



Australian Government

MARL5011A Demonstrate basic knowledge of ships and ship routines

Release 1

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Modification History

Release 1

This is the first release of this unit.

Unit Descriptor

This unit involves the skills and knowledge required to maintain a safe engineering watch on a commercial vessel.

Application of the Unit

This unit applies to the work of Marine Engineering Watchkeepers on commercial vessels greater than 750 kW forms part of the requirements for the Certificate of Competency Marine Engineer Watchkeeper issued by the Australian Maritime Safety Authority (AMSA).

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

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

1 Outline key features of different types of commercial ships	1.1	Annotated sketch of profile and midship section of a range of ship types is constructed
	1.2	Terms used to quote size of a ship are used appropriately
	1.3	Plate materials and joining methods used in ship construction are detailed
	1.4	Basic principles of watertight integrity are identified and applied
	1.5	Shipping terms are applied to describe characteristics of commercial vessels
2 Explain dangers associated with entry into engine room spaces	2.1	How atmosphere in engine room spaces may be hazardous is detailed
	2.2	Procedures for obtaining permission to enter engine room spaces are outlined
	2.3	Administrative procedures applying to work in engine room after normal hours are outlined
3 Explain need for standards and other monitoring requirements for ships	3.1	International standards relating to construction, equipment and conditions of commercial vessels are outlined
	3.2	National legislation and IMO conventions concerning safety of life at sea, security and protection of marine environment are outlined
	3.3	Requirements of ISM Code and safety management system are outlined
	3.4	Qualifications and experience requirements for key personnel on a ship are outlined
	3.5	Personal and ship certificates, and other documents required to be carried on board ship by international conventions, how they are obtained, how they may be verified and period of their legal validity are identified
	3.6	Roles and functions of key national and international shipping authorities and organisations are outlined
	3.7	Purpose of surveys and dry-docking of ships are explained
4 Explain responsibilities of personnel on	4.1	Roles and responsibilities of personnel on board ship are clarified
	4.2	Organisational structure, lines of responsibility and communication on board ship are outlined

board ship	4.3	International maritime conventions, recommendations and national legislation concerning shipboard personnel and training are clarified
	4.4	Daily work and shipboard routines relating to engineering watchkeeping are outlined
	4.5	Personal and social responsibilities of personnel on board ship are confirmed
5 Explain engineering watchkeeping procedures	5.1	Established marine engineering practice and regulatory requirements for conduct, handover and relief of an engineering watch are outlined
	5.2	Operational procedures and requirements for main propulsion, auxiliary systems and associated controls are outlined
	5.3	Operational procedures and requirements for monitoring the performance of main propulsion, auxiliary systems and associated controls are outlined
	5.4	Procedures for identifying, rectifying and reporting problems associated with performance of main propulsion, auxiliary systems and associated controls are outlined
	5.5	Basic operation, monitoring and maintenance of shafting installations and propeller systems is detailed
	5.6	Engine room resource management principles and procedures required for a safe engineering watch are outlined
	5.7	Safety precautions to be observed during a watch and immediate action to be taken in the event of fire or accident are clarified
	5.8	Requirements for recording activities and incidents that occur during keeping an engineering watch are detailed
	5.9	Fatigue management strategies for engine room management team are identified
	5.10	Personal task and workload management techniques appropriate for an engineering watchkeeper are outlined
6 Outline procedures and responses to malfunctions and emergency	6.1	Potential malfunctions and emergencies relating to main propulsion and auxiliary systems are identified
	6.2	Correct response and required action relating to potential malfunctions and emergencies in main propulsion and auxiliary systems are detailed

situations

- 6.3 Regulatory requirements and reporting requirements for incidents and emergency situations outside watchkeeper limits of responsibility are confirmed

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required Skills:

- Access information required to undertake watchkeeping duties in routine and emergency situations
- Assess own work outcomes and maintain knowledge of current codes, standards, regulations and industry practices
- Identify and determine appropriate ways of responding to malfunctions and emergency situations in daily watchkeeping operations
- Identify, interpret and process numerical and graphical information required to undertake watchkeeping duties in routine and emergency situations
- Identify methods and procedures needed to implement watchkeeping duties on commercial vessels
- Read and interpret written instructions, procedures and information relevant to watchkeeping duties

Required Knowledge:

- Bridge instrumentation, controls and alarms
- Bridge resource management systems
- Causes of groundings, collisions and casualties
- Composition of bridge/engine room management team
- Enclosed spaces
- Engineering watchkeeping procedures and practices
- Fatigue management principles and techniques
- Functions of unmanned machinery space (UMS) controls, alarms and indicators
- Hierarchy and organisational structure of shipboard personnel
- Key international and Australian standards relating to shipping
- Key shipping authorities and organisations
- Maritime communication techniques
- Navigational hazards and implications for watchkeeping
- Personal and social responsibilities on board ship
- Procedures for dealing with malfunctions and emergencies
- Rudder and propeller control and vessel manoeuvring characteristics
- Sections of IMO STCW Convention and Codes and AMSA Marine Orders dealing with watchkeeping principles, arrangements, procedures, roles and responsibilities
- Signs of fatigue
- Types of ships and key features of ships

- Watch handover procedures
- Work health and safety (WHS)/occupational health and safety (OHS) legislation and policies

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, the required skills and knowledge, the range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the Elements, Performance Criteria, Required Skills, Required Knowledge and include:

- providing accurate and reliable information
- providing appropriate level of detail in responses.

Context of and specific resources for assessment

Performance is demonstrated consistently over time and in a suitable range of contexts.

Resources for assessment include access to:

- industry-approved marine operations site where basic knowledge of ships and ship routines can be demonstrated
- technical reference library with current publications on commercial shipping
- tools, equipment and personal protective equipment currently used in industry
- relevant regulatory and equipment documentation that impacts on work activities
- range of relevant exercises, case studies and/or other simulated practical and knowledge assessments
- appropriate range of relevant operational situations in the workplace.

In both real and simulated environments, access is required to:

- relevant and appropriate materials and equipment
- applicable documentation including workplace procedures, regulations, codes of practice and operation manuals.

Method of assessment

Practical assessment must occur in an:

- appropriately simulated workplace environment and/or
- appropriate range of situations in the workplace.

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are

appropriate to this unit:

- direct observation of the candidate demonstrating basic knowledge of ships and ship routines
- direct observation of the candidate applying relevant WHS/OHS requirements and work practices.

Guidance information for assessment

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

In all cases where practical assessment is used it should be combined with targeted questioning to assess Required Knowledge.

Assessment processes and techniques must be appropriate to the language and literacy requirements of the work being performed and the capacity of the candidate.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below.

Ship types may include:

- Bulk carrier
- Container
- General dry cargo
- Passenger
- Ro-ro
- Tanker

Shipping terms may include:

- Hogging
- Panting
- Pounding
- Racking
- Sagging

Key personnel may include:

- Crew
- Master
- Officers

Shipping organisations and authorities may include:

- Australian Maritime Safety Authority
- Classification societies
- International Maritime Organisation
- National Maritime Safety Committee
- State and territory marine authorities

Personal and social responsibilities may include:

- Alcohol and drug abuse
- Discipline
- Finance
- Health and fitness
- Hygiene
- Relationships
- Safety

Engine room resource management principles may include:

- Allocation, assignment and prioritisation of resources
- Assertiveness and leadership
- Considering team experience
- Effective communication
- Obtaining and maintaining situational awareness

Personal task and workload management techniques may include:

- Coordination
- Managing resource constraints
- Managing time constraints
- Personnel assignment

Potential malfunctions and emergencies may include:

- Planning
- Accidents
- Breakdowns
- Collisions
- Explosion fire
- Flooding
- Groundings

Unit Sector(s)

Not applicable.

Competency Field

Marine Engineering