



Australian Government

Department of Education, Employment and Workplace Relations

TDMMF1507B PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

Release: 1

TDMMF1507B PLAN AND IMPLEMENT SPECIAL SAFETY, MAINTENANCE AND EMERGENCY PROCEDURES FOR CHEMICAL TANKERS

Modification History

Not applicable.

Unit Descriptor

UNIT DESCRIPTOR:

This unit involves the skills and knowledge required to plan and implement special safety, maintenance and emergency procedures for chemical tankers, including developing vessel emergency plans, carrying out emergency shut down of chemical cargo operations, taking special precautions when carrying out on-board maintenance operations, applying medical first aid in relation to chemical cargo accidents, using resuscitation and decontamination equipment and breathing apparatus and escape equipment, carrying out safe entry into and rescue from enclosed spaces, and taking appropriate action following collision, stranding or chemical spillage.

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 Develop and implement operational and emergency plans relevant to chemical tankers	. a Plans for tanker operations are prepared in accordance with operational orders, company procedures, the tanker's ISM Code safety management system, international and national codes, conventions and regulatory requirements, and company procedures b Safety and emergency procedures are planned and implemented in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements, and company procedures c Tests, inspections and repairs of tanker machinery and equipment and associated safety devices, control systems and alarms are conducted in accordance with safety regulations and company procedures d Action is taken in the event of machinery or equipment failure or emergency to secure the machinery and the tanker and maintain the safety of the tanker and persons involved and shipboard emergency, and contingency plans are followed e Correct emergency action is taken in the event of the failure of shipboard systems or services essential to the safe carriage, loading and discharge of chemical cargo

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ELEMENT	PERFORMANCE CRITERIA
1 Develop and implement operational and emergency plans relevant to chemical tankers (continued)	d Action is taken in the event of machinery or equipment failure or emergency to secure the machinery and the tanker and maintain the safety of the tanker and persons involved and shipboard emergency, and contingency plans are followed e Correct emergency action is taken in the event of the failure of shipboard systems or services essential to the safe carriage, loading and discharge of chemical cargo f Emergency shut down of chemical cargo operations is initiated upon identification of a defined emergency situation in accordance with the tanker's ISM Safety Management Plan, international and national codes, conventions and regulatory requirements, and company procedures g Escape equipment, breathing apparatus, personal protective clothing and equipment, resuscitation equipment, and decontamination equipment are correctly used in emergency situations in accordance with manufacturer's instructions, regulatory requirements and company procedures h Appropriate action is taken following collision, stranding, or chemical spillage in accordance with the vessel's emergency plans and procedures and relevant international and national codes, conventions and regulatory requirements i Appropriate medical first aid is applied in relation to chemical cargo accidents in accordance with established first aid practice and company procedures j All emergency and safety incidents are reported and recorded in accordance with the tanker's ISM Code safety management system, regulatory requirements and company procedures

ELEMENT	PERFORMANCE CRITERIA
2 Take special precautions when carrying out maintenance operations on chemical tankers	- a Special maintenance procedures are developed and implemented that take due account of the potential hazards that may occur during maintenance on a chemical tanker - b Maintenance and repair hazards are identified and action is taken to minimise or eliminate risk to personnel, tanker and the environment - c Safety, hazard minimisation and pollution control procedures and national and international regulations are followed at all times during maintenance and repair operations - d Personal protective clothing and equipment are correctly used when carrying out maintenance work on a chemical tanker

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ELEMENT	PERFORMANCE CRITERIA
2 Take special precautions when carrying out maintenance operations on chemical tankers (continued)	- e When required during maintenance operations, breathing apparatus is correctly used in accordance with manufacturer's instructions, regulatory requirements and company procedures - f Where relevant, procedures and precautions necessary for entry into a pump room, tanks or other confined spaces when carrying out maintenance operations on a chemical tanker are correctly followed

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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 for chemical tankers
- 2 Relevant OH&S and pollution control legislation, codes of practice, policies and procedures
- 3 Safety 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 the purpose and use of checklists, including the vessel/shore checklist
 - e the importance of 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 principle of operation of gas detection and safety equipment

REQUIRED KNOWLEDGE

- 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 the procedure 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. preplanned action in the event of spillages, leaks, fire, collision, stranding, emergency cargo discharge and personnel casualty
- 4 Special safety precautions with respect to repair and maintenance work on a chemical tanker, particularly maintenance activities that affect pumping, piping, electrical and control systems, which may be contaminated with toxic vapours or liquid
- 5 The hazards associated with chemical cargoes, including:
- a an understanding of the types of hazards and their causes

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- b safety and hazard minimisation procedures used on chemical tankers
- c the design features of the vessels which minimise or eliminate the major hazards on a chemical tanker
- d potential health hazards of various chemical cargoes and the means to prevent related safety incidents
- e basic toxicological terminology
- f routes of entry of toxins to the human body
- g special first aid measures which may be required on a chemical tanker, including administering antidotes when dealing with a safety incident involving chemicals

