



Australian Government

Department of Education, Employment and Workplace Relations

TDMMA507B MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

Release: 1

TDMMA507B MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

Modification History

Not applicable.

Unit Descriptor

UNIT DESCRIPTOR:

This unit involves the skills and knowledge required to safely manage procedures for the handling, loading and discharging of chemical cargoes on chemical tankers, including completion of required cargo calculations, development and implementation of chemical loading and discharging plans and procedures, operation of vapour-return systems, use of checklists, chemical cargo maintenance, completion of gas freeing and tank cleaning operations, proper use of absorption and wetting agents and detergents, use and maintenance of inert atmospheres, safe control of entry into pump rooms and confined spaces, correct use of detecting and safety equipment, and proper disposal of waste and washings.

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 chemical tanker
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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.
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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, discharge and condition maintenance of chemical cargo	<p>a Plans for the loading, discharge and condition maintenance of chemical cargoes are obtained or prepared in accordance with company procedures, tanker's ISM Code safety management system, regulatory requirements and established maritime practice</p> <p>b Checklists for use in the loading, discharge and condition maintenance of chemical cargoes are obtained or developed</p> <p>c Operational plans and procedures for the loading, discharge, condition monitoring and maintenance of chemical cargoes are documented and made available to relevant staff in accordance with tanker procedures and regulatory requirements</p>

TDMMA507B MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

ELEMENT	PERFORMANCE CRITERIA

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2 Manage the loading, discharge and condition maintenance of chemical cargo	<ul style="list-style-type: none"> a Operational plans and procedures for the loading, discharge, condition monitoring and maintenance of chemical cargoes are implemented in accordance with operational and regulatory requirements b Personnel involved in chemical cargo handling and maintenance operations are correctly supervised in accordance with company and regulatory requirements c Cargo segregation and cargo transfer procedures are correctly carried out in accordance with operational and regulatory requirements d Checklists are correctly used in accordance with tanker procedures e The condition of chemical cargo is correctly maintained in accordance with established procedures and chemical tanker practice f Chemical cargo gauging, sampling and testing is carried out in accordance with established tanker procedures and regulatory requirements g Established procedures and precautions are applied during tank cleaning and gas freeing operations h Cargo temperature control systems and their associated instrumentation and alarms are correctly monitored and maintained i Chemical cargo venting systems, vapour-return system, and accommodation ventilation and air-lock systems are correctly used j Ballasting and deballasting procedures for a chemical tanker are followed in accordance with operational requirements and regulatory requirements k Required communication with relevant personnel is correctly and constantly maintained throughout loading, discharging, handling and condition maintenance operations involving chemical cargo

ELEMENT	PERFORMANCE CRITERIA
3 Ensure the implementation of safety and hazard control procedures	<ul style="list-style-type: none"> a Appropriate personal protection clothing and equipment is correctly used throughout loading, discharge, handling and condition maintenance operations involving chemical cargo b Hazard minimisation and safety precautions for the loading, discharging and handling of chemical products are carried out in accordance with regulatory requirements and established chemical tanker practice c Appropriate monitoring equipment is correctly used throughout loading, discharge, handling and condition maintenance operations d Emergency situations during loading or discharging of cargo or cargo condition monitoring and maintenance are identified and acted upon in accordance with established tanker emergency procedures and regulatory requirements

<p>TDMMA507B MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES</p>

ELEMENT	PERFORMANCE CRITERIA
4 Implement pollution prevention measures	<ul style="list-style-type: none"> a Air and water pollution prevention procedures are implemented in accordance with established tanker practice and regulatory requirements b Required action is taken in the event of a chemical spillage in accordance with regulatory requirements and established chemical tanker procedures c All relevant information is immediately reported to appropriate officials when a spill is detected or when a malfunction has occurred which may pose a risk of a spill d Shore-based personnel are immediately notified of a chemical spill e Shipboard spill containment and emergency procedures are initiated in accordance with established tanker practice and regulatory requirements

ELEMENT	PERFORMANCE CRITERIA
5 Complete cargo handling documentation	<ul style="list-style-type: none">a Correct reports are completed relating to chemical cargo handling operations and incidents as per established procedures and regulatory requirementsb All cargo handling documentation is completed in accordance with requirements and regulations

Required Skills and Knowledge

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 handling, loading and discharging of chemical cargoes
- 2 Communicate effectively with others when managing the handling, loading and discharging of chemical cargoes
- 3 Provide leadership to others on matters related the handling, loading and discharging of chemical cargoes
- 4 Take appropriate initiatives related to the handling, loading and discharging of chemical cargoes
- 5 Interpret and apply security and safety practices and regulations when managing the handling, loading and discharging of chemical cargoes
- 6 Modify activities dependent on differing workplace contingencies, risk situations and environments
- 7 Identify and solve problems associated with the handling, loading and discharging of chemical cargoes and take appropriate action based on available information
- 8 Monitor and anticipate problems and risks related to the handling, loading and discharging of chemical cargoes, and take appropriate action
- 9 Adapt to differing types of vessels, port facilities, cargoes and equipment
- 10 Monitor the use of equipment required for the handling, loading, monitoring and discharging of chemical cargoes

REQUIRED KNOWLEDGE

This describes the knowledge required for this unit.

