Australian Government

# PMAOPS312B Undertake ship loading/unloading operations

**Revision Number: 1**

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

# PMAOPS312B Undertake ship loading/unloading operations

## Modification History

Not applicable.

## Unit Descriptor

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| **Unit descriptor** | In a typical scenario, the operations technician is responsible for the custody transfer of materials/products from the loading area to vessels or from vessels to storage areas. The operations technician will report the state of readiness of the loading facilities before starting transfer to the loading master and to the terminal operator. |

## Application of the Unit

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| **Application of the unit** | Loading areas can include:<br>• terminal facilities<br>• jetties<br>• production platforms<br>• FPSOs/FSOs.<br>The operations technician will control the cargo transfer rate within safe limits, which are agreed between the ship and/or the terminal prior to commencing transfer. Jetty and platform operators will observe the mooring and direct the positioning of ships in order to facilitate the safe connection and operation of loading arms and gantries. The operations technician will complete all necessary documentation for the control and calculation of product volumes.<br>Generally the operations technician would be part of a team during loading activities 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.<br>This unit applies to products such as LNG, LPG, oil and chemicals. |

## Licensing/Regulatory Information

Not applicable.

## Pre-Requisites

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| **Prerequisite units** | |

## Employability Skills Information

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| **Employability skills** | This unit contains employability skills. |

## Elements and Performance Criteria Pre-Content

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| 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

| ELEMENT | PERFORMANCE CRITERIA |
|---|---|
| 1. Prepare for work. | 1.1. Identify work requirements<br>1.2. Identify and control hazards<br>1.3. Coordinate with appropriate personnel |
| 2. Prepare for ship transfer | 2.1. Check that the vessel is ready for product transfer<br>2.2. Activate/bring on line all safety systems<br>2.3. Ensure all operational conditions for transfer of product are satisfied<br>2.4. Ensure safety check documentation is completed. |
| 3. Transfer product to/from ship. | 3.1. Check transfer advice/documentation and complete required records<br>3.2. Engage fire and deluge protection systems as required<br>3.3. Launch and retrieve batching pigs as required<br>3.4. Start pumps to commence the transfer process of the specified product<br>3.5. Control and monitor transfer rates and take appropriate action<br>3.6. Monitor the progress of the transfer and tank levels and take appropriate action<br>3.7. Identify vapour or product leakages/spills and take appropriate action<br>3.8. Apply emergency procedures as required. |
| 4. Complete transfer process. | 4.1. Achieve or satisfy capacities and transfer requirements within the allowable timeframes and schedules<br>4.2. Retrieve batching pigs as required<br>4.3. Decommission, isolate and disengage transfer pumps and arms/hoses from or to the vessel as required<br>4.4. Continue to monitor and control fire, deluge and safety systems during the finalisation of the loading process and let-go of the vessel as required<br>4.5. Complete all required logs and documentation and communicate the results of the transfer to the appropriate personnel<br>4.6. Shut down and bring transfer facilities off line, ensuring that the area has been made safe after the transfer has been completed. |
| 5. Isolate and de-isolate plant. | 5.1. Isolate plant<br>5.2. Make safe for required work<br>5.3. Check plant is ready to be returned to service<br>5.4. Prepare plant for return to service. |

# Required Skills and Knowledge

| REQUIRED SKILLS AND KNOWLEDGE |
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| 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 compressor system and distinguish between causes of problems/alarm/fault indications such as:<br>• instrument failure/wrong reading<br>• electrical failure<br>• mechanical failure<br>• operational problems<br>• metering problems<br>• spills/leaks<br>• meteorological events. |
| **Required knowledge** |
| The knowledge referred to in the Evidence Guide for this unit includes:<br>• all items on a schematic of the ship loading/unloading system and the function of each<br>• the nature/condition of materials being transferred to and from the vessel and the factors to be considered in the transfer operation<br>• effects of temperature and pressure in transfer operations<br>• storage and product transfer techniques and mediums.<br>• principles of operation of plant/equipment<br>• physics and chemistry relevant to the process unit and the materials/products being transferred<br>• process parameters and limits, eg temperature, pressure, flow, pH<br>• duty of care obligations<br>• hierarchy of control<br>• communication protocols, eg radio, phone, computer, paper, permissions/authorities<br>• routine problems, faults and their resolution<br>• relevant alarms and actions<br>• plant process idiosyncrasies<br>• correct methods of starting, stopping, operating and controlling flow<br>• corrective action appropriate to the problem cause<br>• function and troubleshooting of major internal components and their problems, such as impellors, seals or bearings<br>• types and causes of fluid flow problems within operator's scope of skill level and responsibility. |

# Evidence Guide

| EVIDENCE GUIDE | |
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| 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.<br><br>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 3D virtual reality interactive systems. In the case of evacuation training or of training for competencies practised in life threatening situations, simulation may be used for the bulk of the training.<br><br>This unit of competency requires an application of the knowledge contained in the use of ship loading and its 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.<br><br>Consistent performance should be demonstrated. In particular look to see that:<br><br>• early warning signs of equipment/processes needing attention or with potential problems are recognised<br>• the range of possible causes can be identified and |

| EVIDENCE GUIDE | |
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| | analysed and the most likely cause determined<br>• appropriate action is taken to ensure a timely return to full performance<br>• obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.<br><br>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 relevant fluid flow and tank farming units. |
| **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 | |
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| 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 italicized 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 if 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 ship loading/unloading system. For your plant this may include (select relevant items):<br>• loading pumps<br>• loading arms<br>• gantries<br>• fire extinguishers, hoses and jets<br>• gas and other hazard monitoring systems<br>• mooring lines<br>• compressors<br>• storage tanks<br>• pipelines and trunklines<br>• pig launcher, pig trap, batching pigs<br>• measurement systems. |
| **Typical problems** | Typical problems for your plant may include:<br>• surging<br>• control of temperature and pressure<br>• variations in feed<br>• product leakage. |
| **Ship transfer** | Ship transfer includes the transfer of product or materials to or from ships (ie loading or unloading of ships). |
| **Ready for transfer** | Ready for transfer includes:<br>• secured and properly moored<br>• transfer points aligned |
| **Safety systems** | Safety systems include systems required to protect the vessel and personnel during product transfer such as:<br>• deluge |

| RANGE STATEMENT | |
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| | • fire protection |
| **Operational conditions for transfer** | Operational conditions for transfer include:<br>connect and initiate loading pumps<br>arms/hoses |
| **Control of transfer rates** | Transfer rates may be controlled to ensure:<br>• the product is transferred safely<br>• transfer is within the defined storage capacities |
| **Appropriate action** | Appropriate action includes:<br>• determining problems needing action<br>• determining possible fault causes<br>• rectifying problem using appropriate solution within area of responsibility<br>• following through items initiated until final resolution has occurred<br>• reporting problems outside area of responsibility to designated person. |
| **Procedures** | Procedures may be written, verbal, computer-based or in some other form. They include:<br>• all work instructions<br>• standard operating procedures<br>• formulas/recipes<br>• batch sheets<br>• temporary instructions<br>• any similar instructions provided for the smooth running of the plant.<br>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)

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| **Unit sector** | Operational/technical |

# Competency field

| Competency field | |
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# Co-requisite units

| Co-requisite units | | |
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