system</td>
</tr>
<tr>
<td></td>
<td>3.2 Complete checklists in accordance with standard procedures</td>
</tr>
<tr>
<td></td>
<td>3.3 Communicate audit findings to appropriate personnel</td>
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<tr>
<td></td>
<td>3.4 Complete documentation in accordance with standard procedures</td>
</tr>
</tbody>
</table>
RANGE OF VARIABLES:

Context:
This unit is typically performed by experienced operators.

To be competent, the person should be able to distinguish between situations requiring the major types of permit and to list the major requirements of each type of permit. The types of permit are to include:
- permit to work - cold work
- hot work
- confined space
- other special permits.

Indicative functions include:
- supervision/monitoring of contractors
- verification of:
  - permits
  - licences
  - tests
  - document control
  - compliance with legislation/codes.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them, in a manner which is relevant to the job.

Thorough knowledge of enterprise standard procedures and legislative requirements is required.

Assessment Focus:
Assessment should establish the ability to follow procedures, recognise situations requiring action, and then take appropriate action.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
  This unit is typically performed by experienced operators.

Critical Aspects:
  Consistent performance at the required standard should be demonstrated. In particular look to see that:
  • conditions requiring permits are understood
  • differences between permits are understood
  • deviations from desired conditions are recognised
  • action specified in the standard procedures is carried out.

Concurrent Assessment and Prerequisites:
  This unit has no prerequisite competencies.

  Individual enterprises may choose to add prerequisites and co-requisites relevant to their process.

Essential Knowledge:
  The competent person should be aware of the regulatory framework (both internal and external) under which permit systems operate.

  The regulatory framework to include:
  • OH&S
  • EPA
  • Worksafe
  • permit requirements
  • company policy and permit control systems.

Assessment Method, Context and Resource Implications:
  Answers given to a theory test (written or oral) will be regarded as sufficient evidence in the first instance for a person to be regarded as competent. Any practical evidence from on the job observation which indicates a lack of competence will be sufficient to withdraw the assessment of competency. Evidence from a skills passport may be taken as prima facie evidence of generic competence and company/plant specific issues only need to be further trained in/assessed.

  In all cases where practical assessment is used it will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the person.
Consistent on-the-job performance at the required standard should be demonstrated. In particular look to see that:

- standard procedures are followed
- deviations from permit conditions are recognised
- action specified in the permit/standard procedures is carried out.

**Essential Knowledge:**

The competent person should also be aware of the regulatory framework (both internal and external) under which the permit system operates. They should be able to describe the impact of this framework on the particular job(s) they will be doing, and on themselves individually. The regulatory framework to include:

- OH&S
- EPA
- Worksafe
- permit requirements
- company policy and permit control systems.

**Assessment Method, Context and Resource Implications:**

Answers given to a theory test (written or oral) will be regarded as sufficient evidence in the first instance for a person to be regarded as competent. Any practical evidence from on the job observation which indicates a lack of competence will be sufficient to withdraw the assessment of competency. Evidence from a skills passport may be taken as prima facie evidence of generic competence and company/plant specific issues only need to be further trained in/assessed.

In all cases where practical assessment is used it will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the person.

Consistent on-the-job performance at the required standard should be demonstrated. In particular look to see that:

- standard procedures are followed
- deviations from permit conditions are recognised
- action specified in the permit/standard procedures is carried out.
UNIT TITLE:  
*Follow Established Work Plan*  (PMA PLAN 100 A)

UNIT DESCRIPTOR:  
This unit of competency covers completing tasks individually or in a team context.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td></td>
<td>Demonstrates the ability to:</td>
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</tbody>
</table>
| 1. Identify work activities | 1.1 Identify team tasks if appropriate  
| | 1.2 Identify work activities that are allocated to the individual  
| | 1.3 Prioritise work activities as directed |
| 2. Organise daily work activities | 2.1 Break down work activities into small achievable components  
| | 2.2 Record activities |
| 3. Follow work plan | 3.1 Locate relevant standard operating procedures  
| | 3.2 Undertake tasks in accordance with schedule/plan  
| | 3.3 Maintain output in accordance with schedule/plan  
| | 3.4 Follow prescribed and routine work related sequences |
| 4. Modify work plan | 4.1 Identify changing needs/conditions  
| | 4.2 Seek assistance from relevant personnel when difficulties arise  
| | 4.3 Review tasks and priorities in line with changing needs/conditions with a change of instruction from appropriate personnel  
| | 4.4 Update work plan and communicate to appropriate personnel |
RANGE OF VARIABLES:

Context:
This competency includes the following indicative information sources and documentation:
- company policy and permit control systems.
- standard operating procedures
- material safety data sheets
- job cards
- maintenance logs
- plant drawings.

This competency includes items of equipment such as:
- plant equipment.

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the organisation’s information systems, procedures and equipment sufficient to plan daily work activities in order to meet timelines.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to giving and following routine instructions.

