



Australian Government

PMAOPS300 Operate a production unit

Release: 1

PMAOPS300 Operate a production unit

Modification History

Release 1. Supersedes and is equivalent to PMAOPS300B Operate a production unit

Application

This unit of competency covers the skills and knowledge required to operate an enterprise-specific unit of a production plant, which is not otherwise described by other units in this Training Package. The production unit operation will integrate several plant items (single unit operations). For the operation of a single unit operation refer to the relevant PMAOPS2## unit of competency.

This unit of competency applies to operations technicians who are required to demonstrate a significant understanding of the process and the equipment operation in order to identify and rectify operational problems, predict the potential impact of the production unit output on the operation of the whole plant, and facilitate output changes.

Operation of the production unit includes the operation of other plant items which are integral to the operation of the production unit.

This unit of competency applies to an individual operating independently in a plant with local control, or in liaison with the control room operator in a plant with a centralised control panel, such as distributed control system (DCS) type controls. In the case of large complex plant, the operations technician would be part of a team during start-up and shutdown procedures.

The operations technician is expected to be capable of performing all parts of this unit of competency. At all times they would be liaising and cooperating with other members of the team.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Competency Field

Operations

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

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

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| 1 | Prepare for work | 1.1 Receive and give shift handover |
| | | 1.2 Identify work requirements |
| | | 1.3 Identify and control hazards |
| | | 1.4 Coordinate with appropriate personnel |
| | | 1.5 Check for recent work undertaken on the production unit |
| | | 1.6 Note any outstanding/incomplete work |
| | | 1.7 Check operational status of the production unit |
| | | |
| 2 | Operate production unit | 2.1 Describe the type of production unit, the component plant items and their duties |
| | | 2.2 Complete routine checks, logs and paperwork taking appropriate action on unexpected readings |
| | | 2.3 Change rate, grade or specification smoothly as required |
| | | 2.4 Adjust the production unit and its component plant items as appropriate to their type and duty to maximise performance |
| | | 2.5 Charge/discharge the production unit as required |
| | | |
| 3 | Diagnose and take appropriate action on abnormal situations | 3.1 Monitor the production unit and its component plant items frequently and critically throughout shift using measured/indicated data and senses as appropriate |
| | | 3.2 Describe impacts of any changes upstream and downstream |
| | | 3.3 Recognise actual and developing situations which may require action |
| | | 3.4 Apply operational knowledge to resolve problems |
| | | 3.5 Take other appropriate actions on abnormal situations which cannot be resolved during the shift to ensure safety and the resolution of the situation |
| | | 3.6 Follow through items initiated until final resolution has occurred |

4	Isolate and de-isolate production unit and its component plant items	4.1	Complete any required pre-start checks
		4.2	Start up/shut down production unit according to the production unit type and duty in liaison with other personnel
		4.3	Start up/shut down/changeover component plant items within the production unit according to their type and duty in liaison with other personnel
		4.4	Isolate entire production unit and/or any component plant item
		4.5	Make safe for required work
		4.6	Check production unit/plant item is ready to be returned to service
		4.7	De-isolate and prepare production unit/plant item for return to service

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Regulatory framework	The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used, and include one or more of the following: • legislative requirements, including work health and safety (WHS) • industry codes of practice and guidelines • environmental regulations and guidelines • Australian and other standards • licence and certification requirements
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All operations to which this unit applies are subject to stringent health, safety and environment (HSE) requirements, which may be imposed through state/territory 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.

Hazards

Hazards include one or more of the following:

- smoke, darkness and heat
- heat, smoke, dust or other atmospheric hazards
- electricity
- gas
- gases and liquids under pressure
- structural hazards
- structural collapse
- equipment failures
- industrial (machinery, equipment and product)
- equipment or product mass
- noise, rotational equipment or vibration
- plant services (steam, condensate and cooling water)
- limited head spaces or overhangs
- working at heights, in restricted or confined spaces, or in environments subjected to heat, noise, dusts or vapours
- fire and explosion
- flammability and explosivity
- hazardous products and materials
- unauthorised personnel
- sharp edges, protrusions or obstructions
- slippery surfaces, spills or leaks
- extreme weather
- other hazards that might arise

Non-routine problems

Non-routine problems must be resolved by applying operational knowledge to develop new solutions, either individually or in collaboration with relevant experts, to:

- determine problems needing action
- determine possible fault causes
- develop solutions to problems which do not have a known solution
- follow through items initiated until final resolution has occurred
- report problems outside area of responsibility to designated person

Non-routine problems are unexpected problems, or variations of previous problems and include one or more of the following:

- recognising and acting on unstable/sub-optimal operation
- control of critical variables and outputs
- variations in feed rates, quality, and so on
- unstable process variables, such as pressure, temperature, level and/or flow
- loss of utilities
- production unit trip, the trip of one or more component plant items
- emergency situations

Start up/shut down Start up/shut down includes the following:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold or empty
- start up and shut down to/from all other conditions experienced on the plant (i.e. from any condition to any condition experienced on the plant)

Procedures All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, include one or more of the following:

- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

Operate Operate is to monitor, adjust/make change to the production unit and/or its component items to meet specifications, by one or more of the following:

- manually in the plant
- using local controller in the plant

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

- 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 Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875>

Assessment Requirements for PMAOPS300 Operate a production unit

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria, and demonstrate the ability to:

- identify and control hazards
- use data and own senses to monitor plant and maximise performance
- isolate the causes of problems to an item of equipment within the production unit and to distinguish between causes of problems/alarm/fault indications, including:
 - process materials variations
 - instrument failure/wrong reading
 - electrical failure
 - mechanical failure
 - operational problem
- recognise early warning signs of equipment/processes needing attention or with potential problems
- take appropriate action to ensure a timely return to full performance
- perform pre-start checks, start-up/shutdown procedures and isolations and de-isolations
- complete written records
- communicate effectively with team or group, supervisors and other personnel
- identify and communicate information required by others.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- organisation procedures
- hazards that may arise in the job/work environment, and:
 - their possible causes
 - potential consequences
 - appropriate risk controls
- all items on a schematic of the production unit and the function of each
- the basis of the process used in the production unit to transform the feed materials into the product

- process-specific science (physics, chemistry and biochemistry) to the level of being able to interpret the science and extract factors controlling the process and product and by-product production rate and quality (e.g. for chemistry interpret the equation for factors controlling rate and yield and also interfering reactions, such as salts and hydrates)
- interactions between plant items/processes
- basic science of upstream and downstream processes
- product specifications and tolerances
- systems' operating parameters
- impact of external factors (e.g. variations in weather and feed)
- system integrity limits
- emergency shutdown procedures
- routine and non-routine problems that may arise, and the range of possible causes and processes to develop solutions
- methods of changing rate/grade/specification or feed and the advantages and disadvantages of each
- principles of operation of plant/equipment
- plant process idiosyncrasies
- correct methods of starting, stopping, operating and controlling
- isolation procedures
- process parameters and limits (e.g. temperature, pressure, flow, pH and amps)
- effects of variations in process conditions and materials
- required preparation and permits required for different types of work to be done on the production unit or its component items.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence based on a holistic assessment of the evidence.
- The collection of performance evidence:
 - should occur over a range of situations which include typical disruptions to normal, smooth operation of an operating plant
 - will typically include a supervisor/third-party report or other evidence, focusing on consistent performance and problem recognition and solving. A supervisor/third-party report must be prepared by someone who has a direct, relevant, current relationship with the person being assessed and who is in a position to form a judgement on workplace performance relevant to the unit of competency
 - must include the use of an appropriate industrial item of equipment requiring demonstration of operation, start-up and shutdown procedures and responding to problems
 - may use industry-based simulation for part only of the unit particularly where safety, lack of opportunity or significant cost is an issue.

- Assessment should occur in operational workplace situations. Where this is not possible, or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment reflecting realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Assessment in a simulated environment should use evidence collected from one or more of:
 - walk-throughs
 - pilot plant operation
 - demonstration of skills
 - industry based case studies/scenarios
 - 'what ifs'.
- Knowledge evidence may be collected concurrently with performance evidence (provided a record is kept) or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept).
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- In addition the assessor or anyone acting in subject matter expert role in assessment shall demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they shall assess with a subject matter expert who does meet these requirements.
- Technical competence can be demonstrated through one or more of:
 - relevant VET or other qualification/Statement of Attainment
 - appropriate workplace experience undertaking the type of work being assessed under routine and non-routine conditions
 - appropriate workplace experience supervising/ evaluating the type of work being assessed under routine and non-routine conditions.
- Currency can be demonstrated through one or more of:
 - being currently employed undertaking the type of work being assessed
 - being employed by the organisation undertaking the type of work being assessed and having maintained currency in accordance with that organisation's policies and procedures

- having consulted/had contact with an organisation undertaking the type of work being assessed within the last twelve months, the consultation/contact being related to assessment
- conducting on-the-job training/assessments of the type of work being assessed
- being an active member of a relevant professional body and participating in activities relevant to the assessment of this type of work.

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