



Australian Government

Department of Education, Employment and Workplace Relations

TDMMA107B PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

Revision Number: 1

TDMMA107B PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

Modification History

Not applicable.

Unit Descriptor

UNIT DESCRIPTOR:

This unit involves the skills and knowledge required to plan and oversee the safe and efficient loading, stowage, security and unloading of cargo.

Application of the Unit

Application of the unit	The unit has application in qualifications for Master, Chief Mate on a vessel of 500 GT or more operating in international waters, and Marine Engineers Class 1 and Class 2, i.e. Advanced Diplomas of Transport&Distribution (Maritime Operations - Master Unlimited), (Marine Engineering Class 1) and Marine Engineering Class 2).
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Licensing/Regulatory Information

Licensing/legislative requirements	The unit is consistent with the relevant sections of STCW 95, the International Ship and Port Facility Security (ISPS) Code and Marine Orders under the Australian Navigation Act 1912, describing requirements for a Master or Chief Mate on a vessel of 500 gross tonnage or more operating in international waters.
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Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

<i>Elements describe the essential outcomes of a unit of competency.</i>	<i>Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.</i>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Plan the loading, stowage, security and unloading of cargo	- a The cargo to be loaded or unloaded is identified and its characteristics and dimensions established - b Required communications between the vessel and the shore terminal are conducted prior to the vessel's arrival concerning loading and unloading arrangements - c The longitudinal stresses acting on vessel's hull for the intended cargo configuration are calculated - d The trim and stability of the vessel during loading/unloading operations and when loaded are calculated, including the use of a GZ curve - e The vessel's stowage plan is prepared and interpreted as per procedures
2 Load, stow and unload general cargo	- a Preparations for loading, stowage and unloading are carried out in accordance with operational and security procedures and stowage plan - b Relevant regulations, procedures and instructions pertaining to the type of cargo to be handled are accessed and interpreted prior to commencing operations

ELEMENT	PERFORMANCE CRITERIA
2 Load, stow and unload general cargo (continued)	- c Techniques used for cargo calculations and handling are selected and correctly applied according to the type of cargo to be loaded, stowed or unloaded - d Cargo is correctly identified, inspected and confirmed against documentation prior to commencement of loading, unloading and stowage operations - e Loading, stowage and unloading operations are carried out as per operational and security procedures and stowage plan for the type of cargo involved - f Communication is clear, concise and acknowledged at all times according to good cargo handling practice and regulations
3 Follow safety and hazard control procedures	- a Tests and inspections on cargo handling equipment are conducted in accordance with regulations and company procedures - b Cargo handling hazards are identified and action is taken to minimise or eliminate risk to personnel, cargo, vessel and the environment - c Safety, security and hazard minimisation procedures and regulations are followed at all times during cargo handling operations - d Where relevant, precautions and procedures necessary for gas freeing a tank and for the entry of personnel into a tank are correctly followed - e Where relevant, procedures and precautions necessary for entry into a pump room or other confined spaces on a vessel are correctly followed - f Action is taken in the event of a cargo handling incident or emergency to secure the cargo and the vessel and maintain the safety of the vessel and persons involved
4 Perform ballast management	- a Ballast requirements of port authority are identified and interpreted - b Ballast management procedures are carried out in accordance with company procedures and port authority requirements

ELEMENT	PERFORMANCE CRITERIA
	c Ballast management problems are identified and necessary action taken to minimise risk to the environment
5 Complete cargo handling documentation	a Independent cargo surveyors are used in the loading, stowage and unloading of cargo in accordance with company procedures b Correct log book entries are made relating to cargo handling operations and incidents c A letter of protest is used in any untoward incident relating to cargo operations and care d All cargo handling documentation is completed in accordance with requirements and regulations

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Required Skills and Knowledge

REQUIRED KNOWLEDGE

This describes the knowledge required for this unit.

