



Australian Government

MARC026 Operate remote controls of propulsion plant and engineering systems

Release: 1

MARC026 Operate remote controls of propulsion plant and engineering systems

Modification History

Release 1. This is the first release of this unit of competency in the MAR Maritime Training Package Release 3.0.

Application

This unit involves the skills and knowledge required to remotely operate shipboard plant, propulsion systems, auxiliary machinery and equipment according to technical specifications and within safe operating limits at all times.

This unit applies to individuals working in the maritime industry as a Master on vessels up to 3000 gross tonnes.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Not applicable.

Competency Field

C – Equipment operation

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Operate remote controls

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 Remote controls of propulsion plant, other engineering systems and auxiliary machinery are operated according to company procedures and manufacturer instructions

1.2 Clear and concise communication is used with engine room and communication is acknowledged according to established procedures

- 1.3 Performance of propulsion plant, other engineering systems and auxiliary machinery and equipment is monitored and evaluated using remote performance indicators
- 1.4 Appropriate corrective action is taken in conjunction with the Chief Engineer when performance of propulsion plant or other engineering systems is found to be unsatisfactory or outside of specified limits
- 1.5 Relationship between speed and fuel consumption is monitored and action is taken as required according to operational instructions
- 1.6 Safety and hazard minimisation procedures and regulations are followed to maintain the safety of personnel, propulsion and engineering systems, cargo and vessel
- 2 Coordinate deck and engine room resources**
 - 2.1 Coordination of deck and engine room operations and resources is maintained during daily vessel operation
 - 2.2 Responses are coordinated and appropriate action is taken in a breakdown in the remote control systems for propulsion plant, other engineering systems and auxiliary machinery
 - 2.3 Correct logbook entries are made relating to equipment operations and incidents during a voyage
- 3 Manage emergencies involving the use of remote controls**
 - 3.1 Remote controls of relevant emergency systems and auxiliary machinery and equipment are correctly operated in a shipboard emergency
 - 3.2 Clear and concise communication is used and communication is acknowledged at all times during emergency situations

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Propulsion plant and engineering systems include one or more of the following:

- auxiliary systems and controls
- bridge controls and UMS (unmanned machinery spaces) systems
- electrical systems and controls
- engineering plant performance indicators
- hydraulic systems and controls
- indicators of speed and fuel consumption
- propulsion systems and controls
- pumps and pumping systems
- steering gear
- fire or explosion in engine room
- flooding of engine room
- loss of electrical power
- loss of propulsion
- loss of steering

Emergencies include one or more of the following:

Unit Mapping Information

This unit replaces and is equivalent to TDMMC207B Operate remote controls of propulsion plant and engineering systems.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

Assessment Requirements for MARC026 Operate remote controls of propulsion plant and engineering systems

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least one occasion and include:

- adapting to differences in vessels, propulsion plant, remote controls, engineering systems and related standard operating procedures
- applying required safety and hazard control procedures when operating vessel remote controls
- assessing operational capability and performance of propulsion and other engineering plant and auxiliary equipment
- communicating effectively and working collaboratively with other personnel when operating propulsion plant and engineering system remote controls
- identifying and evaluating problems that can occur when operating propulsion plant and engineering system remote controls
- identifying and implementing improvements to engineering control procedures
- interpreting and following standard operating procedures for operating propulsion plant and engineering system remote controls
- interpreting equipment performance readings and instrumentation
- interpreting vessel and machinery specifications, machinery design drawings, machine drawings, operational manuals, specifications, and electrical and control circuit diagrams
- monitoring and evaluating performance of vessel propulsion plant, other engineering systems, and auxiliary machinery and equipment using remote performance indicators
- selecting and using equipment required for operating propulsion plant and engineering system remote controls safely:
 - in normal and emergency situations
 - in normal and adverse weather conditions
 - in berthing and unberthing operations
 - when anchoring or mooring.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- auxiliary systems and controls:
 - air starting
 - ballast water
 - bilge
 - cooling water
 - fuel
 - lubrication
 - waste management and pollution control systems
- basic principles of operation and functions of various systems and controls, including:
 - pumps and pumping systems
 - various shipboard emergency systems
 - hydraulic systems and controls
 - bridge located engine controls
 - various auxiliary systems and controls such as cooling water, fuel system, air starting, lubrication system, ballast water and bilge system
- bridge communications techniques, including issuing of engine room orders
- dangers associated with shipboard electrical plants and related hazard prevention strategies
- documentation and records such as:
 - Australian Maritime Safety Authority (AMSA) Marine Orders
 - company procedures for the remote control of propulsion plant and other engineering systems
 - instructions of relevant maritime authorities
 - International Maritime Organization (IMO) Standards of Training, Certification & Watchkeeping (STCW) Convention and Code
 - International Safety Management (ISM) Code safety management system plans, procedures, checklists and instructions
 - operational orders
 - plant and equipment manufacturer instructions and recommended procedures
 - relevant Australian and international standards
 - vessel log
- methods for remotely controlling the operation of shipboard propulsion plant and other engineering systems, including auxiliary machinery and equipment
- procedures for monitoring and evaluating the performance of propulsion plant, other engineering systems and auxiliary machinery and equipment
- procedures and precautions for bunkering operations

- procedures for coordinating deck and engineering resources
- propulsion plant configurations:
 - controllable pitch propellers (CPP)
 - direct drive shaft
 - electric diesel
 - reduction gear
 - steam
- relevant sections of applicable maritime regulations
- relationship between vessel speed and fuel consumption, including the meaning of economical revolutions per minute (RPM) and its application
- relevant sections of applicable maritime regulations
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation, policies and procedures
- requirements for waste management and control systems under the International Convention for the Prevention of Pollution from Ships (MARPOL Convention)
- typical characteristics of propulsion machinery and control systems for vessels of 500 gross tonnage or more, including operational limits, fuel consumption/speed relationships, stopping distances and turning circles at various draughts, speeds and loading
- typical problems with the remote control of propulsion plant, other engineering systems and auxiliary machinery and equipment, and appropriate preventative and remedial action and solutions
- vessel safety management system and procedures.

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations, current at the time of assessment.

As a minimum, assessment must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations, current at the time of assessment.

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

Assessment must occur in workplace operational situations or where this is not available, in simulated workplace operational situations or an industry-approved marine operations site where the remote operation of propulsion plant and engineering systems can be demonstrated.

Resources for assessment must include access to:

- an Australian or international commercial vessel of 500 gross tonnage or more or an integrated vessel simulator, meeting the requirements of Section A I/12 of the IMO STCW

- company procedures for the remote control of propulsion plant and other engineering systems
- ISM Code safety management system plans, procedures, checklists and instructions
- MARPOL Convention on waste management and control systems
- relevant sections of IMO STCW Convention and Code
- relevant sections of AMSA Marine Orders
- relevant international, commonwealth, state/territory WHS/OHS legislation
- tools, plant and equipment required to remotely operate propulsion plant and engineering systems.
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