



Australian Government

MARC011 Manage a propulsion unit using appropriate engine systems and support services

Release: 2

MARC011 Manage a propulsion unit using appropriate engine systems and support services

Modification History

Release 2. Range of Conditions updated to include relevant information.

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate a propulsion unit using appropriate engine systems and support services according to technical specifications and safe operating limits.

This unit applies to people working in the maritime industry on a range of vessels up to 80 metres.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

C – Equipment Operations

Unit Sector

Not applicable.

Elements and Performance Criteria

Elements describe the essential outcomes.

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

1 Prepare for operation

- 1.1 Routine pre-operational checks of propulsion unit, engine systems and support services are completed prior to use according to manufacturer specifications and organisational procedures
- 1.2 Propulsion unit, engine systems and support services are calibrated or set up correctly
- 1.3 Faults or malfunctions are identified and reported according to organisational procedures

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| | 1.4 | Work health and safety (WHS)/occupational health and safety (OHS) hazards in the work area are identified and risk is assessed and reported according to organisational procedures |
| 2 Operate propulsion unit, engine systems and support services | 2.1 | Risks to self, others and the environment are identified according to organisational procedures |
| | 2.2 | Suitable personal protective equipment is selected and used according to organisational procedures |
| | 2.3 | Controls of propulsion unit, engine systems and support services are operated in a safe and controlled manner |
| | 2.4 | Performance and efficiency of propulsion unit, engine systems and support services operations is monitored |
| | 2.5 | Safe operational practices are used to anticipate and control hazards |
| | 2.6 | Adverse sea and weather conditions that may impact on operation of propulsion unit, engine systems and support services are identified and operational practices are adjusted to maintain safety of vessel and personnel |
| | 2.7 | Procedures to be undertaken in the event of emergencies are recognised and implemented |
| 3 Complete operations and check propulsion unit, engine systems and support services | 3.1 | Shut-down procedures are conducted according to manufacturer instructions and organisational procedures |
| | 3.2 | Malfunctions, faults, irregular performance or damage to propulsion unit, engine systems and support services are reported according to organisational procedures |
| | 3.3 | Propulsion unit, engine systems and support services are cleaned and secured according to organisational procedures |
| | 3.4 | Operational records are completed according to organisational procedures |

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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

competency.

Range of Conditions

Specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

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

Propulsion unit and engine systems must include:

- ancillary systems and controls
- bow and stern thrusters units
- controllable pitch propellers (CPP)
- diesel engines
- engine systems and controls
- gearing systems
- hydraulic systems and controls
- performance indicators
- power generating units and controls
- propeller shafting arrangements
- pumps and pumping systems
- safety alarm systems
- speed and fuel consumption indicators
- steering gear

Support services include one or more of the following:

- air conditioning systems
- air starting systems
- bilge systems
- cooling water systems
- fire detection and suppression systems
- fuel pumps, lines and tanks
- lubrication systems
- refrigeration systems
- steering gear systems
- waste management and pollution control systems
- water pumping systems

Emergencies must include:

- fire or explosion
- flooding

- loss of:
 - propulsion
 - electrical power
 - steering

Operational records must include:

- instructions of relevant maritime authorities
- log books
- operational orders from the organisation's safety management system
- plant and equipment manufacturer instructions and recommended procedures
- relevant sections of state and territory maritime regulations, National Standard for Commercial Vessels (NCSV) and Uniform Shipping Laws (USL) Code related to operation of propulsion plants and ancillary equipment.

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC4001A Manage a propulsion unit using appropriate engine systems and support services.

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 MARC011 Manage a propulsion unit using appropriate engine systems and support services

Modification History

Release 2. Performance Evidence and Knowledge Evidence amended to include correct information.

Release 1. New unit of competency.

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:

- carrying out necessary calculations associated with managing propulsion unit
- communicating effectively with other personnel
- keeping records of monitoring and operation of safety and fire detection/suppression equipment, and any required remedial action
- maintaining records of operation and maintenance of propulsion unit, ancillary power units, equipment and any related safety incidents
- monitoring and evaluating performance of propulsion unit, ancillary power units and equipment
- reading and interpreting:
 - manufacturer instructions for operation of propulsion systems and auxiliary systems
 - maritime regulations, rules and instructions
- recognising problems that may occur with remote control of propulsion unit, ancillary power units and equipment, and taking appropriate preventative and remedial action
- recognising when performance of propulsion unit or ancillary power units and equipment is unsatisfactory or outside specified limits and taking appropriate action
- working collaboratively with other shipboard personnel and passengers during vessel operations.

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:

- characteristics of propulsion units, ancillary power units and equipment including operational limits, vessel stopping distances and turning circles at various draughts, speeds and conditions of loading
- dangers associated with operation of shipboard ancillary power units and related hazard prevention strategies
- marine engineering terms

- methods for controlling and managing operation of shipboard propulsion units, ancillary power units and equipment
- principles of operation and control of various shipboard emergency systems
- problems associated with remote control of propulsion unit, ancillary power units and equipment and appropriate preventative and remedial action and solutions
- procedures for monitoring and evaluating performance of propulsion unit, ancillary power units and equipment
- relevant sections of state and territory maritime regulations, National Standard for Commercial Vessels (NSCV) and Uniform Shipping Laws (USL) Code
- relationship between vessel speed and fuel consumption, including meaning of economical revolutions per minute (RPM) and its application
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- requirements for waste management and control systems under the MARPOL Convention
- Sequence of required action when power unit becomes overloaded.

Assessment Conditions

Assessors must satisfy National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) assessor requirements.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

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.

Resources for assessment must include access to:

- tools, equipment, machinery, materials and personal protective equipment currently used in industry
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- range of relevant exercises, case studies and/or simulations.

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