



Australian Government

Department of Education, Employment and Workplace Relations

TDMMA1607B MANAGE LOADING AND EMBARKATION PROCEDURES ON ROLL-ON ROLL-OFF VESSELS

Revision Number: 1

TDMMA1607B MANAGE LOADING AND EMBARKATION PROCEDURES ON ROLL-ON ROLL-OFF VESSELS

Modification History

Not applicable.

Unit Descriptor

UNIT DESCRIPTOR:

This unit involves the skills and knowledge required to manage the loading/unloading and embarkation/disembarkation procedures on roll-on roll-off vessels, including planning the loading/unloading operations and stability of the vessel, managing the loading/unloading and embarkation/disembarkation procedures, and supervising the opening, closing and securing the hull openings on a roll-on roll-off passenger vessel.

Application of the Unit

Application of the unit	The unit has application within a supplementary Statement of Attainment for competencies required by a Master or Chief Mate on a roll-on roll-off vessel.
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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, and stability of the vessel	- a Stability and stress information for a roll-on roll-off vessel is obtained and interpreted - b Stability and trim for various conditions of loading are calculated using stability calculators or computer programs provided - c Load factors are calculated for decks in accordance with established procedures - d The impact of ballast and fuel transfers on stability, trim and stress are calculated in accordance with established procedures - e Weight distribution is organised to maintain the vessel within acceptable stability limits for anticipated operation situations likely to be experienced during the voyage - f Calculations are made to determine the draught and centre of gravity of the vessel after adding, removing or shifting weight
ELEMENT	PERFORMANCE CRITERIA
1 Plan the loading, and stability of the vessel (continued)	- g Trim, draughts and list of the vessel are controlled as required to ensure they are suitable to progress all anticipated vessel operations - h Plans for the loading/unloading, embarkation/disembarkation, and ballast and fuel management are prepared in accordance with established

ELEMENT	PERFORMANCE CRITERIA
	procedures, vessel's ISM Code safety management system, and regulatory requirements - i Checklists for use in the loading and embarkation of a roll-on roll-off vessel are obtained or developed - j Operational plans and procedures for the loading/unloading, embarkation/disembarkation, and ballast and fuel management are documented and made available to relevant staff in accordance with tanker procedures and regulatory requirements
2 Manage the loading/unloading and embarkation/disembarkation procedures	- a Ramps are lowered and hoisted in accordance with established procedures - b Vehicles, rail cars and other cargo transport units are loaded and discharged in accordance with established procedures and loading plan - c Retractable vehicle decks are set up and stowed in accordance with established procedures - d Special safeguards, procedures and requirements regarding the carriage of dangerous goods on board roll-on roll-off vessels are applied in accordance with regulations - e Passengers are embarked and disembarked in accordance with established procedures and embarkation plan - f Appropriate special attention is provided during embarkation and disembarkation procedures for disabled persons and persons needing assistance
3 Open, close and secure hull openings on a roll-on roll-off passenger vessel	- a Established procedures are properly applied for the opening, closing and securing of bow, stern and side doors and ramps and the operation of associated systems - b Appropriate checks are made to confirm the watertight integrity of the vessel prior to departure - c Problems with the operation of bow, stern and side doors and ramps and associated systems are promptly reported in accordance with established procedures - d Surveys on the proper sealing of hull openings on the vessel are conducted in accordance with established procedures and regulatory requirements

ELEMENT	PERFORMANCE CRITERIA
4 Complete cargo handling and passenger embarkation/disembarkation documentation	- a Correct reports are completed relating to cargo and vehicle loading/unloading and passenger embarkation/disembarkation operations and incidents in accordance with established procedures and regulatory requirements - b All documentation is completed in accordance with requirements and regulations

Required Skills and Knowledge

REQUIRED KNOWLEDGE

This describes the knowledge required for this unit.

- 1 Sections of IMO STCW 95 Code and AMSA Marine Orders applicable to roll-on roll-off vessels
- 2 Relevant OH&S and pollution control legislation and policies
- 3 Procedures and regulatory requirements for cargo loading/unloading and passenger embarkation/disembarkation on roll-on roll-off vessels, including:
 - a cargo loading and discharging preparations and procedures
 - b the use of cargo checklists and passenger lists, including the vessel/shore checklist
 - c regulations and procedures for the control of entry into confined spaces
 - d proper ballasting and deballasting procedures
 - e emergency procedures

