



Australian Government

PMAOPS232B Produce product by filtration

Release 2

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Modification History

Release 2 – Addition of metalliferous minerals to unit descriptor and minor editorial corrections.

Unit Descriptor

This competency covers the skills needed to operate typical standalone dual phase (solid/fluid) separation equipment as used in a chemical, oil/ hydrocarbons, metalliferous minerals processing or other plant.

Application of the Unit

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

The operations technician would:

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

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

This unit does not cover powered separation equipment (e.g. centrifuge) or chemical separation equipment which are instead covered by:

- *PMAOPS247A Operate powered separation equipment*
- *PMAOPS208B Operate chemical separation equipment.*

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/shut down the filter system | 2.1 | Select the appropriate filtration units or the appropriate number of units to ensure product specifications are met |
| | | 2.2 | Check the condition of all process equipment before start-up |
| | | 2.3 | Make filtration equipment or systems ready and bring components and entire system on line |
| | | 2.4 | Shut down individual components and whole system as required |
| 3 | Monitor the filtration process | 3.1 | Monitor process systems to ensure that product specifications are met |
| | | 3.2 | Monitor and keep filtration equipment within requirements |
| | | 3.3 | Liaise with appropriate people as required |
| | | 3.4 | Take appropriate action |
| | | 3.5 | Complete records as required |

- 4 Isolate and de-isolate plant
 - 4.1 Isolate plant
 - 4.2 Make safe for required work
 - 4.3 Check plant is ready to be returned to service
 - 4.4 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

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

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

Required knowledge

The knowledge referred to in the Evidence Guide for this unit includes:

- identify all items on a schematic of the filter system and describe the function of each
- principles of the filtration process
- filter cake properties where appropriate
- systems operating parameters
- principles of operation of separation equipment
- behaviour of solids, liquids and gases
- function and troubleshooting of major internal components and their problems, such as cartridges, baskets, supports, nozzles and grids
- typical problems with separation equipment and their remedy
- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit and the materials involved
- 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 filtration
- causes of head loss in filtration systems, including cakes and cake compressibility
- 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, role plays and 3-D virtual reality interactive systems.

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

Critical aspects 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. Consider co-assessment 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.

Context

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

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

Typical problems

Typical problems for your plant may include:

- control pressure
- effects on upstream and downstream plant
- clogging
- seal/gasket leaks
- pressure loss/low flow
- cartridge/filter change
- blockages/build-up/fouling
- erosion/wear

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