- 1 IMO STCW 95 Convention and Code, the International Ship and Port Facility Security (ISPS) Code and AMSA Marine Orders applicable to the management of cargo handling operations
- 2 Relevant OH&S and cargo handling legislation, codes of practice, policies and procedures
- 3 ISM Code Safety Management Procedures as they relate to cargo handling operations
- 4 IMO SOLAS Convention
- 5 Methods for handling and securing various types of cargo, including the operation of various types and configurations of lifting gear
- 6 Regulations pertaining to cargo handling equipment and gear
- 7 Cargo handling hazards and problems and appropriate preventative and remedial action and solutions
- 8 Procedures for calculating the stresses on lifting gear used in cargo handling operations
- 9 Procedures for determining the forces acting on equipment used to lash cargo
- 10 Typical operational characteristics of different types of shipboard and terminal-based cargo handling equipment and facilities
- 11 Ways of restricting vessel's stress levels within permitted limits during loading/discharging of dry bulk cargoes
- 12 Effects of different types of cargo operations on vessel's trim and stability
- 13 Operational procedures and layouts of various types of shoreside loading and discharging terminals
- 14 Procedures for calculating the maximum deadweight available to a vessel that needs to subsequently enter various seasonal load-line zones
- 15 Effects on cargo handling of wind and weather
- 16 Ballast management issues and procedures
- 17 Typical types and sizes of shipping containers

REQUIRED KNOWLEDGE

- 18 Standard stowage position numbering systems used on container vessels
- 19 Procedures for determining a vessel's displacement by draught survey
- 20 Factors that affect the reading of a vessel's draught
- 21 Procedures for calculating the longitudinal stresses acting on a vessel's hull using both manual and computer techniques
- 22 Cargo handling communication techniques, including terminology used in cargo operations
- 23 Cargo handling documentation requirements, including documentation to limit claims on cargo carried
- 24 Documentation required to limit the claims on cargo carried

REQUIRED SKILLS

This describes the basic skills required for this unit.

- 1 Communicate effectively with other personnel when planning and ensuring the safe loading, stowage, security and unloading of cargo
- 2 Interpret and follow procedures for the security, safely handling, loading, stowing and carrying various types of cargo including:
 - i general cargo
 - ii dry bulk cargo
 - iii dangerous cargo
 - iv special and abnormal cargoes
 - v bulk liquids and gas cargoes
- 3 Identify the effect of cargo operations on trim and stability
- 4 Identify the operations of various types and configurations of lifting gear
- 5 Perform various methods of securing cargo
- 6 Determine the vessel's displacement by draught survey
- 7 Take proper care of cargo
- 8 Interpret and follow the procedures and identify documentation required to limit the claims on cargo carried

- 9 Perform ballast management procedures to protect the environment
- 10 Carry out calculations involved in:
 - i calculating the maximum deadweight available to a vessel that needs to subsequently enter various seasonal load-line zones
 - ii calculating the stresses on lifting gear
 - iii determining the forces acting on lashing equipment

Evidence Guide

Evidence Guide TDMMA107B PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO
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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 this Training Package.

1 Critical aspects of evidence required to demonstrate competency in this unit	Assessment must confirm appropriate knowledge and skills to: - a Plan and oversee cargo handling operations: 1 safely in both normal and emergency situations 2 in normal and adverse weather conditions 3 across a representative range of typical cargo handling contexts - b Exercise all required safety, security, environmental and hazard control precautions and procedures when overseeing the handling of cargo during loading/unloading and stowage operations - c Identify cargo handling problems and hazards and take appropriate action - d Communicate effectively with others during cargo handling operations

Evidence Guide TDMMA107B PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO
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2 Evidence required for demonstration of consistent performance	- a Performance is demonstrated consistently over a period of time and in a suitable range of contexts - b Applies underpinning knowledge and skills when: 1 planning and overseeing cargo handling operations 2 identifying and evaluating cargo handling problems and determining appropriate courses of action 3 identifying and implementing improvements to cargo handling procedures 4 applying safety precautions relevant to cargo handling operations 5 assessing operational capability of cargo handling equipment - c Shows evidence of application of relevant workplace procedures, including: 1 relevant sections of STCW, the International Ship and Port Facility Security (ISPS) Code and AMSA Marine Orders 2 ISM Code and associated vessel's safety management system and procedures 3 OH&S regulations and hazard prevention policies and procedures 4 issue resolution procedures 5 job procedures and work instructions
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Evidence Guide (continued)

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Evidence 2 required for demonstration of consistent performance (continued)	6 relevant manufacturer's guidelines relating to the use of machinery, including instructions on equipment capability and limitations 7 quality procedures (where existing) 8 security procedures 9 following on-board housekeeping processes 10 waste, pollution and recycling management processes d Action is taken promptly to report and/or rectify accidents and incidents in accordance with statutory requirements and company procedures e Work is completed systematically with required attention to detail f Recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions among crew and others
3 Context of assessment	a Assessment of competency must comply with the assessment requirements of the relevant maritime regulations b Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: 1 As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations, and 2 Appropriate practical assessment must occur: i at the registered training organisation; and/or ii on an appropriate working or training vessel

