



Australian Government

PMAOPS208B Operate chemical separation equipment

Release 2

PMAOPS208B Operate chemical separation equipment

Modification History

Release 2 – Minor clarifications and editorial corrections.

Unit Descriptor

This competency covers the operation of chemical separation equipment where the feed is usually single phase. It covers the range of separation equipment which rely on a phase change or chemical change to enact the separation and includes crystallisers, ion-exchange filters, absorbers and the like.

It also includes solving problems with separation processes and the equipment.

Application of the Unit

In this competency, an operator would typically start up and shut down separation operations in accordance with procedures, and make adjustments to flow rate and pressure, depending on the type of separation equipment.

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

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

PMAOPS246A Operate separation equipment

PMAOPS247A Operate powered separation equipment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	
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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 | Operate chemical separation equipment | 2.1 | Identify the type of chemical separation equipment |
| | | 2.2 | Start up and shut down chemical separation equipment according to type and duty |
| | | 2.3 | Monitor plant frequently and critically throughout shift using measured/indicated data and senses (e.g. sight and hearing), as appropriate |
| | | 2.4 | Adjust flow and pressure as appropriate to type of separation equipment |
| | | 2.5 | Complete routine checks, logs and paperwork, taking action on unexpected readings and trends |
| 3 | Isolate and de-isolate plant | 3.1 | Isolate plant |
| | | 3.2 | Make safe for required work |
| | | 3.3 | Check plant is ready to be returned to service |
| | | 3.4 | 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

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

Required knowledge

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

- all items on a schematic of the separator system and the function/s of each
- principles of operation of separation equipment
- factors affecting efficient operation of the separation equipment
- physics of operation, including behaviour of solids, liquids and gases, effects of phase changes, effects of temperature and pressure
- chemistry of operation, including simple chemical reactions, elements, compounds and mixtures
- function and troubleshooting of major internal components and their problems, such as reagents, contaminants, supports, nozzles and grids
- typical problems with separation equipment and their remedy
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- 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
- correct methods of starting, stopping, operating and controlling
- corrective action appropriate to the problem cause
- types and causes of problems within operator's scope of skill level and responsibility

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. For many plants, it might be appropriate for this unit to be assessed with:

- *PMAOPS201B Operate fluid flow equipment*
- *MSAPMSUP210A Process and record information.*

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/standards

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

Equipment

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

- crystallisers
- ion-exchange filters/columns

	• precipitators • absorbers/adsorbers
Remedial actions	Remedial actions could include: • making adjustments (e.g. flow and pressure) • carrying out minor maintenance within operator's skill level • identifying and reporting problems outside operator's scope of ability • identifying and controlling hazards related to chemical separation equipment and surrounding areas
Problems	Typical problems include: • seal/gasket leaks • pressure loss/low flow • cartridge/filter change • reagent/medium activity • blockages/build-up • contaminants
Start up shut down as required	Start up shut down as required includes: • 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: • 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: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant 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.

Health, safety and environment (HSE)

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between Performance Criteria and HSE requirements, the HSE requirements take precedence.

Unit Sector(s)

Operational/technical

Competency field

Not applicable

Co-requisite units

Not applicable