



Australian Government

PMAOPS307 Transfer bulk fluids into/out of storage facility

Release: 1

PMAOPS307 Transfer bulk fluids into/out of storage facility

Modification History

Release 1. Supersedes and is equivalent to PMAOPS307B Transfer bulk fluids into/out of storage facility

Application

This unit of competency covers the skills and knowledge required to transfer bulk fluids into/out of storage facility. The storage facility may be a land-based tank farm or a tanker at sea. The storage facility will integrate several plant items (single unit operations). Operation of the storage facility includes the operation of ancillary equipment that is integral to the operation of the production unit, such as:

- pumps (e.g. transfer and circulation pumps, and stripping pumps)
- compressors (e.g. boil-off gas compressors)
- gauges
- deluge systems and other fire protection systems, such as flares, fire pumps, jockey pumps, fire monitors and sub-surface foam injection
- gas detection systems and equipment
- fire detection and reporting systems
- emergency shutdown systems
- tank dipping and measurement equipment
- instrumentation.

The unit of competency applies to storage facilities, such as:

- tanks, such as concrete bunded storage tanks, atmospheric pressure tanks, floating roof tanks, and temperature controlled tanks (heated, chilled and refrigerated)
- vessels (e.g. pressure storage vessels).

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, prepare for and undertake load-out/transfer, and ensure effective safety and communications systems are applied.

In a typical scenario involving land-based tank farms or tankers at sea transferring liquefied gas, the control room operator, from the main panel, will monitor and control the transfer of product into storage facilities, including controlling product levels, flows, temperatures and pressures. The operations technician will also prepare and complete all necessary documentation for the control, transfer and calculation of product volumes.

The storage facility or vessel will be monitored through the use of gas and fire detection (or other safety) equipment. Automatic sprinkler systems, deluges or other emergency response equipment will be activated in the event of fire/emergency detection and emergency shutdown systems will operate.

The equipment to be used in the transfer of product will be checked and tested before use. In some cases, before transferring, the circulation of product through pipelines will commence. This is usually for the purpose of pipeline chilldown and is required to minimise vapour pressure build-up in warm pipework.

A comprehensive fire water supply main may encompass the facility and/or be located on the vessel, and a suitable fire pump would be able to provide fire water requirements in emergencies.

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.

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.

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.

- | | | | |
|----------|-------------------------|-----|--|
| 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 storage/transfer |

		facilities
	1.6	Note any outstanding/incomplete work
	1.7	Check operational status of storage/transfer facilities
2	Prepare storage/transfer facilities	2.1 Manage products within the tank farm or at the platform in accordance with the site/enterprise's storage types, products and locations 2.2 Inspect storage and/or docking facilities for leaks or damage 2.3 Check and test safety systems to verify their operational condition and status, and report on all equipment faults 2.4 Conduct critical inspections of storage and tank farms (and ascertain seaworthiness of vessels at sea, if required) and transfer facilities ensuring areas are safe, clean and equipment can't be compromised by debris 2.5 Identify and report all equipment requiring maintenance, follow-up to satisfactory conclusion
3	Monitor storage facilities	3.1 Confirm tank mixes, capacities and quality, and determine if these are being maintained within the agreed product requirements prior to transfer 3.2 Monitor gas detection/environmental/safety systems to ensure the storage area is a safe environment and that the safety of the area or vessel is not compromised 3.3 Communicate storage conditions to transfer or other personnel to inform them of the operational condition and status of the storage facilities or vessel
4	Monitor load-out/transfer platform or facility in accordance with procedures	4.1 Monitor load-out/transfer systems on the platform or in the terminal load-out/transfer area 4.2 Monitor gas detection/environmental/safety systems to ensure the load-out/transfer area is a safe environment 4.3 Inform appropriate personnel of the load-out/transfer area status, and conditions of the storage facilities

