



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **TDMMF6107A MANAGE MARINE FIREFIGHTING AND PREVENTION ACTIVITIES ON BOARD A VESSEL**

Release: 1

## TDMMF6107A MANAGE MARINE FIREFIGHTING AND PREVENTION ACTIVITIES ON BOARD A VESSEL

### Modification History

Not applicable.

### Unit Descriptor

**UNIT DESCRIPTOR:**

**This unit involves the skills and knowledge required to manage firefighting and fire prevention activities on board a commercial vessel, including managing shipboard firefighting teams, developing and implementing on-board firefighting training exercises, coordinating shipboard tactical firefighting activities, managing the evacuation of personnel from fire and smoke affected compartments, managing fire prevention and suppression activities involving hazardous goods, managing the maintenance of firefighting equipment, supervising the operation of fixed fire suppression systems, liaising with shore-based agencies, and managing fire investigation and reporting activities.**

**This unit incorporates the content of the previous two units *TDMMF1301A Manage marine firefighting and prevention activities* and *TDMMF2001A Prevent, control and fight fires on board a vessel* as the content applied to ocean-going vessels. It aligns with the AMSA approved course: *SC005 - Advanced Firefighting*.**

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### Application of the Unit

<b>Application of the unit</b>	The unit covers requirements for the management of firefighting and prevention activities on ocean-going vessels and has applications in qualifications for masters, engineers and watchkeepers), i.e. Advanced Diploma of Transport&Distribution(Maritime Operations - Master Unlimited), Diploma and of Transport&Distribution(Maritime Operations - Deck Watchkeeper), Advanced Diploma of Transport&Distribution(Marine Engineering Class 1), and Advanced Diploma of Transport&Distribution(Marine Engineering Class 2), Diploma of Transport&Distribution(Marine Engineering - Engineer Watchkeeper).
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## Licensing/Regulatory Information

<b>Licensing/legislative requirements</b>	The unit is consistent with the relevant maritime regulations requirements for the management of firefighting and prevention activities on ocean-going vessels. This includes applicable sections of STCW 95 and AMSA certification and regulatory requirements under Marine Orders Part 3, Seagoing Qualifications, Issue 6.
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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
<p>.</p> <p><b>1 Manage fire prevention procedures</b></p>	<p>.</p> <p>a Fire hazards on board a vessel are identified and action is taken to eliminate or minimise them</p> <p>b Fire prevention equipment and systems are regularly checked and appropriate action is taken to ensure that they are operational</p> <p>c Appropriate educational activities are organised to ensure on-board personnel are aware of the dangers of fire, how to prevent it and what to do if a fire is detected</p> <p>d Personnel on board a vessel are made aware of emergency procedures to be followed in the event of fire</p>

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ELEMENT	PERFORMANCE CRITERIA
<p><b>2 Develop and implement on-board firefighting training exercises</b></p>	<ul style="list-style-type: none"> <li>a On-board firefighting training exercises are developed that are appropriate for the vessel type and are as per established training practice, regulatory requirements and company procedures.</li> <li>b On-board firefighting training arrangements are made to comply with the requirements of maritime regulations</li> <li>c Strategies for effective debriefing of firefighting training exercises are developed and implemented as per established training practice</li> <li>d Firefighting training exercises are evaluated as per established training practice and company procedures</li> <li>e Appropriate improvements are made to firefighting exercises based on feedback provided through debriefings and evaluation findings</li> </ul>
<p><b>3 Manage shipboard firefighting teams</b></p>	<ul style="list-style-type: none"> <li>a The roles/functions of the command and other teams in a shipboard fire situation are established as per regulatory requirements, established marine firefighting practice and company requirements</li> <li>b A checklist for use in firefighting management is developed and implemented as per regulatory requirements and established marine firefighting practice</li> <li>c Information on a shipboard fire situation is obtained and analysed by the command team as per regulatory requirements and established marine firefighting practice</li> <li>d Problems in shipboard fire are identified and appropriate strategies for dealing with tactical firefighting problems are developed as per regulatory requirements and established marine firefighting practice</li> </ul>

