



**Australian Government**

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

# **TDMMB4607A APPLY INFORMATION ON VESSEL STRUCTURE TO MAINTENANCE AND SEAWORTHINESS**

**Release: 1**

## TDMMB4607A APPLY INFORMATION ON VESSEL STRUCTURE TO MAINTENANCE AND SEAWORTHINESS

### Modification History

Not applicable.

### Unit Descriptor

UNIT DESCRIPTOR:

**This unit involves the skills and knowledge required of a Watchkeeper (Deck) to apply information on vessel structure to the maintenance and seaworthiness of a commercial vessel.**

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### Application of the Unit

<b>Application of the unit</b>	The unit has application in the qualifications for a Watchkeeper (Deck) and Master (Less than 500 GT), i.e. Diploma of Transport&Distribution(Maritime Operations - Deck Watchkeeper).
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### Licensing/Regulatory Information

<b>Licensing/legislative requirements</b>	The unit is consistent with the relevant sections of STCW 95 and Marine Orders under the Australian Navigation Act 1912, describing the role and responsibilities of a Watchkeeper (Deck).
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### Pre-Requisites

Not applicable.

### Employability Skills Information

Not applicable.

## Elements and Performance Criteria Pre-Content

*Elements describe the essential outcomes of a unit of competency.*

*Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.*

## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<p><b>1 Check the seaworthiness of the vessel</b></p>	<ul style="list-style-type: none"> <li>a Checks of the seaworthiness of vessel are planned and carried out as per company procedures and established safety rules and regulations</li> <li>b Coverage and frequency of checks and inspections of the vessel's seaworthiness complies with company procedures, established safety management system and relevant maritime regulations</li> <li>c Degree of vessel security is commensurate with anticipated weather and sea conditions and necessary vessel operations</li> <li>d Action taken in anticipation of environmental changes is timely and appropriate to the change</li> <li>e Precautions are taken to ensure that vessel and on-board powered equipment is operated as per manufacturer's instructions and safe working practice</li> <li>f Action taken in emergency situations is appropriate to the significance of the situation and designed to maximise watertight integrity</li> <li>g Instructions to other personnel on the vessel are clear, concise and made at an appropriate time and place</li> </ul>
<p><b>2 Coordinate maintenance inspections of the vessel</b></p>	<ul style="list-style-type: none"> <li>a Maintenance inspections of the vessel are carried out in accordance with standard operating procedures and the vessel's planned maintenance system</li> <li>b Repairs and corrosion control are initiated and coordinated in</li> </ul>

**ELEMENT**

**PERFORMANCE CRITERIA**

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accordance with company procedures and vessel and equipment manufacturer's instructions

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**ELEMENT**

**PERFORMANCE CRITERIA**

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ELEMENT	PERFORMANCE CRITERIA
<b>3 Maintain records of maintenance activities and checks of seaworthiness</b>	a Records of the seaworthiness of a vessel and actions taken to carry out repairs and corrosion control are complete, accurate and comply with statutory, commercial and enterprise requirements

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## Required Skills and Knowledge

### REQUIRED KNOWLEDGE

*This describes the knowledge required for this unit.*

- 1 Applicable sections of the IMO STCW 95 Code and AMSA Marine Orders dealing with the seaworthiness of and maintenance of vessels of 500 gross tonnage or more
- 2 ISM Code and associated vessel's safety management system and procedures
- 3 Relevant OH&S and pollution control legislation and policies
- 4 Principal features of the structure of a vessel of 500 gross tonnage or more
- 5 A basic understanding of the properties and application of materials used in construction of vessels of 500 gross tonnage or more
- 6 Construction, layout and subdivision requirements of a typical vessel of 500 gross tonnage or more, including an understanding of freeboard and bulkhead deck, watertight compartments, weathertight compartments, the bulkhead of the vessel and collision bulkhead
- 7 Typical construction features and stress characteristics for vessels of 500 gross tonnage or more
- 8 The principal stresses which act on the structure of a vessel of 500 gross tonnage or more
- 9 Procedures for the checking and inspecting a vessel's seaworthiness to ensure compliance with company procedures and established safety rules and regulations (within the limits of responsibility of a Watchkeeper (Deck))