Thorough knowledge of enterprise standard operating procedures is required.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:
Context of Assessment:
- This competency is typically performed by plant operators, who may be working individually or in a team environment.

Critical Aspects:
- Competence must be demonstrated in the ability to identify work activities and prioritise work in order to meet time lines.

- Consistent performance at the required standard should be demonstrated. In particular look to see that:
  - activities are planned in accordance with instructions
  - relevant procedures are accessed and utilised in completing activities
  - time lines are adhered to
  - assistance is sought from relevant personnel when difficulties arise.

Concurrent Assessment and Prerequisites:
- This unit has the prerequisite competencies of:
  - PMAOH&S 100A  Follow OH&S policies and procedures
  - PMACOM100A  Relay and respond to information.

- Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
- Competence to include the ability to apply and explain:
  - importance of workplace documentation
  - enterprise quality and safety procedures.

Assessment Method, Context and Resource Implications:
- Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of the competency under a range of conditions. Where this is not practical, additional assessment techniques must be used.

- Competence may also be assessed by project, and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

- In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

**Schedule Production (PMA PLAN 300 A)**

**Unit Descriptor:**
This unit refers to the scheduling of production to meet operational requirements. It aims at ensuring that operators identify resource requirements, document, monitor and adjust schedules in response to operational variations.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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</thead>
</table>
| 1. Identify resources to meet production requirements | 1.1 Determine demand for product  
1.2 Access and verify information on orders, stocks and delivery  
1.3 Determine material requirements  
1.4 Determine human resource requirements |
| 2. Document schedules                       | 2.1 Determine production priorities  
2.2 Identify production opportunities (‘windows’)  
2.3 Develop production schedules in accordance with standard format  
2.4 Communicate and distribute production schedules to appropriate personnel |
| 3. Monitor production schedules              | 3.1 Monitor production output against schedule  
3.2 Identify variations between production and schedule  
3.3 Record operational variation and discuss with appropriate personnel  
3.4 Identify possible cause of variation |
| 4. Adjust Schedules                          | 4.1 Adjust schedules in response to operational variation  
4.2 Adjust schedules in response to unexpected events  
4.3 Adjust/amend document schedules and distribute to appropriate personnel  
4.4 Maintain product output in accordance with production requirements |
RANGE OF VARIABLES:

Context:
This competency is typically performed by experienced plant operators.
Indicative functions include:
- regular planning operations
- communication with
  - all relevant personnel
  - management and administration.

Unit content areas include responses to:
- immediate production needs
- future production needs
- reworking requirements.

All operations are performed in accordance with standard operating procedures.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process sufficient to recognise non-standard situations and then determine appropriate action which is consistent with operating guidelines is required.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to the use of the utilities and services.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise situations requiring action, the logical approach taken to determining the action required and then the ability to carry that action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

Context of Assessment:
This competency is typically performed by experienced plant operators, who may be working individually or in a team environment.

Critical Aspects:
Competence must be demonstrated in the ability to identify resource requirements, document, monitor and adjust schedules in response to operational requirements.
Consistent performance at the required standard should be demonstrated. In particular look to see that:

- resource requirements are correctly identified in accordance with production requirements
- schedules are planned for the most effective and efficient manner to meet operational requirements
- time lines are adhered to
- schedules are adjusted and resource requirements amended in response to operational variations
- variations to schedules are communicated and documented appropriately

Concurrent Assessment and Prerequisites:
This unit has the prerequisite competencies of:

- PMAOH&S 100A  Follow defined OH&S policies and procedures
- PMAPLAN100A  Follow established work plan
- PMACOM200A  Process and record information.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply and explain

- principles of use/application
- hazards of operations

as is relevant to the practical operation of equipment at that job level.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Contribute To Quality Processes (PMA QUAL 100 A)

UNIT DESCRIPTOR:
This competency covers the basic development of an awareness and application of the principles of quality.

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>PERFORMANCE CRITERIA</th>
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<tbody>
<tr>
<td>1. Identify plant goals</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td>1.1</td>
<td>Explain role of individual and of team in organisational structure</td>
</tr>
<tr>
<td>1.2</td>
<td>Construct flow chart of materials in and product out</td>
</tr>
<tr>
<td>2. Develop customer focus</td>
<td>2.1 Identify needs of external customers in line with enterprise priorities</td>
</tr>
<tr>
<td>2.2</td>
<td>Identify needs of internal customers</td>
</tr>
<tr>
<td>2.3</td>
<td>Explain use of customer feedback in bringing about improvement</td>
</tr>
<tr>
<td>3. Identify role of wastage in applying quality</td>
<td>3.1 Explain importance of reducing wastage of resources</td>
</tr>
<tr>
<td>3.2</td>
<td>Identify potential sources of wastage and approaches to minimising it</td>
</tr>
<tr>
<td>4. Participate in team to analyse an improvement proposal</td>
<td>4.1 Explain enterprise procedures for identifying and suggesting improvements</td>
</tr>
<tr>
<td>4.2</td>
<td>Explain the use of information in developing improvements</td>
</tr>
<tr>
<td>4.3</td>
<td>Discuss a proposed improvement with others in a team</td>
</tr>
</tbody>
</table>

RANGE OF VARIABLES:

Context:
This is a general competency that is performed by all operators in all areas of operation.
In large plants with multiple processes, it may apply to just one process in a plant if those processes do not interact with each other.
It is applied within the limits of standard operating procedures and stringent requirements of Occupational Health and Safety.