REQUIRED KNOWLEDGE

- 4 Maritime communication techniques as they are applied in cargo/vehicle handling and passenger embarkation/disembarkation procedures on a roll-on roll-off passenger vessel
- 5 Cargo handling systems and equipment and the procedures for their use
- 6 The basic principles and trends in vessel design and cargo handling systems on roll-on roll-off vessels, including:
 - a typical deck arrangements
 - b an understanding of freeboard and bulkhead deck, vehicle decks, passenger spaces, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead
 - c arrangements for the opening, closing and securing of bow, stern and side doors and ramps and associated systems
 - d factors that affect the stability, trim and stress on a roll-on roll-off vessel
 - e ventilation and atmosphere control systems
 - f arrangements for setting up and stowing retractable vehicle decks
- 7 Properties and application of materials used in the construction of roll-on roll-off vessels
- 8 The characteristics of dangerous cargoes, including:
 - a the physical characteristics of various types of dangerous cargo
 - b handling precautions and stowing procedures for classes of dangerous cargo as per IMDG Code and material data safety sheets
 - c the practical significance of flashpoint, flammable range and auto-ignition temperature for various classes of dangerous cargo
- 9 Principles and procedures for emergency operations on roll-on roll-off vessels, including:
 - a the importance of developing emergency plans
 - b techniques for emergency shut down of cargo operations
 - c actions to be taken in the event of failure of services critical to the wellbeing of passengers and cargo

- b techniques for emergency shut down of cargo operations
 - d actions to be taken following a collision or grounding
 - e the correct procedures for the use of personal protection clothing and equipment and lifesaving appliances
 - f the procedures for entry into and effecting a rescue from enclosed spaces
- 10 Theory and calculations of vessel stability and dynamics including:
- a computation of hydrostatic stability data of a vessel
 - b calculation of a vessel's centre of gravity, centre of buoyancy and metacentre
 - c calculation of the transverse and longitudinal stability using hydrostatic data
 - d calculation of the moment of statical stability at small angles of heel
 - e determination of the centre of gravity of a vessel using an inclining experiment and effect of suspended weights
 - f determining the required correction for the height of centre of gravity (kg) for the free surface effect
 - g determination of the values of the righting lever and construction of righting lever curves
- 11 Calculations for change of draught, trim and heel when entering different water densities and due to bilging of compartments
- a changes to draught, trim and heel due to adding or removing fuel, ballast or cargo
 - b displacement, wetted surface, form coefficients, tonne per centimetre immersion, application of Simpson's rules to first and second moments of area, centroids and centres of pressure
- 12 Potential problems related to the control of trim and stability for roll-on roll-off vessels and appropriate action and solutions, including:
- a free surface of a liquid
 - b shift of cargo
 - c wind heel
 - d handling of heavy weights
 - e excessive trim

- b techniques for emergency shut down of cargo operations
- f large swell conditions
- g dry docking
- h grounding

- b techniques for emergency shut down of cargo operations
- 13 Principles of synchronous rolling and methods for its control, including an understanding of the effect on the rolling period of a vessel due to the radius of gyration
- 14 Causes and repercussions of a heeling vessel
- 15 Mandatory knowledge and skills in personal survival techniques, firefighting and fire prevention required of all seafarers, as per Section A VI/1 of the IMO STCW 95 Code

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REQUIRED SKILLS

This describes the basic skills required for this unit.

- 1 Read and interpret instructions, regulations, procedures and information relevant to the management of the loading and embarkation procedures on roll-on roll-off vessels
- 2 Communicate effectively with others when managing the loading and embarkation procedures on roll-on roll-off vessels
- 3 Provide leadership to others on the loading and embarkation procedures on roll-on roll-off vessels
- 4 Take appropriate initiatives related to the loading and embarkation procedures on roll-on roll-off vessels
- 5 Interpret and apply security and safety practices and regulations when managing the loading and embarkation procedures on roll-on roll-off vessels
- 6 Modify activities dependent on differing workplace contingencies, risk situations and environments
- 7 Identify and solve problems associated with the loading and embarkation procedures on roll-on roll-off vessels and take appropriate action based on available information
- 8 Monitor and anticipate problems and risks related to the loading and embarkation procedures on roll-on roll-off vessels, and take appropriate action
- 9 Adapt to differing types of vessels, port facilities, vehicles, cargoes and

- b techniques for emergency shut down of cargo operations equipment
- 10 Monitor the use of equipment required for the loading and embarkation procedures on roll-on roll-off vessels

Evidence Guide

Evidence Guide
TDMMA1607B MANAGE LOADING AND EMBARKATION
PROCEDURES ON ROLL-ON ROLL-OFF VESSELS

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 the loading/unloading, and stability of a roll-on roll-off vessel - b Manage the cargo loading/unloading and passenger embarkation/disembarkation procedures on a roll-on roll-off vessel - c Ensure the correct opening, closing and securing of hull openings on a roll-on roll-off vessel - d Complete cargo handling and passenger embarkation/disembarkation documentation - e Identify typical problems that may occur during cargo loading/unloading and passenger embarkation/disembarkation and take appropriate action - f Apply relevant international conventions, IMO and national codes, roll-on roll-off vessel operations guides and port regulations related to vessel operations - g Communicate effectively with others during cargo handling and passenger embarkation/disembarkation operations
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Evidence Guide