- | | | | |
|---|--|-----|--|
| 5 | Conduct load-out/transfer in accordance with procedures | 5.1 | Communicate operational status to required personnel prior to loading |
| | | 5.2 | Ensure that all start-up permissives have been satisfied and product is ready for transfer |
| | | 5.3 | Set and adjust pump flow rates to keep within agreed capacities |
| | | 5.4 | Monitor loading pump performance to keep within stated operational ranges and vibration is in limits |
| | | 5.5 | Take and record product shipping/transfer samples if required |
| 6 | Isolate and de-isolate plant | 6.1 | Isolate storage/transfer facility or its component parts |
| | | 6.2 | Make safe for required work |
| | | 6.3 | Check storage/transfer facility/plant item is ready to be returned to service |
| | | 6.4 | De-isolate and prepare plant for return to service |
| 7 | Resolve problems | 7.1 | Identify possible problems in equipment and process |
| | | 7.2 | Determine problems needing action |
| | | 7.3 | Determine possible fault causes |
| | | 7.4 | Rectify problem using appropriate solution within area of responsibility |
| | | 7.5 | Follow up items until resolved |
| | | 7.6 | Report problems outside area of responsibility to designated person |

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

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:

- darkness, distance over which transfer must occur
- 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

Routine problems

Routine problems include one or more of the following:

- insufficient/inappropriate storage for product/material
- interruptions to loading through adverse weather conditions
- product surging
- control of temperature and pressure
- variations in feed
- vibration
- tank capacities and space

Non-routine problems

Non-routine problems are unexpected problems, or variations of previous problems and 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

Operational knowledge includes one or more of the following:

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

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 other conditions/situations experienced on the plant

Permissive	A permissive is any and all permissions which are required and include one or more of the following: • authorisation • permit/clearance • other permit sanctioned by procedures
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 both of the following: • manually in the plant • using local controller in the plant
Monitor	Monitor means to continuously or frequently observe using data and/or senses.
Product	Product includes one or more of the following: • hydrocarbons • oil • gas • bulk liquid chemicals/petrochemicals

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMAOPS307B Transfer bulk fluids into/out of storage facility

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 PMAOPS307 Transfer bulk fluids into/out of storage facility

Modification History

Release 1. Supersedes and is equivalent to PMAOPS307B Transfer bulk fluids into/out of storage facility

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 include the ability to:

- use data and own senses to monitor plant and maximise performance
- perform pre-start checks, inspections and tests, start-up/shutdown procedures, and isolations and de-isolations
- identify hazards and risks and apply risk control procedures
- identify early warning signs of equipment/processes needing attention or with potential problems and respond in accordance with procedures.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- all items on a schematic of the storage/transfer system and functions of each
- interactions between plant items/processes
- 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, causes of head loss in piping systems, including comparison of fittings using Le/d concept, fluid and pipe material properties, flow geometry and static electricity principles
- systems' operating parameters, integrity limits, product specifications and tolerances, tank and product mixes, flow rates and measures, tank capacities and percentages, process parameters and limits, including temperature, pressure, flow and pH
- function and troubleshooting of major components and their problems, such as impellers, seals or bearings
- hierarchy of control
- hazards that may arise in the job/work environment, and:
 - their possible causes
 - potential consequences
 - appropriate risk controls.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence based on a holistic assessment of the evidence.

- Where competency is also required and has not already been achieved in
 - PMAOPS201 Operate fluid flow equipment or
 - PMAOPS221 Operate and monitor prime movers and/or
 - PMAOPS222 Operate and monitor pumping systems and equipment and/or
 - PMAOPS223 Operate and monitor valve systems they may be co-delivered and co-assessed.
- The collection of performance evidence:
 - should occur over a range of situations which include typical disruptions to normal, smooth operations
 - will typically include a supervisor/third-party report 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 industrial scale storage and transfer facilities
 - 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 must demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they must 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.

Links

Companion Volume implementation guides are found in VETNet -

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