



Australian Government

MARN014 Plan and manage safe loading, unloading, securing and stowage of cargo

Release: 1

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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 plan and ensure safe loading, stowage, securing and care during the voyage and unloading of cargo, including dangerous goods.

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

- Master of a commercial vessel Unlimited.

Licensing/Regulatory Information

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 a Master Unlimited 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

N – Seamanship

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.

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

1 Develop cargo plan

- 1.1** Cargo properties and characteristics are identified and their impact on safety, the environment and vessel operations are outlined
- 1.2** Communication is conducted with terminal personnel to establish loading and unloading arrangements
- 1.3** Information and equipment are used in planning to ensure hull stress is kept within acceptable limits
- 1.4** Cargo plan is prepared according to legislative and organisational requirements

2 Oversee cargo operations

- 2.1** Preparations for loading are monitored according to the cargo plan and organisational procedures
- 2.2** Regulations, procedures and instructions are interpreted to ensure that cargo is correctly identified, inspected and confirmed against documentation
- 2.3** Communication is maintained with crew and terminal personnel involved in cargo loading/unloading to facilitate loading/unloading
- 2.4** Cargo operations are managed to ensure they comply with regulations, procedures and instructions
- 2.5** Vessel stability is monitored during loading/unloading operations
- 2.6** Ballast management procedures are carried out according to organisational procedures and port authority requirements
- 2.7** Action is taken in a cargo handling incident or emergency to secure the cargo and the vessel and to maintain the safety of persons involved
- 2.8** All cargo handling documentation is completed according to organisational procedures and regulatory requirements

3 Comply with legislation

- 3.1** Regulations, procedures and instructions are interpreted

- for dangerous cargo** to ensure that dangerous cargo is correctly identified, inspected and confirmed against documentation, prior to cargo operations
- 3.2** Information regarding dangerous cargo is made readily available in an incident
- 3.3** Cargo operations are managed to ensure they comply with regulations, operational and security procedures, and cargo plan
- 3.4** Safety data sheets (SDS)/material safety data sheets (MSDS) are accessed and interpreted to identify relevant cargo-related hazards to vessel and to personnel
- 3.5** Procedures for safety and safety management are identified and documented
- 3.6** Hazards associated with dangerous cargo are identified and action is taken to minimise risk to personnel, cargo, vessel and the environment
- 3.7** Action is taken in a dangerous cargo handling incident or emergency to secure cargo and vessel, and to maintain the safety of persons involved
- 3.8** All documentation is completed according to organisational procedures and regulatory requirements
- 4 Manage the care of cargo during the voyage**
- 4.1** Plan for the care of cargo during the voyage is prepared according to organisational and customer requirements and relevant regulations
- 4.2** Cargo care operations are managed to ensure they comply with regulations, procedures and instructions
- 4.3** Cargo stowage and security is managed to ensure stability and stress conditions remain within safe limits at all times during the voyage
- 4.4** Extent and frequency of cargo condition monitoring is determined appropriate to its nature and prevailing conditions
- 4.5** Hazards associated with cargo stowage are identified and action is taken to minimise risk to personnel, cargo, vessel and the environment
- 4.6** Unacceptable or unforeseen variations in the condition or specification of the cargo is promptly recognised and

- remedial action is taken immediately to safeguard the safety of the vessel and those onboard
- 4.7** Documentation is completed according to organisational procedures and regulatory requirements
- 5 Manage emergencies related to cargo**
- 5.1** On becoming aware of emergency, initial actions are taken according to contingency plans, urgency of the situation and nature of the emergency
- 5.2** Onboard personnel are given information and instructions clearly and accurately
- 5.3** Procedures are implemented to combat emergency and protect persons onboard
- 5.4** Communications are established with others to facilitate the emergency response process
- 5.5** Injured persons are provided with assistance
- 5.6** Contact is maintained with others at all times to keep them briefed on the emergency response process
- 5.7** Preparation for abandoning vessel is undertaken, as required
- 5.8** Cessation of emergency is communicated to appropriate personnel
- 6 Prevent pollution of the environment**
- 6.1** Procedures to prevent pollution are identified and observed at all times
- 6.2** Measures to prevent pollution during normal and emergency situations are applied according to regulatory requirements and organisational procedures
- 6.3** 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
- 6.4** Shore-based response personnel are promptly notified when a vapour leak or cloud occurs
- 7 Complete documentation related to cargo**
- 7.1** Correct logbook entries are made relating to cargo operations and incidents according to regulatory requirements and organisational procedures
- 7.2** Letter of protest is completed in an incident relating to

cargo operations and care

- 7.3 Cargo reports and documentation are completed and maintained according to regulatory requirements and organisational procedures
- 7.4 Independent cargo surveyor reports are received and acknowledged as required
- 7.5 Cargo samples are correctly documented and secured as required

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 unit replaces and is equivalent to MARN006 Manage cargo operations.