Knowledge and Enterprise Requirements:
Knowledge of the structure of the plant and organisational structure is required. A basic knowledge about the production process - what the plant produces, for whom and how, is required.

Assessment Focus:
Assessment should establish the ability to describe the role of the individual, the team in the overall operation of the plant.

Updating Information:
This competency is not expected to need rapid updating. Changes in competency standards related to quality should be noted.
EVIDENCE GUIDE:

Critical Aspects:
Consistent performance at the required standard should be demonstrated. In particular look to see that the operator:

- is able to describe the role of individual and team in terms of total production
- can describe main internal and external customers
- has ability to work as part of a team to discuss an improvement to a process
- can describe problems for the company that are caused by wastage of resources.

Concurrent Assessment and Prerequisites:
This unit has no prerequisite competencies.

Essential Knowledge:
Knowledge of relevant OH&S and environmental requirements and standard operating procedures is required

Assessment Method, Context and Resource Implications:
Competency in this unit may be assessed by observation over time and by verbal questioning. Questioning should be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.

The operator can also be asked to draw a basic production flow chart, or to comment on an existing chart.
# UNIT TITLE:

*Apply Quality Processes*  
(PMA QUAL 200A)

# UNIT DESCRIPTOR:

This unit applies to all employees who are required to participate in process improvement groups.

## ELEMENTS | PERFORMANCE CRITERIA

Demonstrates the ability to:

<table>
<thead>
<tr>
<th>ELEMENTS</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Document the quality process | 1.1 Identify existing sources of information  
1.2 Collect data  
1.3 Follow procedures for documenting the quality process  
1.4 Communicate information about quality to appropriate personnel |
| 2. Recognise problems that affect quality | 2.1 Distinguish possible problem areas  
2.2 Identify instances of variation  
2.3 Follow enterprise procedures for reporting and managing variations |
| 3. Participate in a team to analyse an improvement proposal | 3.1 Explain enterprise procedures for identifying and suggesting improvements  
3.2 Explain the use of information in developing improvements  
3.3 Analyse problem  
3.4 Suggest options for causes of problem  
3.5 Suggest options for improvement  
3.6 Discuss a proposed improvement with others in a team |

## RANGE STATEMENT:

**Context:**

The competency is typically performed by operators, who may be working individually or in a team environment. The competency unit applies to a range of processes and equipment.

In large plants with multiple processes, it may apply to more than one process if those processes interact with each other. It applies to all operators across all functions.

**OH&S:**

All operations are subject to stringent OH&S requirements.

**Knowledge and Enterprise Requirements:**

Knowledge and understanding of process, normal operating parameters, and product quality.

Knowledge of the relevant OH&S and environmental requirements and an ability to implement them is required.

Knowledge of enterprise standard operating procedures is required.

**Assessment Focus:**

Assessment should establish the ability to check that standards are being met, recognise and report a problem, and participate in a team.

**Updating Information:**

This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
EVIDENCE GUIDE:

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. In addition, look to see that:
- appropriate documenting of the quality improvement process is undertaken
- enterprise procedures for identifying and suggesting improvements are followed
- the operator is able to participate in a team discussion.

Concurrent Assessment and Prerequisites:
This unit has the prerequisite competencies of:
- PMAQUAL100a  Contribute to quality in the organisation
- PMACOM100A  Relay and respond to information
- PMAPROC101A  Make measurements.

Relevant process competencies may also be required.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply and explain
- principles of operation
- principles of recording and reporting
- isolate problem to item of equipment
- distinguish between:
  - material/chemical,
  - instrument,
  - equipment (electrical/mechanical),
  - maintenance
  - cause of problem

as is relevant to the process being investigated, and the ability to operate and report at that level.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the essential knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
UNIT TITLE:

Initiate Continuous Improvement (PMA QUAL 300A)

UNIT DESCRIPTOR
This unit applies to all employees who are required to be involved in process improvement initiatives.