- 1 Relevant sections of IMO STCW 95 Code and AMSA Marine Orders applicable to chemical tankers
- 2 Relevant OH&S and pollution control legislation, codes of practice, policies and procedures

REQUIRED KNOWLEDGE

- 3 Procedures and regulatory requirements for loading, discharge, handling and condition monitoring of chemical cargo, including:
 - a typical calculations required when coordinating the handling of chemical cargo
 - b procedures for the preparation of loading and discharge plans for multiple grade tanker cargoes with due regard to cargo segregation and cargo care on passage
 - c cargo loading and discharging preparations and procedures
 - d purpose and use of checklists, including the vessel/shore checklist
 - e need for correct supervision and the use of monitoring equipment when handling chemical cargoes
 - f cargo condition monitoring and maintenance on passage and in harbour
 - g principles and procedures for the segregation of cargoes
 - h procedures for cargo transfer and changing cargoes
 - i the use and maintenance of inert atmospheres during cargo operations
 - j procedures for controlling entry into pump rooms and confined spaces
 - k the principles of operation of gas detection and safety equipment
 - l gas detection and safety equipment requirements for various shipboard scenarios on a chemical tanker
 - m procedures to prevent air and water pollution, including disposal of wastes and washings
 - n procedures for tank cleaning and gas freeing operations, including the use of absorption, wetting agents and detergents
 - o cargo gauging, sampling and testing
 - p ballasting and deballasting
 - q emergency procedures, i.e. pre-planned action in the event of spillages, leaks, fire, collision, stranding, emergency cargo discharge and personnel casualty

REQUIRED KNOWLEDGE

- 4 Chemical cargo handling systems and equipment and the procedures for their use
- 5 Principles of chemical cargo containment, including:
 - a containment systems
 - b rules
 - c surveys

TDMMA507B MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

- d tank construction
 - e materials
 - f coatings
 - g temperature control
 - h insulation
 - i compatibility
- 6 The properties and characteristics of chemicals and their vapours, including:
 - g temperature control
 - h insulation
 - i compatibility
 - a the characteristics of chemicals typically carried
 - b toxicity of various chemical cargoes
 - c critical temperatures of typical chemical cargoes
 - d hazards of typical chemical cargoes and measures for hazard control
 - e safety guides applicable to typical chemical cargoes carried

- d tank construction
- 7 Principles of toxicity of chemicals, including:
 - a the modes by which chemicals and their vapours may be toxic
 - b the toxic properties of inhibitors and of products of combustion of both materials of construction and of chemicals carried
 - c acute and chronic effects of toxicity
 - d systemic poisons and irritants
 - e the threshold limit value (TLV)
 - f hazards of skin contact, inhalation and ingestion
 - g medical first aid and administering of antidotes
- 8 Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of chemical cargoes

Evidence Guide

Evidence Guide

TDMMA507B MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES
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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.

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| 1 Critical aspects of evidence required to demonstrate competency in this unit | <p>Assessment must confirm appropriate knowledge and skills to:</p> <ul style="list-style-type: none">a Manage the safe loading, discharge, handling and condition maintenance of cargo on a chemical tankerb Ensure all required safety and hazard control procedures are implemented during loading, discharge, handling and condition monitoring and maintenance operationsc Identify typical problems that may occur during chemical cargo loading, discharge, handling and condition maintenance operations and take appropriate action |
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	<ul style="list-style-type: none"> d Identify emergency situations that may arise during chemical operations and take appropriate action e Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to chemical tanker cargo operations f Communicate effectively with others during chemical cargo handling and maintenance operations
2 Evidence required for demonstration of consistent performance	<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 1 managing the safe loading, discharge, handling and condition maintenance of cargo on a chemical tanker 2 identifying and evaluating chemical cargo handling problems and determining appropriate courses of action 3 identifying and implementing improvements to chemical cargo handling procedures 4 applying safety and hazard control precautions relevant to chemical cargo handling operations c Shows evidence of application of relevant workplace procedures, including: <ul style="list-style-type: none"> 1 relevant sections of IMO STCW 95 Code and AMSA Marine Orders 2 OH&S regulations and hazard prevention policies and procedures

Evidence Guide (continued)

