



Australian Government

PMAOPS307B Transfer bulk fluids into/out of storage facility

Release: 1

PMAOPS307B Transfer bulk fluids into/out of storage facility

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	In a typical scenario involving land based tank farms or tankers at sea, 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.
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Application of the Unit

Application of the unit	The storage facility or vessel will be monitored through the use of gas and fire detection equipment. Automatic sprinkler systems or deluges will be activated in the event of fire 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 chardown, 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.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	PMAOPS201B	Operate fluid flow equipment
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Employability Skills Information

Employability skills	This unit contains employability skills.
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work.	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel
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 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) 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 as required.	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.	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 as

ELEMENT	PERFORMANCE CRITERIA
	required.
6. Isolate and de-isolate plant.	6.1.Isolate plant 6.2.Make safe for required work 6.3.Check plant is ready to be returned to service 6.4.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.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This describes the essential skills and knowledge and their level, required for this unit.

Required skills

For the plant system/unit:

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

Required knowledge

Demonstration of competence in this unit must include knowledge of the following:

- principles of operation of plant/equipment
- physics and chemistry relevant to the process unit
- process parameters and limits, eg temperature, pressure, flow, pH
- duty of care obligations
- hierarchy of control
- communication protocols, eg radio, phone, computer, paper, permissions/authorities
- routine problems, faults and their resolution
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- correct methods of starting, stopping, operating and controlling flow
- causes of head loss in piping systems, including comparison of fittings using Le/d concept, fluid and pipe material properties, flow geometry etc
- corrective action appropriate to the problem cause
- function and troubleshooting of major internal components and their problems, such as impellers, seals or bearings
- types and causes of problems within operator's scope of skill level and responsibility.
- testing techniques
- equipment isolation and purging
- use and operation of safety equipment, including breathing apparatus
- tank and product mixes
- flow rates and measures
- tank capacities and percentages
- static electricity principles.

Sound knowledge of storage and transfer techniques required to transport oil, gas or water is

REQUIRED SKILLS AND KNOWLEDGE

expected.

Evidence Guide

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 or platform 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,

EVIDENCE GUIDE	
	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. In a major hazard facility, it may be appropriate to assess this unit concurrently with: • <i>MSAPMOHS200A Work safely.</i>
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

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 items of equipment and unit operations which form part of the load-out and storage system. For your facility this may include (select relevant items): - tanks, such as concrete bunded storage tanks, atmospheric pressure tanks, floating roof tanks, temperature controlled tanks (heated, chilled, refrigerated) - vessels, eg pressure storage vessels - pumps, eg transfer and circulation pumps, stripping pumps - compressors, eg boil-off gas compressors - gauges - fire protection and deluge systems, eg flare system - gas detection systems and equipment - tank dipping and measurement equipment. - instrumentation.
Safety equipment	Safety equipment on site may include: - main fire pumps - jockey pumps - fire monitors - deluge systems - sub-surface foam injection - gas detection and reporting systems - fire detection and reporting systems - emergency shutdown systems
Products	Products may include hydrocarbons, oil, gas or bulk liquid chemicals/petrochemicals.
Problems	Typical problems for your facility may include: - insufficient/inappropriate storage for product/material - interruptions to loading through adverse weather conditions

RANGE STATEMENT	
	• product surging • control of temperature and pressure • variations in feed • vibration • tank capacities and space.
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, empty • all other conditions experienced on the plant. ie 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 (eg Responsible Care) and government regulations.
Health, safety and environment (HSE)	All operations to which this unit applies are subject to stringent health, safety and environment 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)

Unit sector	Operational/technical
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		
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