<table>
<thead>
<tr>
<th>ELEMENTS</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify areas for improvement</td>
<td>Demonstrates the ability to:</td>
</tr>
<tr>
<td></td>
<td>1.1 Monitor workflow against agreed standards</td>
</tr>
<tr>
<td></td>
<td>1.2 Identify variances against agreed standards</td>
</tr>
<tr>
<td></td>
<td>1.3 Identify issues affecting output and quality</td>
</tr>
<tr>
<td></td>
<td>1.4 Record non conformance in accordance with company requirements</td>
</tr>
<tr>
<td>2. Identify strategies for improvement</td>
<td>2.1 Analyse problems/areas for improvement</td>
</tr>
<tr>
<td></td>
<td>2.2 Utilise appropriate quality tools and techniques (including planning, controlling and problem solving tools) for identifying areas for improvement</td>
</tr>
<tr>
<td></td>
<td>2.3 Identify and take into account external factors</td>
</tr>
<tr>
<td></td>
<td>2.4 Identify required changes to standards and procedures</td>
</tr>
<tr>
<td></td>
<td>2.5 Identify strategies for improvement</td>
</tr>
<tr>
<td>3. Communicate recommendations</td>
<td>3.1 Prepare report on recommendations</td>
</tr>
<tr>
<td></td>
<td>3.2 Present recommendations to appropriate personnel</td>
</tr>
<tr>
<td></td>
<td>3.3 Follow up recommendations</td>
</tr>
<tr>
<td>4. Participate in implementing process improvement strategies</td>
<td>4.1 Implement changes in system and procedures</td>
</tr>
<tr>
<td></td>
<td>4.2 Monitor performance improvements</td>
</tr>
<tr>
<td></td>
<td>4.3 Evaluate results of improvements</td>
</tr>
</tbody>
</table>
RANGE STATEMENT:

Context:
The competency is typically performed by experienced operators, who may be working individually or in a team environment. The competency unit applies to a wide range of processes and equipment.

In large plants with multiple processes, it may apply to more than one process if those processes interact with each other. It applies to all operators across all functions.

OH&S:
All operations are subject to stringent OH&S requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OH&S requirements, the OH&S requirements take precedence.

Knowledge and Enterprise Requirements:
Knowledge and understanding of the process, normal operating parameters, and product quality to recognise non-standard situations.

Knowledge of the relevant OH&S and environmental requirements is required along with an ability to implement them in a manner which is relevant to determining the corrective action and provision of recommendations.

Thorough knowledge of enterprise standard operating procedures is required. Some appreciation of the plant’s business goals is required as a basis for decision making and action.

Assessment Focus:
Assessment should establish the ability to recognise and define a problem, the ability to analyse and determine the fundamental cause and then the ability to carry the corrective action out efficiently to completion.

Updating Information:
This competency is not expected to need rapid updating, however, learning resources supporting this competency will need to be updated with changes in technology, procedures and government regulations.
**EVIDENCE GUIDE:**

**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. In addition, look to see that:

- appropriate strategies are recommended to improve efficiency and productivity within team/department to achieve business goals and key performance indicators
- improved practices and procedures are implemented
- improvements are documented and reviewed.

The ability to select and apply techniques such as the following should be evidenced:

- fishbone diagrams/cause and effect diagrams
- logic tree
- process logic/process requirements
- similarity/difference analysis
- Pareto analysis
- forcefield/SWAT analysis.

**Concurrent Assessment and Prerequisites:**
This unit has the prerequisite competencies of:

- PMAQUAL100A Contribute to quality in the organisation
- PMAQUAL200A Apply Quality Processes
- PMACOM100A Relay and respond to information
- PMACOM200A Process and record information
- PMAPROC101A Make measurements.

Relevant process competencies may also be required

Individual enterprises may choose to add other prerequisites relevant to their process.
**Essential Knowledge:**

Competence to include the ability to apply and explain
- principles of operation
- physics of operation
- chemistry of operation (where relevant)
- isolate problem to item of equipment
- distinguish between:
  - material/chemical,
  - instrument,
  - equipment (electrical/mechanical),
  - maintenance
  - cause of problem

as is relevant to the process being investigated and the ability to operate and problem solve at that level.

**Assessment Method, Context and Resource Implications:**

Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant /and or project and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the essential knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
**UNIT TITLE:**

*Develop And Monitor Quality Systems*  
*(PMA QUAL 400 A)*

**UNIT DESCRIPTOR**

This competency covers the establishment, maintenance and evaluation of quality systems for a complete production area and or plant.