ELEMENT	PERFORMANCE CRITERIA
	<p>e A checklist for use in firefighting management is developed and implemented as per regulatory requirements and established marine firefighting practice</p>
<p><b>4 Manage the evacuation of personnel from fire and smoke affected compartments</b></p>	<p>a Evacuation plans are prepared as per the vessel's safety management system, regulatory requirements and established marine firefighting practice</p> <p>b Controlled ventilation is correctly used to keep occupied compartments smoke free</p> <p>c The likely actions of passengers are anticipated and appropriate action is taken to ensure they comply with planned evacuation procedures</p> <p>d Search and rescue operations for missing personnel are planned and implemented as per the vessel's safety management system, regulatory requirements and established marine firefighting practice</p>

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ELEMENT	PERFORMANCE CRITERIA
<p><b>4 Manage the evacuation of personnel from fire and smoke affected compartments (continued)</b></p>	<p>e The handling and treatment of injured personnel is coordinated as per the vessel's safety management system, first aid and regulatory requirements and established marine firefighting practice</p>

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<b>5 Coordinate shipboard tactical firefighting activities</b>	<ul style="list-style-type: none"> <li>a Hazards associated with a shipboard fire are identified and appropriate hazard control strategies developed and implemented as per the vessel's safety management system, regulatory requirements and established marine firefighting practice</li> <li>b Controlled ventilation techniques are correctly applied in fire suppression and rescue applications as per established marine firefighting practice</li> <li>c Tactical plan of action in a shipboard fire situation is determined as per the fire control plan and established marine firefighting practice</li> <li>d Free surface effects that may occur during firefighting operations are identified and appropriate solutions developed to maintain vessel stability as per established marine firefighting practice</li> <li>e Communications with fire teams and with outside stations are managed as per vessel's procedures, regulatory requirements and established firefighting practice</li> </ul>
<b>6 Manage fire prevention and suppression activities involving hazardous goods</b>	<ul style="list-style-type: none"> <li>a The vessel's hazardous goods stowage plan is located and correctly used in firefighting and fire prevention activities.</li> <li>b Appropriate material safety data sheets are obtained and interpreted in the event of a fire involving hazardous materials</li> <li>c Fire prevention precautions in situations involving hazardous materials are correctly applied as per the IMW Code and the vessel's safety management system</li> <li>d Contingency plans for fires involving hazardous materials are prepared as per the IMW Code and the vessel's safety management system</li> <li>e Tactical methods for fighting fires involving hazardous materials are correctly applied as per the IMW Code and the vessel's safety management system</li> <li>f The BC Code is correctly applied in firefighting and fire prevention situations and activities involving hazardous bulk cargoes</li> </ul>

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ELEMENT	PERFORMANCE CRITERIA
<p><b>7 Liaise with shore-based agencies</b></p>	<ul style="list-style-type: none"> <li>a Strategies for shipboard firefighting management in port are developed with the regard to the Navigation Act, local fire regulations and regulations of the relevant port authority</li> <li>b Appropriate liaison is maintained with relevant shore-based firefighting, emergency and port authorities as per regulatory requirements and established firefighting and emergency practices and procedures</li> <li>c Appropriate strategies are developed and implemented for rapid briefing of shore-based firefighters and other shore-based emergency organisations as per regulatory requirements and established marine firefighting practice</li> <li>d Appropriate strategies are developed and used for overcoming language barriers when communicating with shore-based firefighters</li> </ul>
<p><b>8 Manage fire investigation and reporting activities</b></p>	<ul style="list-style-type: none"> <li>a Area affected by fire is correctly secured prior to investigation as per the vessel's safety management system, regulatory requirements and established marine firefighting practice</li> <li>b The cause of a fire is investigated and determined as per established procedures and regulatory requirements</li> <li>c A fire investigation report should be completed as per established procedures and regulatory requirements</li> <li>d Relevant agencies are correctly notified in the event of a shipboard fire as per established procedures and regulatory requirements</li> </ul>