Evidence Guide (continued)

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4 Specific resources required for assessment

Access is required to opportunities to:

- a plan and manage the actual cargo loading/unloading operations of a vessel; and/or
- b plan and manage suitably simulated cargo loading/unloading operations over an appropriate range of cargo handling situations, weather and operational conditions

Range Statement

Range Statement

TDMMA107B PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

VARIABLE

SCOPE

1. GENERAL CONTEXT

a. Work must be carried out:	1 in compliance with mandatory rules and regulations and IMO Conventions and Codes, including the relevant sections of the AMSA Marine Orders and ensuring that applicable codes, guidelines and standards recommended by IMO, the classification societies and maritime industry organisations are taken into account
b. Work is performed:	1 relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

c. Work involves:	1 the planning and execution of a significant range of cargo handling techniques across a wide and often unpredictable variety of cargo types and operational contexts. Contribution to the development of a broad plan or strategy for cargo handling operations and stowage is required and accountability and responsibility for self and others in achieving the outcomes is involved
d. Work requires:	1 significant judgement in planning, technical and leadership functions related to cargo handling operations and procedures

2. WORKSITE ENVIRONMENT

a Cargo may be loaded or unloaded:	1 from any Australian or international commercial vessel
b Cargo handling operations may be carried out:	1 by day or night in both normal and emergency situations 2 under any permissible conditions of weather 3 at various shoreside loading and discharge terminals

Range Statement (continued)

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VARIABLE	SCOPE

Range Statement (continued)

TDMMA107B PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

c Types of cargo may include:	1 general cargo 2 containers 3 various types of solid bulk materials 4 various types of bulk liquids 5 special and abnormal cargo such as: - i refrigerated cargo and containers - ii pig iron, ingots and steel billets - iii mineral concentrates - iv extra heavy cargo
d Cargo handling equipment may include:	1 single swinging derricks 2 union purchase derricks 3 shipboard cranes 4 terminal-based cranes 5 pumps, valves and hoses
e Cargo handling hazards may include:	1 faulty cargo handling equipment 2 damaged cargo 3 cargo handling operations in poor weather or sea conditions 4 incorrectly stowed cargo 5 incorrectly lashed or secured cargo 6 using equipment beyond safe working limits 7 non-compliance with safe working procedures

Range Statement (continued)

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f Documentation and records may include:	1	ISM Code safety management system plans, procedures, checklists and instructions
	2	cargo handling operational orders and instructions
	3	relevant sections of IMO STCW Convention and Code and the International Ship and Port Facility Security (ISPS) Code
	4	relevant sections of AMSA Marine Orders

Range Statement (continued)

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VARIABLE	SCOPE
f Documentation and records may include: (continued)	5 vessel's log
	6 vessel's 'Cargo Securing Manual'
	7 vessel's Register of Materials Handling Equipment
	8 vessel and shore safety checklists
	9 company cargo handling procedures
	10 cargo handling equipment manufacturer's instructions and procedures
	11 instructions of relevant maritime authorities
	12 relevant Australian and international standards and regulatory requirements
	13 relevant international, Commonwealth, State and Territory OH&S legislation

Range Statement (continued)

TDMMA107B PLAN AND ENSURE SAFE LOADING, STOWAGE, SECURITY AND UNLOADING OF CARGO

g Applicable legislation, regulations and codes may include:

- 1 sections of IMO STCW Convention and Code and the International Ship and Port Facility Security (ISPS) Code related to cargo handling
- 2 relevant sections of AMSA Marine Orders
- 3 regulatory requirements related to problems with marine pest risks, precautions, solutions and responsibilities
- 4 International Grain Code
- 5 Lumber load-line requirements and the Code of Safe Practice for Ships carrying Timber Deck Cargo
- 6 IMO SOLAS Convention

Unit Sector(s)

Not applicable.

Field

Field MA Handling Cargo and Vessel Stability

Relationship to other units

Relationship to other units	The unit may be assessed in conjunction with other units that relate to the functions of the occupation(s) concerned.
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