



Australian Government

PMAOPS301 Operate a distillation unit

Release: 1

PMAOPS301 Operate a distillation unit

Modification History

Release 1. Supersedes and is equivalent to PMAOPS301B Produce product by distillation

Application

This unit of competency covers the skills and knowledge required to monitor and control a distillation unit, which is separating two or more components, to achieve finished product that meets a predetermined specification.

The distillation column may be trayed or packed and may be performing cryogenic gas distillation, liquid distillation, azeotropic distillation, fractional distillation, vacuum distillation or molten metal distillation.

This unit of competency applies to operations technicians who are required to identify and correct operational problems, determine the impact of composition changes and adjust accordingly, and direct members of the operational team under start-up and running conditions.

In a typical scenario an operations technician would be monitoring and controlling the distillation section of a plant from a central control room. The process may involve one or more distillation columns and their associated equipment, piping and controls.

This unit of competency applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate

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

Operators undertaking this unit of competency should also be competent in operating fluid flow equipment and heat exchangers.

Competency in this unit requires the ability to integrate the operation of all the component parts as a whole.

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 distillation unit |
| | | 1.6 | Note any outstanding/incomplete work |
| | | 1.7 | Check operational status of distillation unit and its component units |
| 2 | Operate distillation unit | 2.1 | Describe the type of distillation 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 distillation unit and its component plant items as appropriate to their type and duty to maximise performance |
| 3 | Diagnose and take appropriate action on abnormal situations | 3.1 | Monitor distillation 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 |

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

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:

- 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)
- working at heights, in restricted or confined spaces, or in environments subjected to heat, noise, dusts or vapours
- 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, such as:
 - flooding
 - channelling (packed column)
 - dumping
 - entrainment
- control of critical variables and outputs
- variations in feed rates and/or quality

Operational knowledge includes one or more of the following:

- procedures
- training
- technical information, such as journals and engineering specifications
- remembered experience
- relevant knowledge obtained from appropriate people

Appropriate actions on abnormal situations

Appropriate actions on abnormal situations includes the following:

- 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

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.

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

Distillation unit This unit of competency includes all such items of equipment and unit operations which form part of the distillation system. A unit comprises two or more components of plant/equipment that are operated together to produce product, including as appropriate to the facility:

- columns/towers
- trays/packing
- boilers/reboilers
- condensers
- refrigerant compressors
- pumps
- valves

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>