



Australian Government

MARA001 Contribute to safe cargo operations on liquefied gas tankers

Release: 1

MARA001 Contribute to safe cargo operations on liquefied gas tankers

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to recognise hazards associated with liquefied gas tankers and to apply appropriate hazard control measures to ensure safe cargo operation.

This unit applies to seafarers required to assist in the safe operation of a liquefied gas tanker.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

A – Handling Cargo and Vessel Stability

Unit Sector

Not applicable.

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 Determine characteristics of tanker cargo and tankers to ensure safe transfer and transport of cargo	1.1	Features of various types of liquefied gas tankers are outlined
	1.2	Cargo operations of tankers are identified
	1.3	Properties of cargo being transported are identified and their impact on safety, the environment and vessel operations are outlined
	1.4	Hazards associated with the transport of cargo are clarified according to emergency response documentation
	1.5	Hazard controls associated with tanker cargo are employed according to organisational procedures

- | | | | |
|----------|--|-----|--|
| 2 | Comply with legislative and organisational requirements for safe transfer and transport of tanker cargo | 2.1 | Safety data sheets (SDS)/material safety data sheets (MSDS) relevant to cargo are accessed and procedures for tanker safety and safety management are identified |
| | | 2.2 | SDS/MSDS are interpreted to identify relevant cargo-related hazards to the vessel and to personnel |
| | | 2.3 | Legislative and organisational requirements are interpreted to identify appropriate actions for safe transfer and transport of cargo |
| 3 | Take precautions to prevent hazards | 3.1 | Organisational policies and procedures to minimise hazards are identified |
| | | 3.2 | Type and severity of the hazard posed by cargo is recognised |
| | | 3.3 | Transfer and transport of cargo is monitored to prevent hazards |
| | | 3.4 | Gas monitoring equipment is regularly inspected and used according to organisational procedures |
| 4 | Act on becoming aware of a hazardous situation | 4.1 | Source of hazard is identified according to organisational procedures |
| | | 4.2 | Risk is assessed considering severity and likelihood of consequences |
| | | 4.3 | Control measures to minimise risk are implemented to level of responsibility or referred to appropriate person for further action |
| | | 4.4 | Containment procedures are applied where appropriate |
| | | 4.5 | Appropriate safety procedures are followed and personal protective equipment is used according to organisational procedures |
| | | 4.6 | Risk is eliminated where possible, and if not practical, actions are taken to control risk |
| 5 | Take precautions to prevent pollution of the environment from release of liquefied gases | 5.1 | Procedures to prevent pollution are identified and observed at all times |
| | | 5.2 | Measures to prevent pollution during normal and emergency situations are applied according to regulatory requirements and organisational procedures |
| | | 5.3 | All relevant information is immediately reported to appropriate persons when a vapour leak or cloud is detected |

or a malfunction has occurred that poses a risk of a vapour leak or cloud

- 5.4 Shore-based response personnel are promptly notified when a vapour leak or cloud occurs

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

Specifies 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.

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Cargo operations must include:

- cargo handling equipment
- emergency shut-down system (ESS)
- loading, unloading and care in transit
- piping systems and valves
- tank cleaning, purging, gas-freeing and inerting

Properties must include:

- chemical symbols
- pressure and temperature including vapour pressure/temperature relationship
- types of electrostatic charge generation

Cargo must include:

- ammonia
- butadiene
- ethylene
- liquefied natural gas (LNG)
- liquefied petroleum gas (LPG)

- propylene
 - vinyl chloride
- Hazards must include:
- corrosion hazards
 - electrostatic hazards
 - environmental hazards
 - explosion and flammability hazards
 - extremely low temperatures
 - health hazards
 - pressure hazards
 - reactivity hazards
 - sources of ignition
 - toxicity hazards
 - vapour leaks and clouds
- Hazard controls must include:
- anti-static measures
 - atmospheric control
 - cargo inhibition
 - gas testing
 - importance of cargo compatibility
 - inerting, drying and monitoring techniques
 - segregation
 - ventilation
- Gas monitoring equipment must include:
- gas monitoring instruments
 - oxygen indicators
- Firefighting equipment must include:
- firefighting agents
 - fixed dry chemical systems
 - fixed foam systems
 - portable foam systems
- Measures must include:
- assisting in implementing shipboard spill containment procedures
 - reporting relevant information to the responsible person

Unit Mapping Information

This is a new unit. This unit is equivalent to MARA3001A Contribute to safe cargo operations on liquefied gas tankers.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

Assessment Requirements for MARAO01 Contribute to safe cargo operations on liquefied gas tankers

Modification History

Release 1. New unit of competency.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria on at least one occasion and include:

- communicating clearly and effectively
- correctly identifying safety data sheets (SDS)/material safety data sheets (MSDS), relevant cargo-related hazards to vessel and to personnel, and taking appropriate action according to organisational procedures
- ensuring cargo operations are carried out according to accepted principles and procedures to ensure safety of operations
- identifying and acting on becoming aware of a hazardous situation, according to organisational procedures
- interpreting and applying knowledge of liquefied gas tanker layouts, tanker cargo features, characteristics and hazards, and related hazard prevention strategies to duties on various types of liquefied gas tankers
- reading and interpreting SDS/MSDS
- recognising problems and hazards that can arise when managing safety on a liquefied gas tanker, taking appropriate remedial action and initiating appropriate solutions.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- anti-static measures in hazard control
- atmospheric control
- cargo handling equipment
- cargo inhibition in hazard control
- corrosion hazards associated with tanker operations
- emergency shut-down system (ESD)
- environmental hazards associated with tanker operations
- explosion and flammability hazards associated with tanker operations
- extremely low temperatures associated with tanker operations
- gas testing
- general arrangement and construction of liquefied gas tankers
- health hazards associated with tanker operations

- importance of cargo compatibility
- inerting, drying and monitoring techniques in hazard control
- information on a SDS/MSDS
- loading, unloading and care in transit
- piping systems and valves
- pressure and temperature, including vapour pressure/temperature relationship
- pressure hazards associated with tanker operations
- properties and characteristics of liquefied gas
- reactivity hazards associated with tanker operations
- relevant chemical symbols
- relevant firefighting operations and the use of firefighting installations
- segregation in hazard control
- sources of ignition associated with tanker operations
- tanker cleaning, purging, gas-freeing and inerting
- tanker safety culture and safety management
- types of electrostatic charge generation
- types of liquefied gas tankers
- vapour leaks and clouds associated with tanker operations
- ventilation in hazard control
- work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices.

Assessment Conditions

Assessors must satisfy National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) assessor requirements.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

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.

Resources for assessment must include access to:

- tools, equipment, machinery, materials and personal protective equipment currently used in industry
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- range of relevant exercises, case studies and/or simulations.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

