Australian Government

MARA4001A Manage loading, discharging and stowage of cargo

Release 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

MARA4001A Manage loading, discharging and stowage of cargo

Modification History

Release 1
This is the first release of this unit.
This unit replaces and is equivalent to TDMMA907B Prepare a cargo plan for cargo loading and unloading operations within limits of responsibility of a Master 4.

Unit Descriptor

This unit involves the skills and knowledge required to manage the loading, discharging and stowage of cargo to prevent damage or deterioration and to deliver it, as far as is possible, in as good a condition and order as it was when received aboard.

Application of the Unit

This unit applies to people working in the maritime industry in the capacity of Master on a range of vessels up to 80 metres.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

1 Plan the stow	1.1	Loading manual is interpreted to determine operational loading conditions
	1.2	Still water shear forces and bending moments in any load or ballast condition are known and not exceeded
	1.3	Load is planned to ensure stresses in vessel are minimised by evenly distributing ***cargo***
	1.4	Load is planned to avoid incompatible cargo stowage
	1.5	Regulations relating to ***hazardous materials/dangerous goods*** are observed, where appropriate
	1.6	Load is planned for unloading sequence
	1.7	Vessel cargo carrying capacity is not exceeded for appropriate load line
	1.8	Vessel trim is calculated to allow for optimum vessel performance at sea
2 Plan load/unload with stevedores	2.1	Available port/vessel ***cargo handling gear and equipment*** is determined
	2.2	Handling capacity of cargo handling gear and equipment is established
	2.3	Pumping capacity of cargo pumps is verified
	2.4	Availability and status of human resources is resolved
	2.5	Cargo manifest is made available
	2.6	***Cargo stowage plan*** is completed and agreed with stevedores
	2.7	Stability calculation is made and checked against vessel stability information manual
	2.8	Notice of readiness to load/unload is provided
3 Prepare for loading	3.1	Holds are checked to ensure they are clean, dry and free of smell
	3.2	Safety arrangements in holds are verified to ensure they are operational
	3.3	Supplies of dunnage and mats are reviewed to ensure there are sufficient available

	3.4	Bilges are covered with tarpaulins/wrappers before loading
	3.5	Checks are made to ensure cargo is correctly identified, inspected and confirmed against documentation
	3.6	Preparations for loading are monitored according to stowage plan and organisational procedures
4 Control loading/ unloading of cargo	4.1	Instructions are given to crew and stevedores involved in cargo loading/unloading according to cargo stowage plan
	4.2	Compliance with regulations, procedures and instructions pertaining to type of cargo being handled is managed during loading/unloading operations
	4.3	Loading/unloading is monitored to ensure loading rate is not exceeded in the case of bulk or liquid cargo
	4.4	Vessel stability is observed during loading/unloading operations
	4.5	Loading/unloading operations are checked against stowage plan
	4.6	Cargo is secured and lashed according to lashing plan
	4.7	All cargo handling documentation is completed according to organisational procedures and regulatory requirements
5 Manage ballast management operations	5.1	Ballast discharge requirements of port authority are complied with
	5.2	Ballast management activities are monitored according to organisational procedures and port authority requirements
	5.3	***Ballast management problems*** are identified and appropriate action is taken to minimise risk to the environment
6 Monitor care of cargo during voyage	6.1	Vessel plan for care of cargo during the voyage is implemented according to organisational and customer requirements, and relevant regulations
	6.2	Ventilation and humidity control systems are checked
	6.3	Action required to maintain the wellbeing of cargo during the voyage is initiated according to customer requirements and organisational procedures
	6.4	Compliance with safety and hazard minimisation procedures and regulations related to cargo care is managed at all times during the voyage to maintain safety of personnel, cargo and vessel
	6.5	Appropriate action is taken in the event of ***a cargo-related incident or***

emergency to rectify problem, secure cargo and maintain safety of vessel and personnel

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required Skills:

- Identify and solve problems related to loading, stowage, security and unloading of cargo
- Interpret stability manual and ensure stability calculations are within appropriate parameters for proposed cargo operation
- Monitor use of equipment involved in loading, stowage, security and unloading of cargo
- Read, interpret and apply instructions, regulations, procedures and information relevant to loading, stowage, security and unloading of cargo