## **REQUIRED KNOWLEDGE**

- 10 Principles and procedures to ensure the watertight integrity of a vessel's hull in both normal and emergency situations
- 11 Damage control measures that may be required to maintain the integrity of the hull in a range of typical emergency situations that could occur on a vessel
- 12 Planned maintenance systems for vessels and associated maintenance inspection procedures
- 13 Procedures for the initiation and coordination of repair and/or replacement processes within the limits of responsibility of a Watchkeeper (Deck)
- 14 Corrosion control measures, including surface preparation and painting and antifouling
- 15 Safety, environmental and hazard control precautions and procedures relevant to inspection and maintenance operations
- 18 Maritime communication techniques needed
- 19 Problems related to the maintenance and seaworthiness of a vessel and appropriate action and solutions within the limits of responsibility of a Watchkeeper (Deck)
- 20 Records that must be maintained on the planned maintenance activities and seaworthiness of a vessel

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## **REQUIRED SKILLS**

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

- 1 Communicate effectively with other personnel when coordinating planned maintenance processes and the seaworthiness of the vessel within the limits of responsibility of a Watchkeeper (Deck)
- 2 Communicate with multilingual crew where applicable using established techniques
- 3 Interpret and follow procedures for the coordination of planned maintenance processes and the seaworthiness of the vessel

## REQUIRED SKILLS

- 4 Read and interpret vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications and electrical and control circuit diagrams
- 5 Interpret and follow all safety management procedures and precautions when coordinating planned maintenance processes and the seaworthiness of the vessel
- 6 Read and interpret material safety data sheets
- 7 Work collaboratively with other shipboard personnel when coordinating planned maintenance processes and the seaworthiness of the vessel
- 8 Prepare appropriate reports on the outcomes of inspection and maintenance activities to ensure the seaworthiness of the vessel
- 9 Identify problems that can occur coordinating planned maintenance processes and the seaworthiness of the vessel and take appropriate action within the limits of responsibility of a Watchkeeper (Deck)
- 10 Carry out any calculations required when coordinating planned maintenance processes and the seaworthiness of the vessel
- 11 Adapt to differing types of vessels, equipment and related standard operating procedures
- 12 Take appropriate precautions to prevent pollution of the marine environment
- 13 Select and use materials, tools and other equipment required when coordinating planned maintenance processes and the seaworthiness of the 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.*

<b>1 Critical aspects of evidence</b>	Assessment must confirm appropriate knowledge and skills to:
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<p><b>required to demonstrate competency in this unit</b></p>	<ul style="list-style-type: none"> <li>a Monitor and evaluate the seaworthiness of the vessel under normal and emergency situations</li> <li>b Initiate and coordinate maintenance required to ensure the seaworthiness of a vessel</li> <li>c Identify typical problems related to the maintenance and seaworthiness of a vessel and take appropriate action in conjunction with other shipboard personnel</li> <li>d Exercise all required safety, environmental and hazard control precautions and procedures during inspection and maintenance operations</li> <li>e Communicate effectively with others when taking action to maintain the seaworthiness of the vessel</li> </ul>
<p><b>2 Evidence required for demonstration of consistent performance</b></p>	<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 carrying out routine and emergency checks and inspections of a vessel's seaworthiness</li> <li>2 identifying and evaluating problems concerning the maintenance and seaworthiness of a vessel and determining appropriate courses of action</li> <li>3 initiating and coordinating maintenance activities required to ensure the seaworthiness of a vessel</li> <li>4 applying safety precautions relevant to maintenance operations</li> <li>5 identifying and implementing improvements to procedures for maintaining the seaworthiness of a vessel</li> </ul> </li> <li>c Shows evidence of application of relevant workplace procedures, including:             <ul style="list-style-type: none"> <li>1 relevant sections of IMO Conventions and AMSA Marine Orders</li> <li>2 OH&amp;S regulations and hazard prevention policies and procedures</li> </ul> </li> </ul>



- 3 standard operating procedures and work instructions
- 4 relevant vessel manufacturer's guidelines relating to the maintenance requirements and seaworthiness of the vessel