TDMMA507B MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

2 Evidence required for demonstration of consistent performance (continued)	<ul style="list-style-type: none"> 3 ISM Code safety management system procedures and work instructions on the conduct of maintenance on chemical tankers 4 relevant manufacturer's guidelines relating to the use of chemical cargo handling plant and equipment, including instructions on equipment capability and limitations 5 following on-board housekeeping processes 6 pollution management 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	<ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 1 As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations, and 2 Appropriate practical assessment must occur: <ul style="list-style-type: none"> i at the registered training organisation; and/or ii on an appropriate working or training vessel

4 Specific resources required for assessment	<p>Access is required to opportunities to:</p> <ul style="list-style-type: none"> a participate in a range of practical exercises, case studies and/or other exercises that demonstrate the skills and knowledge to manage the safe loading, discharge, handling and condition maintenance of cargo on a chemical tanker; and/or b manage the safe loading, discharge, handling and condition maintenance of cargo on board an operational chemical tanker
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Range Statement

Range Statement

TDMMA507B MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

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, tanker safety guides and port regulations related to chemical tanker cargo 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.

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, discharge, handling and condition maintenance of cargo on a chemical tanker. Contribution to the development of a broad plan for chemical cargo handling and maintenance operations 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 handling and condition maintenance of cargo on a chemical tanker.

2. WORKSITE ENVIRONMENT

a Vessel may include:	1 any Australian or international chemical tanker
b Chemical cargo handling operations may be carried out:	1 by day or night in both normal and emergency situations 2 under any possible operational conditions 3 during loading and discharging of cargo 4 during ballasting and deballasting 5 during chemical cargo condition monitoring and maintenance 6 during chemical cargo sampling

Range Statement (continued)

TDMMA507B MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES

VARIABLE	SCOPE

c Operational cargo handling cycle of a chemical tanker may include:	<ol style="list-style-type: none"> 1 chemical cargo loading preparation and operations 2 cargo monitoring and maintenance operations during a loaded voyage 3 chemical cargo discharging preparation and operations 4 tank stripping and cleaning operations 5 ballasting operations 6 maintenance operations during a ballast voyage 7 deballasting operations
d Chemical cargo handling systems and related equipment may include:	<ol style="list-style-type: none"> 1 chemical cargo pumps and pumping arrangements, venting and vapour-return systems, piping systems and valves 2 tank temperature control systems and alarms 3 filters and strainers 4 gas freeing systems 5 storage, generation and distribution systems 6 temperature and pressure monitoring systems 7 cargo vent systems 8 cargo vapour-return systems 9 tank cleaning systems 10 liquid recirculation and reliquefaction systems 11 cargo gauging, instrumentation systems and alarms
e Personal protection clothing and equipment may include:	<ol style="list-style-type: none"> 1 masks and goggles 2 protective clothing, including headgear, gloves and footwear 3 breathing apparatus 4 resuscitation equipment

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| 5 | escape and rescue equipment |
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Range Statement (continued)

TDMMA507B MANAGE PROCEDURES FOR THE HANDLING, LOADING AND DISCHARGING OF CHEMICAL CARGOES
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f Hazards associated with chemical cargoes may include:	1	reactivity hazards, including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents
	2	environmental hazards to air and water
	3	spills or release of toxic fluids, vapours and gases involving skin contact, inhalation or ingestion
	4	corrosion hazards to personnel, vessel structures and equipment
	5	working in confined spaces
g Documentation and records may include:	1	ISM Code safety management system plans, procedures, checklists and instructions
	2	operational orders
	3	established tanker and company chemical cargo operations procedures
	4	sections of the AMSA Marine Orders and the IMO STCW Convention and Code related to chemical tankers
	5	'Safety in Chemical Tankers' ICS
	6	'Tanker Safety Guide (Chemical Tankers)' ICS
	7	International Safety Guide for Oil Tankers and Terminals ICS/OCIMF
	8	Ship to Shore Safety Checklist, ICS/OCIMF
	9	Ship to Ship Transfer Guide (Petroleum), ICS/OCIMF
	10	tanker manufacturer's instructions and recommended procedures

	<ul style="list-style-type: none"> 11 OH&S and pollution prevention procedures relevant to the handling of chemical cargoes 12 instructions of relevant maritime authorities concerning chemical cargo operations 13 relevant Australian and international standards
h Applicable legislation, regulations and codes may include:	<ul style="list-style-type: none"> 1 sections of the IMO STCW 95 Convention and Code related to chemical tankers, including the International Ship and Port Facility Security (ISPS) Code 2 relevant sections of AMSA Marine Orders 3 instructions of relevant maritime authorities concerning chemical cargo operations 4 relevant international, Commonwealth, State and Territory 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 the unit <i>TDDMF1501B Plan and implement special safety, maintenance and emergency procedures for chemical tankers.</i>
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