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<b>9 Manage the maintenance of firefighting equipment</b>	<ul style="list-style-type: none"><li>a The routine maintenance of firefighting and suppression equipment is coordinated and supervised as per vessel's procedures, manufacturer's instructions, regulatory requirements and established firefighting practice</li><li>b Arrangements are made for the replenishment, repair or replacement of faulty or depleted firefighting and suppression equipment as per vessel's procedures, manufacturer's instructions, regulatory requirements and established firefighting practice</li><li>c Reports on routine maintenance and repair of firefighting equipment are made as per vessel's procedures and regulatory requirements</li></ul>

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<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
<b>10 Supervise the operation of fixed fire suppression systems</b>	<ul style="list-style-type: none"><li>a The serviceability of fixed fire suppression systems is periodically checked as per vessel's procedures, manufacturer's instructions and regulatory requirements</li><li>b Fixed firefighting systems are correctly activated when required as per vessel's procedures, manufacturer's instructions and regulatory requirements</li></ul>



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## **Required Skills and Knowledge**

### **REQUIRED KNOWLEDGE**

*This describes the knowledge required for this unit.*

- 1 Relevant sections of the relevant maritime regulations applicable to the management of marine firefighting and prevention activities
- 2 Role and function of standard firefighting organisation models used on board vessels, including:
  - a the role/function of the command team in a shipboard fire situation
  - b the roles of other firefighting teams in a shipboard fire
  - c the role and duties of the scene leader in a shipboard fire scenario

## REQUIRED KNOWLEDGE

- 3 The chemistry of fire and its relationship to materials typically carried on vessels
- 4 Principles underlying the spread of fire and its extinguishment
- 5 The different classes of fire, their characteristics and strategies and equipment needed for their extinguishment
- 6 The characteristics and hazards associated with fires on various vessel types and spaces
- 7 Material safety data sheets relevant to the various types of cargo carried on vessels
- 8 The importance of maintenance of fire detection and firefighting equipment on board vessels
- 9 Types of fire detection, firefighting equipment and systems used on board vessels, their features, principles of operation and the procedures for their use and maintenance
- 10 Firefighting techniques applicable to different classes of fire on board a vessel
- 11 Sources for information that available to the command team in a shipboard fire situation
- 12 The implications of shipboard firefighting management in port and procedures that must be followed to comply with port and state regulations
- 13 Problems that are likely to be encountered during the management of a shipboard fire and related tactics and solutions that can be applied
- 14 Relevant regulations, codes of practice, policies and procedures related to the to the maintenance of fire detection, firefighting equipment and systems
- 15 Methods for checking and replacing consumable materials in typical fire detection and firefighting equipment and systems on board various types and sizes of vessels
- 16 The requirements for on-board firefighting training, including:
  - a basic training principles and practice
  - b on board firefighting training requirements as detailed in the AMSA Marine Orders
  - c the importance of having aims and objectives for a training exercise
  - d procedures for evaluating and improving training activities

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- 17 Problems that can occur with fire detection and firefighting equipment and operations on board a vessel and appropriate remedial action and solutions
- 18 The principle of operation of fixed fire suppression systems
- 19 The procedure for the safe activation of fixed firefighting systems
- 20 The typical actions of passengers in a shipboard fire
- 21 Maritime communication techniques applicable to the management of fire prevention and firefighting activities on board a vessel
- 22 Strategies for rapid briefing of shore-based firefighters and other shore-based emergency organisations
- 23 Strategies for overcoming language barriers when communicating with shore-based firefighters
- 24 Sources of information on fire prevention and extinguishment on board vessels

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**REQUIRED SKILLS**

*This describes the basic skills required for this unit.*

- 1 Communicate effectively with crew and passengers during simulated and real fire emergencies
- 2 Read, interpret and follow policy and procedures for the management of fire prevention and firefighting activities on a vessel
- 3 Liaise with shore-based firefighters and other shore-based emergency organisations during a fire emergency on a vessel
- 4 Use appropriate strategies for overcoming language barriers and cultural differences when communicating with shore-based firefighters
- 5 Recognise and interpret fire alarms and respond as per emergency procedures