<table>
<thead>
<tr>
<th>ELEMENTS</th>
<th>PERFORMANCE CRITERIA</th>
</tr>
</thead>
</table>
| 1. Establish and maintain framework for successful quality system | 1.1 Develop relevant policies which demonstrate the commitment of the enterprise to quality and a culture of improvement  
1.2 Define and allocate responsibilities in quality system  
1.3 Consult with key personnel to define role of procedures in the quality system  
1.4 Seek and provide financial and human resources to allow thorough implementation of quality system  
1.5 Develop system for communicating quality message and culture in the organisation |
| 2. Establish and maintain quality documentation system | 2.1 Identify quality documentation required including records of improvement plans and initiatives  
2.2 Prepare and maintain quality documentation and keep data records  
2.3 Maintain document control system |
| 3. Implement structured training program in accordance with quality system requirements. | 3.1 Analyse roles and duties of relevant personnel  
3.2 Identify training needs in relation to quality  
3.3 Identify training programs to meet these needs  
3.4 Implement the training program  
3.5 Develop and maintain training records |
| 4. Evaluate the quality system. | 4.1 Undertake regular audits of the quality system, its policies and procedures  
4.2 Implement improvements in the quality system |
### RANGE OF VARIABLES

**Context:**
This competency is typically performed by experienced personnel, team leaders and supervisors.

Quality audits and evaluations may be undertaken as an individual or as part of a team.

**OH&S:**
This competency is applied within the limits of OH&S requirements.

**Knowledge and Enterprise Requirements:**
Knowledge and understanding of the organisation’s quality systems and appropriate national and international quality standards and protocols.

Knowledge of the relevant OH&S and environmental requirements, and detailed knowledge of enterprise standard operating procedures is required.

An appreciation the plant’s business goals and key performance indicators is required as a basis for decision making and action.

**Assessment Focus:**
Assessment should establish the ability for autonomous decision making and accountability, providing direction for others and applying specialist knowledge to quality initiatives.

**Updating Information:**
This competency is not expected to need rapid updating. Changes in competency standards related to quality should be noted.
EVIDENCE GUIDE:

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. In addition, look to see that:
• effective maintenance and evaluation of quality systems is carried out
• relevant staff training programs are implemented
• adequate quality documentation is produced including policies and procedures.

Concurrent Assessment and Prerequisites:
This unit has the prerequisite competencies of:
• PMAQUAL100a Contribute to quality in the organisation  
• PMAQUAL200A Apply Quality Processes  
• PMAQUAL300A Initiate continuous improvement  
• PMACOM100a Relay and respond to information  
• PMACOM200A Process and record information.  
• BSZCAT1A Prepare for/deliver/review training (category 1).

Relevant process competencies may be decided by the enterprise. In particular, it is advisable to concurrently undertake PMAPROC400A: Optimise operating systems.

Individual enterprises may choose to add other prerequisites relevant to their process.

Essential Knowledge:
Competence to include the ability to apply and explain
• the principles of process improvement
• the principles of policy and procedure development
• the principles of data management and documentation.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation of the quality system over time. Where this is done, the timeframe must allow for adequate assessment of operations under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may be assessed by project, and or a range of case studies and/or by demonstration exercises. A combination of these techniques should be used to ensure that the competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge.
Overlay competency:

*Participate In Team To Achieve Designated Goals (BSA TEM 101A)*

Original Unit Details

**Source:**
National Clerical - Administrative Competency Standards (Private Sector) Third Edition (BSA)

**Number:**
TEM 101

**Title:**
Participate in a team to achieve designated tasks

**Unit Descriptor:**
This unit applies to employees who complete allocated tasks in a team context within enterprise guidelines and timelines.

**Elements and Performance Criteria:**
These are identical to the original unit.

**Range of Variables:**
Within the process manufacturing industry, employees who work within a team structure with limited discretionary powers.

Employees work within enterprise policies and procedures.

**Evidence Guide**

**Critical Aspects:**
These are identical to the original unit.

**Concurrent Assessment and Prerequisites:**
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

**Underpinning knowledge and skills:**
These are identical to the original unit.

**Assessment Method, Context and Resource Implications:**
These are identical to the original unit.

**Key Competencies:**
These are identical to the original unit.
Overlay competency:

*Participate In The Allocation And Completion Of Team Tasks (BSA TEM 201A)*

**Original Unit Details**

**Source:**
National Clerical - Administrative Competency Standards (Private Sector) Third Edition (BSA)

**Number:**
TEM 201

**Title:**
Participate in allocation and completion of team tasks

**Unit Descriptor:**
This unit applies to employees who participate in identifying team goals, work in a team to achieve the goals and complete own tasks within enterprise guidelines, standard operating procedures and timelines.

**Elements and Performance Criteria:**
These are identical to the original unit.

**Range of Variables**
This unit is typically performed by employees who work within a team work structure with some discretionary powers to the extent of their designated duties/tasks.

Employees work within enterprise policies and procedures.

Team goals - individual, departmental, enterprise - are given.

Tasks are allocated to team and individual members.