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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 Consistently applies underpinning knowledge and skills when:
 - 1 planning the loading/unloading, and stability of a roll-on roll-off vessel
 - 2 managing the loading/unloading and embarkation/disembarkation procedures a roll-on roll-off vessel
 - 3 confirming the correct opening, closing and securing of the hull openings
 - 4 identifying and evaluating cargo/vehicle handling and passenger embarkation/disembarkation problems and determining appropriate courses of action
 - 5 identifying and implementing improvements in cargo/vehicle handling and passenger embarkation/disembarkation procedures
 - 6 applying safety and hazard control precautions relevant to cargo/vehicle handling and passenger embarkation/disembarkation operations
- c Shows evidence of application of relevant workplace procedures, including:
 - 1 relevant sections of maritime regulations
 - 2 OH&S regulations and hazard prevention policies and procedures

Evidence Guide (continued)

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2 Evidence required for demonstration of consistent performance

- 3 ISM Code safety management system procedures and work instructions
- 4 relevant manufacturer's guidelines relating to the use of

Evidence Guide (continued)

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performance (continued)	cargo handling plant and equipment 5 following on-board housekeeping processes d Action is taken promptly to report and/or rectify operational 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
4 Specific resources required for assessment	Access is required to opportunities to: a participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to manage cargo/vehicle handling and passenger embarkation/disembarkation procedures on a roll-on roll-off passenger vessel; and/or b manage cargo/vehicle handling and passenger embarkation/disembarkation procedures on a roll-on roll-off

Evidence Guide (continued)

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passenger vessel

Range Statement

Range Statement

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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 the relevant sections of the AMSA Marine Orders and IMO STCW 95 Convention and Code, ISM Code, roll-on roll-off vessel safety guides and port regulations related to roll-on roll-off vessel operations
b. Work is performed:	1 relatively independently under broad operational requirements, with accountability and responsibility for self and others in achieving the prescribed outcomes

Range Statement

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c. Work involves:	1 the application of a significant range of operational and supervisory principles and procedures, safety precautions and hazard minimisation strategies to the management of the loading/unloading, vessel stability and the embarkation/disembarkation of passengers on a roll-on roll-off vessel. Contribution to the development of a broad plan for cargo handling, vessel stability and the embarkation/disembarkation of passengers 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 the loading/unloading, and embarkation/disembarkation of passengers on a roll-on roll-off vessel

2. WORKSITE ENVIRONMENT

a Vessel may include:	1 any Australian or international roll-on roll-off passenger and vehicular transport vessel
b Loading/unloading, and embarkation/disembarkation may be carried out:	1 by day or night in both normal situations 2 under any possible operational conditions

Range Statement (continued)

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VARIABLE	SCOPE
c Types of cargo may include:	1 road vehicles, including cars trucks, buses, etc. 2 rail cars 3 other forms of transport units 4 containers on transport units 5 general cargo 6 dangerous goods
d Measures to control the trim and stability of the vessel may include:	1 adjusting weight distribution of load 2 pumping ballast water to compensate for load distribution 3 pumping of flooded compartments 4 implementing damage control measures to maximise watertight integrity of hull where it has been damaged
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 dangerous cargo 5 incorrectly stowed cargo 6 poor ventilation on vehicle decks 7 incorrectly lashed or secured cargo/vehicles, rail cars or other transport units 8 incorrect procedures for opening, closing and securing the

Range Statement (continued)

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	hull openings of the vessel
	9 using equipment beyond safe working limits
	10 non-compliance with safe working procedures
f Documentation and records may include:	1 ISM Code safety management system plans, procedures, checklists and instructions 2 operational orders 3 established vehicle loading/discharging procedures 4 established passenger embarkation/disembarkation procedures 5 passenger lists 6 sections of the AMSA Marine Orders and the IMO STCW Convention and Code related to roll-on roll-off vessels 7 'Trim and Stability Booklet'

Range Statement (continued)

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VARIABLE	SCOPE
f Documentation and records may include: (continued)	8 material data safety sheets 9 IMDG Code 10 vessel manufacturer's instructions and recommended procedures 11 OH&S procedures relevant to roll-on roll-off vessels 12 instructions of relevant maritime authorities concerning the operation of roll-on roll-off vessels

Range Statement (continued)

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	13 relevant Australian and international standards
g Applicable legislation, regulations and codes may include:	1 sections of the maritime regulations related to roll-on roll-off vessels, including the International Ship and Port Facility Security (ISPS) Code 2 relevant sections of AMSA Marine Orders 3 IMDG Code 4 Code of Practice for Cargo Stowage and Securing 5 MARPOL Convention 6 SOLAS Convention 7 notices and instructions of relevant maritime authorities concerning the operation of roll-on roll-off vessels 8 relevant OH&S and pollution control legislation

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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