## REQUIRED SKILLS

- 6 Provide leadership to other shipboard personnel and passengers during a fire emergency
- 7 Determine the type and extent of a fire and initiate appropriate action
- 6 Coordinate the operations of a standard shipboard firefighting organisation on a vessel
- 8 Coordinate the use of fixed fire detection and extinguishing systems as per operating instructions
- 9 Coordinate the use of portable fire extinguishers as per operating instructions
- 10 Recognise problems that can occur with fire detection and firefighting equipment and operations on board a vessel and initiate appropriate remedial action and solutions
- 11 Provide on-board firefighting training for members of a shipboard firefighting organisation on a vessel
- 12 Adapt to contingencies and variations in fire prevention and firefighting equipment on a vessel
- 13 Recognise fire hazards on a vessel and initiate appropriate action to minimise them
- 14 Coordinate the maintenance of fire detection and firefighting equipment on board a vessel

## 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.*

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| <b>1 Critical aspects of evidence required to</b> | Assessment must confirm appropriate knowledge and skills to: <ol style="list-style-type: none"><li>a Manage and implement firefighting and fire prevention</li></ol> |
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<b>demonstrate competency in this unit</b>	<p>measures and procedures on board a vessel</p> <ul style="list-style-type: none"><li>b Coordinate activities to ensure the operational capability of fire detection and firefighting equipment and systems and any required maintenance or replenishment action</li><li>c Manage interior search and rescue and firefighting teams on-board a vessel</li><li>d Manage the evacuation of personnel from fire and smoke affected compartments</li><li>e Manage fire prevention and suppression activities involving hazardous goods</li><li>f Manage the maintenance of firefighting and suppression equipment</li><li>g Liaise with shore-based agencies during a fire emergency</li><li>h Manage fire investigation and reporting activities</li><li>i Coordinate on-board firefighting training</li><li>j Implement OH&amp;S and pollution control principles and regulations when managing fire prevention and firefighting activities</li></ul>
<b>2 Evidence required for demonstration of consistent performance</b>	<ul style="list-style-type: none"><li>a Performance is demonstrated consistently over a period of time and in a suitable range of contexts</li><li>b Consistently applies underpinning knowledge and skills when:<ul style="list-style-type: none"><li>1 managing and implementing firefighting and prevention measures and procedures on-board a commercial vessel</li><li>2 coordinating activities to ensure the operational capability of fire detection and firefighting equipment and systems and any required maintenance or replenishment action</li><li>3 managing interior search and rescue and firefighting teams on-board a vessel</li><li>4 managing the evacuation of personnel from fire and smoke affected compartments</li></ul></li></ul>

- 5 managing fire prevention and suppression activities involving hazardous goods
- 6 managing the maintenance of firefighting and suppression equipment
- 7 liaising with shore-based agencies during a fire emergency

### Evidence Guide (continued)

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

- 8 managing fire investigation and reporting activities
- 9 coordinating on-board firefighting training
- c Shows evidence of application of relevant workplace procedures, including:
  - 1 relevant sections of maritime regulations
  - 2 State/Territory fire regulations and legislation
  - 3 OH&S regulations and hazard prevention policies and procedures
  - 4 pollution control regulations and legislation
  - 5 firefighting and prevention procedures and policies
  - 6 job procedures and work instructions
  - 7 vessel's ISM Code safety management system (where applicable)
  - 8 relevant manufacturer's guidelines relating to the use of fire detection and firefighting equipment and systems, including instructions on equipment capability and limitations
  - 9 following on-board housekeeping processes and fire hazard prevention measures
- d Action is taken promptly to report and/or rectify fire-related incidents as per established procedures

	<ul style="list-style-type: none"> <li>e Work is completed systematically with required attention to detail</li> <li>f Recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions between crew and others</li> </ul>
<p><b>3 Context of assessment</b></p>	<ul style="list-style-type: none"> <li>a Assessment of competency must comply with the assessment requirements of the relevant maritime regulations</li> <li>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"> <li>1 As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations, and</li> <li>2 Appropriate practical assessment must occur:                 <ul style="list-style-type: none"> <li>i at the registered training organisation; and/or</li> <li>ii on an appropriate working or training vessel</li> </ul> </li> </ul> </li> </ul>

**Evidence Guide (continued)**

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<p><b>4 Specific resources required for assessment</b></p>	<p>Access is required to opportunities to:</p> <ul style="list-style-type: none"> <li>a carry out a range of suitably simulated practical and knowledge assessments that demonstrate the skills and knowledge to coordinate firefighting and prevention strategies and manage interior search and rescue and firefighting teams on board vessels; and/or</li> <li>b manage firefighting and prevention strategies and interior search and rescue and firefighting teams in real and simulated fire emergency situations on board an operational vessel</li> </ul> <p>Note: Simulated firefighting assessment exercises may require access to a fire training and assessment facility capable of simulating firefighting activities in a marine</p>
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environment. Assessments must be conducted as per relevant OH&S requirements. Protective clothing must be worn as per current maritime practices and Australian OH&S standards.

