



Australian Government

MARA020 Manage advanced oil tanker cargo operations

Release: 1

MARAO20 Manage advanced oil tanker cargo operations

Modification History

Release 1. This is the first release of this unit of competency in the MAR Maritime Training Package.

Application

This unit involves the skills and knowledge required to manage advanced oil tanker cargo operations.

This unit applies to people working in the maritime industry in the capacity of:

- Chief Mate
- Deck Officers
- Engineering Officers
- Engineers
- Masters
- Ratings.

Licensing/Regulatory Information

This unit is equivalent to and delivers the objectives of the following STCW provisions:

- STCW Reg V/1-1 (3 and 4) and Code Section A-V/1-1 (2), Table A-V/1-1-2.

Legislative and regulatory requirements are applicable to this unit.

- This unit is one of the requirements to obtain Australian Maritime Safety Authority (AMSA) certification as Chief Mate, Deck Officers, Engineering Officers, Engineers, Masters or Ratings for advanced operations on oil tankers and to meet regulatory requirements this unit must be delivered consistent with Marine Orders and with the relevant sections of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).
- Those regulatory requirements include STCW International Maritime Organization (IMO) model course competencies and areas of knowledge, understanding and proficiency, together with the estimated total hours required for lectures and practical exercises. Teaching staff should note that timings are suggestions only and should be adapted to suit individual groups of trainees depending on their experience, ability, equipment and staff available for training.

Pre-requisite Unit

Not applicable

Competency Field

A - Handling Cargo and Vessel Stability

Unit Sector

Not applicable

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Perform work safely and monitor all cargo operations

PERFORMANCE CRITERIA

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

- 1.1** Communication with personnel is clear, concise and accurate and information is understood and acted upon
- 1.2** Cargo operations are planned, risk is managed and carried out in accordance with accepted principles and procedures to ensure safety of operations and avoid pollution of the marine environment
- 1.3** Potential non-compliance with cargo operation-related procedures are identified and rectified promptly
- 1.4** Cargo operations are carried out in a safe manner, taking into account oil tanker designs, systems and equipment
- 1.5** Proper loading, stowage and unloading of cargo is undertaken to ensure that stability and stress conditions remain within safe limits at all times
- 1.6** Actions taken and procedures are followed and correctly applied, and the appropriate shipboard cargo related equipment used
- 1.7** Calibration and use of monitoring and gas detection equipment are in compliance with operational practices and procedures
- 1.8** Procedures for monitoring and safety systems ensure that all alarms are detected promptly and acted upon in accordance with workplace emergency procedures
- 1.9** Personnel are allocated duties and informed of procedures and standards of work to be followed in a

		manner appropriate to the individuals concerned and in accordance with safe operational practices
2	Recognise physical and chemical properties of oil cargoes	2.1 Information resources are used effectively to identify properties and characteristics of oil cargo and their impact on safety and environmental protection
		2.2 Information resources are used effectively to identify properties and characteristics of related gases and their impact on safety and vessel operation
3	Take precautions to prevent hazards	3.1 Cargo-related hazards to the vessel are identified, risk assessed, and control measures are implemented
		3.2 Cargo-related hazards to personnel are correctly identified and proper control measures are taken
4	Apply work health and safety (WHS)/occupational health and safety (OHS) precautions	4.1 Procedures designed to safeguard personnel and the ship are observed at all times
		4.2 Safe working practices are observed, and appropriate safety and protective equipment is correctly used
		4.3 Working practices are conducted in accordance with legislative requirements, codes of practice, permits to work and environmental concerns
		4.4 Breathing apparatus is used correctly by personnel
		4.5 Entry into enclosed spaces is undertaken in accordance with workplace procedures
5	Respond to emergencies	5.1 Type and impact of the emergency is promptly identified, and the response actions conform with workplace emergency procedures and contingency plans
		5.2 Order of priority, the levels and timescales of making reports and informing personnel are undertaken relevant to the nature of the emergency and accurately reflect the urgency of the problem
		5.3 Evacuation, emergency shutdown (ESD) and isolation procedures are undertaken appropriate to the nature of the emergency and are implemented promptly
		5.4 Medical emergency procedures are identified and required actions taken conform to current recognised

		first aid practices and international guidelines
6	Take precautions to prevent pollution of the environment	6.1 Operations are conducted in accordance with accepted principles and workplace procedures to prevent pollution of the atmosphere 6.2 Operations are conducted in accordance with accepted principles and workplace procedures to prevent pollution of the environment
7	Monitor and control compliance with legislative requirements	7.1 Cargo handling is conducted in compliance with relevant IMO instruments 7.2 Cargo handling is conducted in compliance with industrial standards and codes of safe working practices 7.3 Workplace documentation is completed in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

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

Unit Mapping Information

This is a new unit. No equivalent unit.