**Evidence Guide**

**Critical Aspects:**
These are identical to the original unit.

**Concurrent Assessment and Prerequisites:**
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

**Underpinning knowledge and skills:**
These are identical to the original unit.

**Assessment Method, Context and Resource Implications:**
These are identical to the original unit.

**Key Competencies:**
These are identical to the original unit.
Overlay competency:

Negotiate With Team Members To Allocate & Complete Tasks (BSA TEM 301A)

Original Unit Details
Source:
National Clerical - Administrative Competency Standards (Private Sector) Third Edition (BSA)

Number:
TEM 301

Title:
Negotiate with team members to allocate and complete tasks to achieve team goals

Unit Descriptor:
This unit applies to employees who participate in identifying team goals and timelines, negotiate with team to allocate tasks and ensure that goals and timelines are met in accordance with enterprise guidelines, standard operating procedures and timelines.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables:
This unit is typically performed by more experienced operators who work in a team structure and may co-ordinate team functions within designated goals.

Indicative functions include: identification and allocation of team tasks to meet goals, monitoring and reviewing completion of tasks, providing support to team members to ensure completion of tasks.

Employees work within enterprise policies and procedures.

Team goals - individual, departmental, enterprise - are given.

Evidence Guide

Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

Underpinning knowledge and skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit.

Key Competencies:
These are identical to the original unit.
Establish And Manage Effective Workplace Relationships (BSXFMI303A)

Overlay competency:

Establish And Manage Effective Workplace Relationships (BSXFMI303A)

Original Unit Details
Source: Generic Management Competency Standards for Frontline Management
Number: FMI303A
Title: Establish and manage effective workplace relationships

Unit Descriptor:
This unit applies to employees who play an important role in developing and maintaining positive relationships in internal and external environments so that customers, suppliers and the organisation achieve planned outcomes.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables:
This competency is typically performed by experienced operators in conjunction with a team.
Indicative functions include team planning, conflict resolution, negotiation with individuals and groups, implementing workplace access and equity policies, presentations and customer/supplier reviews.
Enterprise policies and procedures and OH&S and other legislative requirements must be complied with.
Organisational goals, eg, team, section and enterprise, must be adhered to.

Resources:
- performance targets, key performance indicators
- production targets/timelines
- budgets, human resources & materials.

Evidence Guide
This competency is performed by employees who have frontline management responsibilities and is typically performed by more experienced operators who work in a team structure and may supervise team functions within designated business goals.

Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

Underpinning knowledge and skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit.

Key Competencies:
These are identical to the original unit.
Overlay competency:

*Participate In, Lead And Facilitate Work Teams (BSXFMI304A)*

**Original Unit Details**

**Source:**
Generic Management Competency Standards for Frontline Management

**Number:**
FMI304A

**Title:**
Participate in, lead and facilitate work teams

**Unit Descriptor:**
This unit applies to employees who have 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.

**Elements and Performance Criteria:**
These are identical to the original unit.

**Range of Variables:**
This competency is typically performed by experienced operators who supervise a team. Indicative functions include: team planning, conflict resolution, negotiation with individuals and groups, counselling, coaching and mentoring individuals, monitoring and reviewing team performance. Enterprise policies and procedures and OH&S requirements must be complied with. Organisational goals, eg, team, section and enterprise, must be adhered to.

**Resources:**
- performance targets, key performance indicators
- awards, enterprise agreements and other related personnel legislative requirements
- budgets, human resources and materials.

**Evidence Guide**
This competency is performed by employees who have frontline management responsibilities and is typically performed by more experienced operators who may supervise team functions within designated business goals.

**Critical Aspects:**
These are identical to the original unit.

**Concurrent Assessment and Prerequisites:**
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

**Underpinning knowledge and skills:**
These are identical to the original unit.

**Assessment Method, Context and Resource Implications:**
These are identical to the original unit.

**Key Competencies:**
These are identical to the original unit.
Overlay competency:

Manage Operations To Achieve Planned Outcomes (BSXFMI305A)

Original Unit Details
Source:
Generic management competency standards for frontline management

Number:
FMI305A

Title:
Manage operations to achieve planned outcomes.

Unit Descriptor:
This unit applies to employees who are actively engaged in the planning, implementing, monitoring and recording performance to achieve the business plans of the team/organisation. This pivotal role is carried out to create safe, efficient and effective products and services to customer satisfaction within the organisation’s productivity and profitability plans.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables
This competency is typically performed by experienced operators in conjunction with others.
Indicative functions include: regular planning of operations to meet production schedules, typically for a team/shift on a weekly or monthly basis; manages team resources within budgets; implements strategies to eliminate/minimise resource waste; preparations for planned shutdowns or turnarounds; response to unplanned shutdowns/emergencies. Enterprise policies and procedures and OH&S requirements must be complied with. Organisational goals, eg, team, section and enterprise, must be adhered to.

Resources:
- production schedules, maintenance schedules
- production targets/timelines
- budgets, human resources and materials.

Evidence Guide
Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

Underpinning knowledge and skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit.