**Evidence Guide (continued)**

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<b>2 Evidence required for demonstration of consistent performance (continued)</b>	<ul style="list-style-type: none"> <li>d Action is taken promptly to report and/or rectify problems with the seaworthiness of the vessel as per regulations, procedures and manufacturer's instructions,</li> <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>
<b>3 Context of assessment</b>	<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>
<b>4 Specific resources required for assessment</b>	<p>Access is required to opportunities to:</p> <ul style="list-style-type: none"> <li>a participate in a range of exercises, case studies and other simulated practical and knowledge assessments that demonstrate the skills and knowledge to maintain the</li> </ul>

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|   | seaworthiness of a vessel in a range of operational situations; and/or  |
| b | assist in maintaining the seaworthiness of a vessel in a range of operational situations either: <ul style="list-style-type: none"> <li>i using a simulator, meeting the requirements of Section A I/12 of the IMO STCW 95 Code, over an appropriate range of simulated loading and operational situations</li> <li>ii in appropriate practical situations on an operational commercial or training vessel</li> </ul> |

## Range Statement

### Range Statement

**TDMMB4607A APPLY INFORMATION ON VESSEL STRUCTURE TO MAINTENANCE AND SEAWORTHINESS**

*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 relevant sections of the AMSA Marine Orders and IMO STCW Conventions and Codes
<b>b. Work is performed:</b>	1 relatively independently within broad operational requirements, with limited 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.*

<b>c. Work involves:</b>	1 the application of vessel construction principles to the coordination of the planned maintenance processes and the seaworthiness of a vessel across a wide and often unpredictable variety of operational contexts. Monitoring and coordinating the implementation of a maintenance plan and a strategy for maintaining the ongoing seaworthiness of a vessel is required
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<b>VARIABLE</b>	<b>SCOPE</b>
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<b>d. Work requires:</b>	1 responsibility in the management of the maintenance of the seaworthiness of a vessel
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**2. WORKSITE ENVIRONMENT**

<b>a Vessel may include:</b>	1 any Australian or international commercial vessel
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<b>b Seaworthiness of a vessel must be maintained:</b>	<ul 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 sea, 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 when bunkering</li> <li>7 when berthed, anchored or moored</li> <li>8 when loading/unloading cargo</li> </ul>
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**Range Statement (continued)**

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<b>VARIABLE</b>	<b>SCOPE</b>
<b>c Action taken to check the seaworthiness of a vessel may include:</b>	<ol style="list-style-type: none"> <li>1 routine inspections</li> <li>2 checks prior to departure</li> <li>3 checks on completion of a voyage</li> <li>4 checks on completion of maintenance activities</li> <li>5 checks in anticipation of a change in sea and weather conditions</li> <li>6 checks during an emergency which may have caused damage to the vessel</li> </ol>
<b>e Planned maintenance activities may include:</b>	<ol style="list-style-type: none"> <li>1 repairs to equipment, components and vessel's structure and appliances</li> <li>2 surface preparation and painting</li> <li>3 antifouling</li> <li>4 lubrication</li> <li>5 replacement of faulty equipment or components</li> </ol>
<b>g Documentation /records may include</b>	<ol style="list-style-type: none"> <li>1 safety management system plans, procedures, checklists and instructions</li> <li>2 operational orders and company procedures</li> <li>3 applicable maritime regulations</li> <li>4 planned maintenance system and associated records</li> <li>5 vessel and equipment manufacturer's instructions,</li> </ol>

VARIABLE	SCOPE
	<p>specifications and recommended procedures</p> <p>6 applicable notices and instructions of relevant maritime authorities</p> <p>7 relevant Australian and international standards</p>
<b>h Applicable procedures and codes may include</b>	<p>1 IMO Conventions related to the seaworthiness of vessels</p> <p>2 ISM Code</p> <p>3 relevant sections of AMSA Marine Orders related to the maintenance and seaworthiness of vessels</p> <p>4 relevant international, Commonwealth, State and Territory OH&amp;S legislation</p>

### Unit Sector(s)

Not applicable.

### Field

Field B Equipment Checking and Maintenance

### 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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