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 MARN014 Plan and manage safe loading, unloading, securing and stowage of cargo

Modification History

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

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 international regulations, codes and standards concerning the safe handling, stowage, securing and transport of cargo
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices
- communicating clearly and effectively, establishing effective communications and improving working relationships
- conducting and recording tests and inspections of cargo handling equipment according to regulations and organisational procedures
- conducting loading and unloading operations of cargo and heavy cargo to ensure safe stowage of cargo, vessel stability, trim and stress limitations are not exceeded at any time
- correctly identifying safety data sheets (SDS)/material safety data sheets (MSDS), relevant cargo-related hazards to vessel and personnel, and taking appropriate action according to organisational procedures
- developing effective planning documents and providing high-quality reports that conform international regulations
- ensuring currency of relevant regulatory and legislative knowledge
- establishing procedures for safe cargo handling according to provisions of the relevant instruments, such as:
 - International Maritime Dangerous Goods (IMDG) Code,
 - International Maritime Solid Bulk Cargoes (IMSBC) Code
 - International Convention for the Prevention of Pollution from Ships (MARPOL) 73/78 Annexes III and V
 - International Safety Guide for Oil Tankers and Terminals (ISGOTT)
 - other relevant information
- interpreting and applying knowledge of bulk carriers, containers and container ships, chemical and oil tanker, and liquefied gas tanker layouts, platform supply vessels, roll-on and roll-off (ro-ro) carriers, cargo features, and characteristics applying available shipboard data related to loading, care and unloading of cargo
- reading and interpreting cargo handling documentation
- recognising problems and hazards that can arise when managing safety on chemical and

oil tankers, and liquefied gas tankers, taking appropriate remedial action and initiating appropriate solutions

- using draft survey methods to determine cargo quantities and vessel displacement
- using stability and trim diagrams, and stress-calculating equipment to keep hull stress and stability within acceptable limits at all times.

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:

- application of ventilation requirements for various cargo
- bulk carrier, chemical and oil tanker layouts, and liquefied gas tanker layouts, cargo features and characteristics, common structural rules and design limitations
- cargo care operations, including:
 - checking cargo lashings
 - maintaining ventilation requirements
 - monitoring cargo temperatures liable to spontaneous combustion
 - monitoring refrigerated cargo temperatures
- cargo handling documentation, including:
 - bills of lading
 - cargo gear register
 - cargo plan
 - letter of protest
 - logbook
 - ship/shore safety and security checklists
- cargo handling incidents or emergencies, including:
 - cargo shift
 - damaged cargo
 - damaged dangerous goods and escaping cargo or fumes
 - failure of cargo handling equipment, including lashings
 - failure of refrigeration machinery
 - fire in cargo spaces
 - incorrect ventilation
 - incorrectly stowed cargo
 - spontaneous combustion
- cargo plan, including:
 - allocating cargo containers requiring refrigeration appropriate spaces
 - avoiding incompatible cargo stowage
 - calculations relating to stability and stress
 - ensuring cargo is evenly distributed to maintain acceptable trim at all phases of the

voyage

- ensuring the loading/unloading sequence is in accordance with agreed cargo plan
- loading cargo manifest
- observing regulations relating to hazardous material/dangerous goods handling and stowage
- cargo stowage plan
- chemical tankers, including tank cleaning and control of pollution in chemical tankers
- compliance with the minimum freeboard requirements of the load line regulations
- confined space entry procedures
- dangerous goods classification, signage, stowage and segregation requirements under the IMDG Code and relevant Marine Orders
- effect on trim and stability of cargo and cargo operations
- gas tankers, including cargo operations in gas tankers
- hazards and control measures and additional safety measures associated with:
 - bulk carriers
 - chemical and oil tanker
 - liquefied gas tanker cargo operations
- information and equipment, including:
 - automatic databased (ADB) equipment
 - ballasting and deballasting procedures, including ballast water management convention
 - bulk cargo codes
 - calculations relating to drafts, deadweight, stability, trim and stress
 - cargo and lashing codes
 - IMSBC Code, MARPOL 73/78 Annexes III and V and other relevant information, including Australian Maritime Safety Authority (AMSA) and Notices relating to cargo carriage, loading and unloading
 - IMDG Code
 - international regulations, codes and standards concerning the safe handling, stowage, securing and transport of cargo
 - relevant sections of maritime regulations, codes and conventions related to chemical and oil tankers, and liquefied gas tankers
 - requirements for loading and care of various cargo types
 - requirements for the carriage of grain, grain stability and timber cargo
 - shipboard data, including drawings, load limitations and safe working loads
 - stability and trim diagrams
 - stress-calculating equipment
- loading and unloading operations with special regard to the transport of cargo identified in the Code of Safe Practice for Cargo Stowage and Securing
- loading cargo and ballasting to keep hull stress within acceptable limits
- maintenance required for cargo handling equipment and hatch covers

- methods and safeguards when fumigating hold
- oil tanker operations and related pollution prevention regulations
- preparation requirements for loading, including:
 - checking hatch covers for damage and ensuring watertight integrity of hatches
 - checking holds to ensure they are clean, dry and free of odour
 - checking bilges and bilge systems are operational before sealing cargo stowages
 - covering bilges with tarpaulins/wrappers before loading, as required
 - ensuring survey certification for all cargo handling equipment is valid and cargo record book is available for inspection
 - following confined space entry procedures, as required
 - inspecting access arrangements in holds to ensure they are in a safe condition
 - reviewing supplies of dunnage, mats and cargo-securing equipment to ensure sufficient are available
- procedures for receiving and delivering cargo
- relevant firefighting operations and the use of firefighting equipment
- shear forces, bending moments and torsional moments
- stability, trim and stress records
- stowage and securing of cargo onboard vessels, cargo-handling gear, and securing and lashing equipment, including timber deck cargo
- WHS/OHS requirements and work practices.

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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