Key Competencies:
These are identical to the original unit.
Facilitate And Capitalise On Change And Innovation

Overlay competency:

*Facilitate And Capitalise On Change And Innovation*  *(BSXFMI310A)*

**Original Unit Details**

**Source:**
Generic Management Competency Standards for Frontline Management

**Number:**
FMI310A

**Title:**
Facilitate and capitalise on change and innovation

**Unit Descriptor:**
This unit applies to employees who have 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.

**Elements and Performance Criteria:**
These are identical to the original unit.

**Range of Variables**
This competency is typically performed by experienced operators who supervise a team. Indicative functions include: change management, team planning for implementation of change, conflict resolution, negotiation with individuals and groups, counselling, coaching and mentoring individuals, monitoring and reviewing team performance.

Enterprise policies and procedures and OH&S requirements must be complied with.

Organisational goals, eg, team, section and enterprise, must be adhered to.

**Resources:**
- performance targets, key performance indicators
- awards, enterprise agreements and other related personnel legislative requirements
- budgets, human resources and materials.

**Evidence Guide**
This competency is performed by employees who have frontline management responsibilities and is typically performed by more experienced operators who supervise a team within designated business goals.

**Critical Aspects:**
These are identical to the original unit.

**Concurrent Assessment and Prerequisites:**
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

**Underpinning knowledge and skills:**
These are identical to the original unit.

**Assessment Method, Context and Resource Implications:**
These are identical to the original unit.

**Key Competencies:**
These are identical to the original unit.
Overlay competency:

Contribute To The Development Of A Workplace Learning Environment (BSXFMI311A)

Original Unit Details

Source:
Generic management competency standards for frontline management

Number:
FMI311A

Title:
Contribute to the development of a workplace learning environment

Unit Descriptor:
This unit applies to employees who play 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.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables:
This competency is typically performed by experienced operators who supervise a team. Indicative functions include: training needs analysis, planning and provision of learning opportunities, coaching and mentoring, monitoring team learning, utilisation and currency of team competencies, development of team competencies in line with business plans/human resource planning. Enterprise policies and procedures and OH&S requirements must be complied with. Organisational goals, eg, team, section and enterprise, must be adhered to.

Resources:
- performance targets, key performance indicators
- personnel data
- budgets, human resources & materials.

Evidence Guide
This competency is performed by employees who have frontline management responsibilities and is typically performed by more experienced operators who supervise a team within designated business goals.

Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

Underpinning knowledge and skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit.

Key Competencies:
These are identical to the original unit.
Collect And Prepare Standard Samples

Overlay competency:

Collect And Prepare Standard Samples

Original Unit Details

Source:
Laboratory assistants industry standards

Number:
Lab 5

Title:
Collect and prepare standard samples

Unit Descriptor:
This competency covers the ability of personnel to collect representative samples and prepare, preserve and store them following standard procedures and maintaining sample integrity.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables
Within the process manufacturing industry (chemical, hydrocarbons and oil refining sectors), this unit applies to operators and laboratory assistants’ jobs/equipment/procedures.

Samples taken include solids, liquids, and gases that involve raw materials, products, by-products, waste or naturally occurring substances. Their exact nature will depend on the ambit of the laboratory and enterprise.

Regulations governing the storage of dangerous goods apply.

Standard procedures include:
- blending
- coning and quartering
- crushing
- dilution
- grinding
- purification
- separation
- sieving.

All tests are carried out according to standard procedures.

Samples requiring analysis by external laboratories are forwarded in accordance with relevant regulations and procedures.
Unwanted samples are disposed of in accordance with laboratory procedures and legislative requirements.

Where non-standard or specialised sampling is required, it is generally performed under supervision.

Evidence Guide

Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
Nil

Essential knowledge and skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure competency is adequately assessed.

In all cases, it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
Perform Qualitative And Quantitative Tests

Overlay competency:

Perform Qualitative And Quantitative Tests (PMA TEST 201 A)

Original Unit Details

Source: Laboratory assistants industry standards

Number: Lab 6

Title: Perform qualitative and quantitative tests

Unit Descriptor:
This competency relates to personnel who conduct qualitative and quantitative chemical and/or physical tests under supervision, to obtain reliable data.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables
Within the process manufacturing industry (chemical, hydrocarbons and oil refining sectors), this unit applies to operators, laboratory assistants and laboratory technicians’ jobs/equipment/procedures.

Tests are performed using manual, semi or fully automated procedures involving techniques and materials consistent with laboratory classification and accreditiation.

All tests are performed in accordance with established laboratory procedures and have predetermined protocols that need to be followed.

The nature of the tests and the range of work will depend on the scope of the laboratory and the nature of the enterprise.

Observations include microscopic examination and visual examination of samples, specimens and packaging.

Qualitative tests include:
- pH
- trace elements
- specific ions
- colour
- appearance.
Quantitative tests could include
  • calorimetry (transition temperature)
  • gas liquid and high pressure chromatography
  • spectrometer
  • viscosity
  • volumetric analysis.