Links

Companion Volume implementation guide can be found in VetNet -

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

Assessment Requirements for MARAO20 Manage advanced oil tanker cargo operations

Modification History

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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:

- applying pump theory, characteristics and types of cargo pumps and their safe operation
- applying relevant international regulations, codes, industry guidelines, industry standards and port regulations relevant to the safe loading, unloading, care and handling of cargo
- applying safe work practices and risk assessments for personal and shipboard safety
- applying safe work practices following a collision, grounding and spillage
- applying safety management system (SMS) and requirements
- calibrating and using monitoring and gas-detection systems, instruments and equipment
- communicating effectively with personnel and reporting authorities
- conducting cargo operations with acceptable safety limits, including stress limits at all times
- developing and applying cargo-related operation plans, procedures and checklists
- evaluating tanker design, systems, equipment and cargo to inform decision making during cargo operations
- evaluating the effect of cargo on trim, stability and structural integrity, including use of trim and stability manuals during cargo operations
- managing and supervising personnel with cargo-related responsibilities
- monitoring enclosed space rescue, medical emergency, fire, system failure or failure of services essential to cargo, collision, grounding and spillage emergencies
- performing cargo measurements and calculations relevant to cargo operations
- using loading and unloading plans
- using personal protective equipment (PPE) and devices
- using safety data sheet (SDS)/materials safety data sheets (MSDS) during cargo operations and first aid incidents.

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:

- alarms and trips, including:

- high-level alarms
- low-level alarms
- tank pressure monitoring and alarm systems
- automatic detection systems
- calibration and use of monitoring and gas-detection systems, instruments and equipment
- cargo measurements and calculations
- cargo-related operations, including:
 - ballasting and deballasting
 - crude oil washing
 - gas-freeing
 - inerting
 - load on top
 - loading and unloading plans
 - ship-to-ship transfers
 - tank cleaning
- consequences, including dangers, of non-compliance with relevant legislation and regulations
- cargo operation plans, procedures and checklists
- effect of bulk liquid cargo on trim, stability and structural integrity
- emergency procedures, including actions to be taken in event of:
 - cargo operations emergency shutdown (ESD)
 - collision
 - enclosed space rescue
 - failure of services essential to cargo
 - firefighting
 - grounding
 - ship emergency response plan
 - spillage
 - system failure
- firefighting systems, including:
 - fire protection and extinguishing systems
 - fire-extinguishing agents, advantages and disadvantages
- gas freeing and inerting systems, including flue gas and independent generators
- hazards and control measures, including:
 - electrostatic hazards
 - explosion
 - flammability
 - health hazards
 - inert gas composition
 - oxygen deficiency

- toxicity
- information contained in SDS/MSDS
- international regulations, codes, industry guidelines, industry standards and port regulations, including:
 - codes of safe working practices
 - environmental procedures
 - industrial standards
 - industry guidelines
 - International Convention for the Prevention of Pollution from Ships (MARPOL)
 - International Convention for the Safety of Life at Sea (SOLAS)
 - International Medical Guide for Ships
 - International Safety Guide for Tankers and Terminals (ISGOTT)
 - International Safety Management (ISM) Code for oil tankers
 - SDS/MSDS
 - Medical First Aid Guide (MFAG)
 - medical first aid procedures
 - trim and stability manual
 - workplace procedures
- monitoring and safety systems, including ESD
- oil tanker design, systems and equipment, including:
 - cargo area venting and accommodation ventilation
 - cargo heating systems
 - cargo-related electrical and electronic control system
 - environmental protection equipment, including oil discharge monitoring equipment (ODME)
 - firefighting systems
 - gauging systems and alarms
 - general arrangement and construction
 - pumping arrangement and equipment
 - slop arrangements
 - tank arrangement, pipeline system and tank venting arrangement
 - tank cleaning, gas freeing and inerting systems
 - tank coating
 - vapour recovery systems
- physical and chemical properties of oil cargo
- pollution prevention, including:
 - controlled operational pollution at sea
 - procedures
 - requirements of ships construction and equipment
- pressure control systems, pressure surge and typical settings

- pump theory and characteristics, including types of pumps and their safe operation
- rationale, practical application and implications of ship design, systems and equipment, including:
 - impact on decision making in typical and emergency situations
 - location, positioning and segregation
 - operational advantages, disadvantages and limitations, and risk assessments
- risk assessment methodology and risk analysis for oil tankers
- safe operation of systems and equipment, including tanker safety culture and implementation of safety-management system
- safe working practices, risk assessment, personal shipboard safety procedures and precautions, including:
 - before and during repairs and maintenance work
 - electrical safety
 - entering enclosed spaces including correct use of different types of breathing apparatus
 - hot and cold work
- selection and correct use of PPE, including personal monitors
- tanker safety culture and implementation of SMS
- types, selection and correct use of different types of breathing apparatus
- work health and safety (WHS)/occupational health and safety (OHS) legislation and policies.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

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.

Practical assessment must occur in a workplace or realistic simulated workplace, under the normal range of workplace conditions.

Simulations and scenarios may be used where situations cannot be provided in the workplace or may occur only rarely, in particular for situations relating to emergency procedures and adverse weather conditions where assessment would be unsafe, impractical or may lead to environmental damage.

Resources for assessment must include access to:

- applicable documentation, such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- tools, equipment, machinery, materials and relevant personal protective equipment (PPE)

currently used in industry.

Links

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