Required Knowledge:

- Ballast management issues and procedures
- Cargo handling documentation requirements
- Container position numbering
- Design of vessel hold
- Effects on cargo handling of sea conditions, wind and weather
- Effects of different types of cargo operations on vessel trim and stability
- Effects upon stability during loading and discharging operations including heeling moments from gear and loads
- Homogenous loading
- Main stresses set up by cargo, hogging, sagging and shearing
- Methods of;
  - handling various types of cargo
  - caring for various types of cargo
- Operational characteristics of different types of shipboard and terminal-based cargo handling equipment and facilities
- Principles of cargo care
- Procedures for carrying out calculations involving weights, capacities, stowage factors, load densities
- Relevant sections of applicable maritime regulations
- Relevant work health and safety (WHS)/occupational health and safety (OHS) and cargo handling legislation, codes of practice, policies and procedures
- Standard stowage position numbering systems used on container vessels
- Static and dynamic loads
- Types of lashing devices
- Typical cargo handling problems and hazards, and appropriate preventative and remedial actions and solutions
- Typical types and sizes of shipping containers

- Usual methods of packing, loading and discharging, stowage, dunnaging etc.
- Use of cargo handling gear including purchases and tackles
- Various types of cargo likely to be carried; their peculiar characteristics, liability to damage, decay or deterioration; their measurements; their hazards and problems, and appropriate preventative and remedial action and solutions
- Ways of restricting vessel stress levels within permitted levels within permitted limits during loading/discharging cargo

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, the required skills and knowledge, the range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the Elements, Performance Criteria, Required Skills, Required Knowledge and include:

- developing effective planning documents
- producing reliable documentation.

Context of and specific resources for assessment

Performance is demonstrated consistently over time and in a suitable range of contexts.

Resources for assessment include access to:

- industry-approved marine operations site where managing the loading, discharging and stowing of cargo on a vessel up to 80 metres may be conducted
- tools, equipment and personal protective equipment currently used in industry
- relevant regulatory and equipment documentation that impacts on work activities
- range of relevant exercises, case studies and/or other simulated practical and knowledge assessments
- appropriate range of relevant operational situations in the workplace.

In both real and simulated environments, access is required to:

- relevant and appropriate materials and equipment
- applicable documentation including workplace procedures, regulations, codes of practice and operation manuals.

Method of assessment

Practical assessment must occur in an:

- appropriately simulated workplace environment and/or
- appropriate range of situations in the workplace.

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate to this unit:

- direct observation of the candidate managing the loading, discharging and stowing of cargo on a vessel up to 80 metres
- direct observation of the candidate applying relevant WHS/OHS requirements and work practices.

Guidance information for

Holistic assessment with other units relevant to the industry

assessment	sector, workplace and job role is recommended. In all cases where practical assessment is used it should be combined with targeted questioning to assess Required Knowledge. Assessment processes and techniques must be appropriate to the language and literacy requirements of the work being performed and the capacity of the candidate.

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.

Cargo may include:	• Bulk cargo • Containerised cargo • Deck cargo • Liquid cargo • Refrigerated cargo • Any other material, equipment or machinery that may be safely handled and stowed on the vessel
Hazardous materials/dangerous goods may include:	• Any cargo described in the International Maritime Dangerous Goods (IMDG) Code as hazardous or dangerous
Cargo handling gear and equipment may include:	• Cargo pumps • Cranes • Derricks • Grabs • Hooks, wires and shackles • Slings
Cargo stowage plan must include:	• Cargo weight • Correct description and stowage of hazardous and dangerous goods • Description of cargo to be loaded • Load/discharge port • Segregation of non compatible cargo
Ballast management problems may include:	• Confirmation that the stowage plan conforms to stability requirements at all stages of loading and discharging • Contaminated ballast • Failure of ballast pumps
Cargo-related incidents or emergencies may include:	• Cargo handling gear failure • Cargo shift • Leakage • Spontaneous combustion

Unit Sector(s)

Not applicable.

Competency Field

Handling Cargo and Vessel Stability