**Evidence Guide**

**Critical Aspects:**
These are identical to the original unit.

**Concurrent Assessment and Prerequisites:**
Nil

**Essential knowledge and skills:**
These are identical to the original unit.

**Assessment Method, Context and Resource Implications:**
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
Operate Laboratory Equipment And Instruments (PMA TEST 202 A)

Overlay competency:

Operate Laboratory Equipment And Instruments (PMA TEST 202 A)

Original Unit Details

Source:
Laboratory assistants industry standards

Number:
Lab 4

Title:
Operate laboratory equipment and instruments

Unit Descriptor:
This competency relates to personnel who perform safety checks, check and adjust settings of basic equipment and perform calibration checks using standard procedures.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables
Within the process manufacturing industry (chemical, hydrocarbons and oil refining sectors), this unit applies to operators, laboratory assistants and laboratory technicians’ jobs/equipment/procedures.

Laboratory instruments covered include:
- analytical balances
- auto-pipettes
- autotitrators
- burettes
- colorimeters/spectrophotometers
- glassware
- pH meters
- tensiometers.

Evidence Guide

Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
There are no prerequisites for this unit.

Individual enterprises may choose to add prerequisites to their process.
**Essential knowledge and skills:**
These are identical to the original unit.

**Assessment Method, Context and Resource Implications:**
Competence in this unit may be assessed by observation over time on an operating plant. Where this is done, the timeframe must allow for adequate assessment of operation under all normal and a range of abnormal conditions. Where this is not practical, additional assessment techniques must be used.

Competence may also be assessed by use of a suitable simulation and/or pilot plant and/or a range of case studies/scenarios. A combination of these techniques should be used to ensure competency is adequately assessed.

In all cases it is expected that the practical assessment will be supported by targeted questioning to assess the underpinning knowledge. Questioning will be undertaken in such a manner as is appropriate to the required language and literacy levels of the operator.
Overlay competency:

*Prepare For, Deliver And Review Training (BSX0008/1, BSX0008/2, BSX0008/3)*

**Original Unit Details**

**Source:**
Workplace trainer competency standards

**Title:**
There are 3 linked units: Prepare for training, Deliver training and Review training.

**Unit Descriptor:**
These units apply to all employees who raise the levels of competency in the workforce by providing on-the-job structured training.

**Elements and Performance Criteria:**
These are identical to the original unit.

**Range of Variables**
Within the process manufacturing industry, this unit applies to all employees who provide training in the workplace but for whom the training function is not a major part of their job.

They may provide training infrequently or regularly within a structured training context on a one to one or small group basis.

**Evidence Guide**

**Critical Aspects:**
These are identical to the original unit.

**Concurrent Assessment and Prerequisites:**
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

**Essential Knowledge and Skills:**
These are identical to the original unit.

**Assessment Method, Context and Resource Implications:**
These are identical to the original unit.

**Key Competencies:**
These are identical to the original unit.
Overlay competency:

Original Unit Details

Source:
Workplace trainer competency standards: category 2 workplace trainers

Title:
There are 4 linked units: Prepare for training, Deliver training, Assess trainees, and Review and promote training.

Unit Descriptor:
These units apply to those people for whom training is a large part of their job, or their full job function within a structured training context.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables
Within the process manufacturing industry, this unit applies to those people for whom training is a large part of their job, or their full job function within a structured training context.

Training provision may range from one-to-one, small group or large group training. It may include both on- and off-the-job training provision.

In making an assessment decision about trainee competence in the unit ‘assess trainees’, the trainer may be assisted by a person with appropriate technical skills.

Evidence Guide

Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

Train 200: Prepare for training (category 1), and Assess 200: Conduct assessment in accordance with an established assessment procedure/plan and review assessment, are prerequisite competencies.

Essential Knowledge and Skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit.

Key Competencies:
These are identical to the original unit.
Overlay competency:

Workplace Assessor (BSX0022/1, BSX0022/2)

Original Unit Details

Source:
Assessment competency standards

Title:
There are two linked units:
- Conduct assessment in accordance with established assessment procedure
- Plan and review assessment.

Unit Descriptor:
These units apply to employees who conduct assessment in accordance with an assessment procedure established by the industry, enterprise or training establishment.

Elements and Performance Criteria:
These are identical to the original unit.

Range of Variables
Within the process manufacturing industry, employees who conduct assessment work with limited discretionary powers within a structured assessment situation.

Employees with these competencies have access to guidance and support from more experienced assessors within the industry.

Evidence Guide

Critical Aspects:
These are identical to the original unit.

Concurrent Assessment and Prerequisites:
This unit of competency may be assessed in conjunction with other units that form part of a job role or function.

Essential Knowledge and Skills:
These are identical to the original unit.

Assessment Method, Context and Resource Implications:
These are identical to the original unit.

Key Competencies
These are identical to the original unit.