- b safety and hazard minimisation procedures used on chemical tankers
- 6 Maritime communication techniques as they are applied in the loading, discharge, handling and condition monitoring of chemical cargo
- 7 Principles and procedures for emergency operations on a chemical tanker, including:
 - a the importance of developing vessel emergency plans
 - b techniques for emergency shut down of cargo operations on a chemical tanker
 - c actions to be taken in the event of failure of services essential to chemical cargo
 - d actions to be taken on a chemical tanker following a collision, grounding or spillage
 - e the correct procedures for the use of breathing apparatus, escape equipment, resuscitation equipment, protective clothing and decontamination equipment
 - f procedures for entry into and effecting a rescue from enclosed spaces on a chemical tanker
- 8 Principles of chemical cargo containment, including:
 - a containment systems
 - b rules
 - c surveys
 - d tank construction
 - e materials and coatings
 - f temperature control
 - g insulation
 - h compatibility
 - i medical first aid and administering of antidotes
- 9 The properties and characteristics of chemicals and their vapours, including:
 - a the characteristics of chemicals typically carried
 - b toxicity of various chemical cargoes

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- c critical temperatures of typical chemical cargoes
 - d hazards of typical chemical cargoes and measures for hazard control
 - e safety guides applicable for typical chemical cargoes carried
- 10 Basic 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

- c critical temperatures of typical chemical cargoes

REQUIRED SKILLS

This describes the basic skills required for this unit.

- 1 Read and interpret instructions, regulations, procedures and information relevant to 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 and discharging of chemical cargoes

Evidence Guide

Evidence Guide

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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 implement special safety, maintenance and emergency procedures on a chemical tanker - b Identify typical safety, maintenance and emergency problems and hazards on a chemical tanker and take appropriate action - c Apply relevant international conventions, IMO and national codes, tanker safety guides and port regulations related to chemical tanker cargo operations - d Communicate effectively with others when carrying out special safety, maintenance and emergency procedures on a chemical tanker
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 and implementing special safety, maintenance and emergency procedures for chemical tankers 2 identifying and evaluating chemical cargo safety, maintenance and emergency problems and determining appropriate courses of action 3 identifying and implementing improvements to chemical cargo safety, maintenance and emergency procedures - c Shows evidence of application of relevant workplace procedures, including: 1 relevant sections of IMO STCW Convention and Code and AMSA Marine Orders 2 OH&S and pollution control regulations and hazard prevention policies and procedures 3 ISM Code safety management system procedures and work instructions on the checking and repair of shipboard machinery, including machinery specifications and directions on equipment capability and limitations

	4 ISM Code safety management system and quality procedures (where existing) 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 established procedures

Evidence Guide (continued)

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2 Evidence required for demonstration of consistent performance (continued)	- 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 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

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| | knowledge to plan and implement special safety, maintenance and emergency procedures for chemical tankers; and/or |
| b | plan and implement special safety, maintenance and emergency procedures on board an operational chemical tanker |

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 maritime regulations, tanker safety guides and port regulations related to chemical tanker safety and 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

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 application of special safety precautions, operational procedures and hazard minimisation strategies to the management of the operations, maintenance and emergency situations on a chemical tanker. Contribution to the development of integrated safety management plan for a chemical tanker 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 development and implementation of an ISM management plan for operations, maintenance activities and emergencies on a chemical tanker

2. WORKSITE ENVIRONMENT

a Vessel may include:	1 any Australian or international commercial chemical tanker
b Operational, maintenance and emergency procedures 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)

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VARIABLE	SCOPE
c Operational cargo handling cycle of a chemical tanker may include:	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:	1 chemical cargo pumps and pumping arrangements and 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

VARIABLE	SCOPE
	11 cargo gauging, instrumentation systems and alarms
e Personal protection clothing and equipment may include:	1 masks and goggles 2 protective clothing, including headgear, gloves and footwear 3 breathing apparatus 4 resuscitation equipment 5 escape and rescue equipment

Range Statement (continued)

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VARIABLE	SCOPE
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 and ingestion 4 corrosion hazards to personnel, vessel structures and equipment 5 working in confined spaces
g Documentation /records may include:	1 ISM Code safety management system plans, procedures, checklists and instructions 2 vessel's safety, maintenance and emergency procedures

VARIABLE	SCOPE
	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 material safety data sheets 11 tanker manufacturer's instructions and recommended procedures 12 OH&S and pollution prevention procedures relevant to the handling of chemical cargoes 13 instructions of relevant maritime authorities concerning chemical cargo operations 14 relevant Australian and international standards
h Applicable procedures and codes may include:	1 sections of the IMO STCW 95 Convention and Code related to chemical tankers 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 MF Operational Quality and Safety

Relationship to other units

Relationship to other units	The unit may be assessed in conjunction with the unit <i>TDMMA501B Manage procedures for the handling, loading and discharging of chemical cargoes.</i>
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