



Australian Government

PMAOPS300B Operate a production unit

Release 2

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Modification History

Release 2 – Minor clarification to descriptor, minor changes to Skills and Knowledge and Range, and editorial corrections.

Unit Descriptor

This competency covers the operation of an enterprise specific unit of a production plant, which is not otherwise described by other units in this Training Package. The operations technician is expected to demonstrate a significant understanding of the process and the equipment operation. The plant unit includes the operation of other plant items which are integral to the operation of the plant unit.

Application of the Unit

This unit applies where the plant technician operates a unit of plant which is not otherwise described. The other 300 series process competencies should be used as an indicative guide as to the coverage and complexity of the operation.

The operations technician would:

- identify and rectify operational problems
- predict the potential impact of the production unit output on the operation of the whole plant
- facilitate output changes.

Generally the operations technician would operate independently in a plant with local control or in liaison with the control room operator in a plant with Distributed Control System (DCS) type controls. In the case of large complex plant, the operations technician would be part of a team during startup and shutdown procedures. The operations technician would be expected to be capable of performing all parts of this unit. At all times they would be liaising and cooperating with other members of the team.

This unit does not include the operation of any packaged unit (regardless of its engineering complexity) which is covered by *MSAPMOPS100A Use equipment*.

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

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

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

Elements and Performance Criteria

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|---|------------------------------|-----|--|
| 1 | Prepare for work | 1.1 | Identify work requirements |
| | | 1.2 | Identify and control hazards |
| | | 1.3 | Coordinate with appropriate personnel |
| 2 | Start up unit | 2.1 | Perform pre-start-up checks |
| | | 2.2 | Start up individual items of equipment and the entire unit |
| | | 2.3 | Start up normally and after maintenance |
| | | 2.4 | Build rate steadily |
| | | 2.5 | Stabilise operation to produce specified rate and quality within minimum time |
| 3 | Monitor and control the unit | 3.1 | Complete routine checks, logs and paperwork |
| | | 3.2 | Frequently and critically monitor all plant throughout shift |
| | | 3.3 | Recognise the signs of potential and actual problems |
| | | 3.4 | Take appropriate action |
| | | 3.5 | Trim plant to achieve required output rate and quality while maximising plant efficiency |

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| 4 | Change unit output rate, grade or specification | 4.1 | Predict the need to make a change to meet process requirements |
| | | 4.2 | Trim unit in preparation of changes |
| | | 4.3 | Make changes as required |
| | | 4.4 | Manage changes smoothly and in a timely manner |
| | | 4.5 | Minimise out of specification product/process disruptions as a result of the change |
| | | | |
| 5 | Maintain plant effectiveness | 5.1 | Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant |
| | | 5.2 | Identify critical equipment/processes and tune their performance |
| | | 5.3 | Identify issues likely to impact on plant performance and take appropriate action |
| | | 5.4 | Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people |
| | | 5.5 | Test trips and alarms as required |
| | | 5.6 | Complete minor maintenance according to procedures |
| | | | |
| 6 | Shut down unit | 6.1 | Determine type of shut down required |
| | | 6.2 | Give advance warning of shut down where possible |
| | | 6.3 | Change over individual items of equipment |
| | | 6.4 | Shut down individual items of equipment and the entire unit |
| | | 6.5 | Shut down to a standby condition if appropriate |
| | | 6.6 | Shut down in an emergency and otherwise when required |
| | | 6.7 | Reset trips and alarms after a shutdown |

- 7 Isolate and de-isolate plant
 - 7.1 Isolate plant
 - 7.2 Make safe for required work
 - 7.3 Check plant is ready to be returned to service
 - 7.4 Prepare plant for return to service

Required Skills and Knowledge

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

Required skills

For the plant system:

- efficient and effective operation of plant/equipment
- hazard analysis
- completing plant records
- communication
- problem solving

Also ability to:

- identify all items on a schematic of the production unit and describe the function of each
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- describe the basis of the process used in the production unit to transform the feed materials into the product, including the basic science of the process (where relevant)
- describe the causes and remedies of common problems, such as those selected in the Range Statement
- describe methods of changing rate/grade/specification or feed and the advantages and disadvantages of each

Ability to isolate the causes of problems to an item of equipment within the production unit and to be able to distinguish between causes of problems/alarm/fault indications, such as:

- process materials variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem,

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

Required knowledge

An understanding of the production unit/system and its integral equipment, to the level needed to control the system and recognise and resolve problems. In particular it includes:

- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit
- process parameters and limits (e.g. temperature, pressure, flow, pH and amps)
- duty of care obligations

- hierarchy of control
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling
- corrective action appropriate to the problem cause
- function and troubleshooting of major components and their problems
- types and causes of problems within operator's scope of skill level and responsibility

This knowledge is required of all major items of equipment which comprise the production unit/system.

Evidence Guide

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

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

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

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

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

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

Consistent performance should be demonstrated. In particular look

to see that:

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

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

Context of and specific resources for assessment

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

Method of assessment

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

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

- *MSAPMOHS200A Work safely.*

Guidance information for assessment

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

Range Statement

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

Codes of practice/

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

standards	used.
Context	This competency covers the operation of a unit of equipment and includes the operation of equipment ancillary to the main production unit. It includes all items of equipment and unit operations which form part of the operation of the unit.
Problems	Typical problems include: <ul style="list-style-type: none">• recognising and acting on unstable/sub-optimal operation• control of critical variables and outputs• variations in feed rates, quality, and so on
Start up shut down as required	Start up shut down as required includes: <ul style="list-style-type: none">• start up and shut down to/from normal operating conditions• start up and shut down to/from isolated, cold or empty• all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)
Appropriate action	Appropriate action includes: <ul style="list-style-type: none">• determining problems needing action• determining possible fault causes• rectifying problem using appropriate solution within area of responsibility• following through items initiated until final resolution has occurred• reporting problems outside area of responsibility to designated person
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: <ul style="list-style-type: none">• all work instructions• standard operating procedures• formulas/recipes• batch sheets• temporary instructions• any similar instructions provided for the smooth running of the plant <p>For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations.</p>
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance

Criteria and HSE requirements, the HSE requirements take precedence.

Product

Product includes anything produced by a process step and so includes intermediate products, such as the product from one process step which then becomes the feed for another'.

Unit Sector(s)

Operational/technical

Competency field

Not applicable

Co-requisite units

Not applicable