## 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

<b>a. Work must be carried out:</b>	1 in compliance with the maritime regulations, tanker safety guides and port regulations related to prevention and fighting of fires on vessels
<b>b. Work is performed:</b>	1 relatively independently under broad operational requirements, with accountability and responsibility for self and leadership to others in achieving the prescribed outcomes
<b>c. Work involves:</b>	1 the application of advanced firefighting principles, techniques and tactics and procedures to the management of firefighting and prevention activities on-board vessel. Contribution to the development of a broad plan for firefighting and prevention operations is required and accountability and responsibility for self and others in achieving the outcomes is involved



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

- d. Work requires:**
- 1 significant judgement in planning, technical and leadership functions related to the fighting and prevention fire on a vessel

## 2. WORKSITE ENVIRONMENT

<b>a Vessel may include:</b>	1 any Australian or international commercial vessel
<b>b Firefighting may need to be carried out:</b>	<ol style="list-style-type: none"> <li>1 by day or night in both normal and emergency situations</li> <li>2 under any possible conditions of weather and loading</li> <li>3 while underway</li> <li>4 during berthing and unberthing operations</li> <li>5 while anchoring or mooring</li> <li>6 while in port</li> <li>7 while moored or at anchor</li> </ol>

### Range Statement (continued)

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VARIABLE	SCOPE
<b>c Firefighting equipment may include:</b>	<ol style="list-style-type: none"> <li>1 portable fire extinguishers, including foam, water, CO<sub>2</sub>, dry chemical, and wet foam</li> <li>2 CO<sub>2</sub> fixed systems</li> <li>3 foam installations, including semi-portable and fixed installations</li> <li>4 sprinkler systems</li> </ol>

VARIABLE	SCOPE
	5 fire pumps, including main and emergency fire pump 6 fire hoses, hydrants, branches and international shore connection
<b>d Fixed fire suppression systems may include:</b>	1 carbon dioxide 2 water spray 3 halon alternatives
<b>e Fixed fire suppression systems may be installed in:</b>	1 cargo holds 2 machinery spaces
<b>f Personal protection clothing and equipment may include:</b>	1 masks and goggles 2 breathing apparatus and resuscitation equipment 3 protective clothing, including headgear, gloves and footwear 4 escape and rescue equipment
<b>g Hazards when fighting fires may include:</b>	1 burns 2 smoke 3 explosion 4 poisonous fumes and gas 5 instability caused by the free surface effect 6 environmental hazards to air and water 7 reactivity hazards, including effects of self-reaction, temperature and effects of air, water, impurities and other chemicals and reagents

VARIABLE	SCOPE
	8 toxic fluids, vapours and gases, involving skin contact, ingestion and inhalation
	9 corrosion hazards to personnel, vessel structures and equipment
	10 working in confined spaces

**Range Statement (continued)**

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VARIABLE	SCOPE
<b>h Documentation and records may include:</b>	1 relevant maritime regulations
	2 safety management system documentation
	3 vessel's log
	4 fire detection, firefighting and safety equipment operational and maintenance instructions and recommended procedures
	5 instructions of relevant maritime authorities related to fire detection, firefighting and safety equipment and systems
	6 relevant Australian and international standards
<b>i Applicable legislation, regulations and codes may include:</b>	1 IMO STCW 95 and relevant sections of AMSA Marine Orders
	2 State and Territory Fire legislation
	6 relevant Commonwealth, State and Territory OH&S and pollution control legislation
	7 regulations of port authorities and related shore-based emergency authorities

## Unit Sector(s)

Not applicable.

## Field

Field MF Operational quality and safety

## Relationship to other units

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