



Australian Government

MARC055 Operate remote controls of propulsion plant, engineering systems and services

Release: 1

MARC055 Operate remote controls of propulsion plant, engineering systems and services

Modification History

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

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 people working in the maritime industry in the capacity of:

- Master of a commercial vessel Unlimited.

Licensing/Regulatory Information

Legislative and regulatory requirements are applicable to this unit.

- This unit is one of the requirements to obtain Australian Maritime Safety Authority (AMSA) certification as a Master Unlimited and to meet regulatory requirements this unit must be delivered consistent with Marine Orders and with the relevant sections of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).
- Those regulatory requirements include STCW International Maritime Organization (IMO) model course competencies and areas of knowledge, understanding and proficiency, together with the estimated total hours required for lectures and practical exercises. Teaching staff should note that timings are suggestions only and should be adapted to suit individual groups of trainees depending on their experience, ability, equipment and staff available for training.

Pre-requisite Unit

Not applicable.

Competency Field

C – Equipment operation

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.

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

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| <p>1 Operate remote controls</p> | <p>1.1 Remote controls of propulsion plant, other engineering systems and auxiliary machinery are operated according to company procedures and manufacturer instructions</p> <p>1.2 Clear and concise communication is used with engine room and communication is acknowledged according to established procedures</p> <p>1.3 Performance of propulsion plant, other engineering systems and auxiliary machinery and equipment is monitored and evaluated using remote performance indicators</p> <p>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</p> <p>1.5 Relationship between speed and fuel consumption is monitored and action is taken, as required, according to operational instructions</p> <p>1.6 Safety and hazard minimisation procedures and regulations are followed to maintain the safety of personnel, propulsion and engineering systems, cargo and vessel</p> |
| <p>2 Coordinate deck, bridge and engine room resources</p> | <p>2.1 Coordination of deck, bridge and engine room operations and resources is maintained during daily vessel operation</p> <p>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</p> <p>2.3 Correct logbook entries are made relating to equipment operations and incidents during a voyage</p> |
| <p>3 Manage emergencies involving the use of remote controls</p> | <p>3.1 Remote controls of relevant emergency systems and auxiliary machinery and equipment are correctly operated in a shipboard emergency</p> |

- 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.

Unit Mapping Information

This unit replaces and is equivalent to MARC026 Operate remote controls of propulsion plant and engineering systems.

Links

Companion Volume implementation guide can be found in VetNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

Assessment Requirements for MARC055 Operate remote controls of propulsion plant, engineering systems and services

Modification History

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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 and performance criteria on at least one occasion and include:

- adapting to differences in vessels, propulsion plant, remote controls, engineering systems and related standard operating procedures (SOPs)
- 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 SOPs 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, including:
 - in berthing and unberthing operations
 - in normal and adverse weather conditions
 - in normal and emergency situations
 - 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 and performance criteria and include knowledge of:

- auxiliary systems and controls, including:

- air starting
- ballast water
- bilge
- cooling water
- fuel
- lubrication
- waste management and pollution control systems
- bridge communications techniques, including issuing of engine room orders
- dangers associated with shipboard electrical plants and related hazard prevention strategies
- documentation and records, including:
 - 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) and International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) conventions and codes
 - International Safety Management (ISM) Code, safety management system (SMS) plans, procedures, checklists and instructions
 - operational orders
 - plant and equipment manufacturer instructions and recommended procedures
 - relevant Australian and international standards
 - vessel log
- emergencies situations, including
 - fire or explosion in engine room
 - flooding of engine room
 - loss of electrical power
 - loss of propulsion
 - loss of steering
- methods for remotely controlling the operation of shipboard propulsion plant and other engineering systems, including auxiliary machinery and equipment
- operating principles of marine power plants, including:
 - diesel engines
 - gas turbine systems
 - propeller
 - propeller shaft
 - steam turbine systems
- principles of operation and functions of various systems and controls, including:
 - bridge located engine controls
 - hydraulic systems and controls
 - pumps and pumping systems

- various auxiliary systems and controls, such as cooling water, fuel system, air starting, lubrication system, ballast water and bilge system
- various shipboard emergency systems
- procedures and precautions for bunkering operations
- procedures and arrangements for establishing appropriate and effective engineering watches, including:
 - cargo operations
 - normal safety conditions
 - unmanned machinery space (UMS) operations
- procedures for coordinating deck and engineering resources
- procedures for monitoring and evaluating the performance of propulsion plant, other engineering systems and auxiliary machinery and equipment
- propulsion plant configurations, including:
 - controllable pitch propellers (CPP)
 - direct drive shaft
 - electric diesel
 - reduction gear
 - steam
- relationship between vessel speed and fuel consumption, including the meaning of economical revolutions per minute (r.p.m.) 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)
- ships auxiliary machinery, including:
 - air conditioning
 - alternators
 - deck machinery
 - distillation
 - electrical distribution
 - freshwater systems
 - generators
 - oily water separators
 - refrigeration
 - sewage treatment plants
 - stabilisers
 - ventilation
- typical characteristics of propulsion machinery and control systems for vessels of 500 gross tonnage (GT) 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 actions and solutions

- vessel SMS and procedures.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within 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.

Practical assessment must occur in a workplace or realistic simulated workplace, under the normal range of workplace conditions.

Simulations and scenarios may be used where situations cannot be provided in the workplace or may occur only rarely, in particular for situations relating to emergency procedures and adverse weather conditions where assessment would be unsafe, impractical or may lead to environmental damage.

Resources for assessment must include access to:

- applicable documentation, such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- tools, equipment, machinery, materials and relevant personal protective equipment (PPE) currently used in industry.

Links

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