



Australian Government

MARC047 Manage a propulsion unit using appropriate engine systems and support services

Release: 2

MARC047 Manage a propulsion unit using appropriate engine systems and support services

Modification History

Release 2. This is the second release of this unit of competency in the MAR Maritime Training Package.

- Minor statement changes in unit Application
- Minor MO505 statement changes in Knowledge Evidence
- Minor statement changes in Assessment Conditions.

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 operate a propulsion unit using appropriate engine systems and support services according to technical specifications and safe operating limits.

It includes preparing for operation; operating propulsion unit, engine systems and support services; completing operations and checking propulsion unit, engine systems and support services.

This unit applies to people working in the maritime industry in the capacity of Master up to 45 metres Near Coastal.

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 of a commercial vessel up to 45 metres Near Coastal and Mate up to 100 metres Near Coastal as specified in Marine Order 505.

Seafarers seeking certification should check with AMSA.

Pre-requisite Unit

Not applicable.

Competency Field

C – Equipment Operations

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.

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
- 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 (PPE) 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 are 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

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| | 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 | Shutdown 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

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 MARC011 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 MARC047 Manage a propulsion unit using appropriate engine systems and support services

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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:

- carrying out necessary calculations associated with managing propulsion unit
- communicating effectively with other personnel
- completing routine pre-operational wheelhouse checks of propulsion unit, engine systems and support services, including:
 - ancillary systems and controls
 - engine systems and controls
 - gearing systems
 - hydraulic systems and controls
 - performance indicators
 - power generating units and controls
 - pumps and pumping systems:
 - bilge systems
 - cooling water systems
 - water pumping systems
 - safety alarm systems
 - speed and fuel consumption indicators
 - steering gear
- conducting wheelhouse shutdown and securing procedures for propulsion unit, engine systems and support services, including:
 - ancillary systems and controls
 - cooling water systems
 - engine systems and controls
 - hydraulic systems and controls

- power generating units and controls
- pumps and pumping systems:
 - bilge systems
 - water pumping systems
- safety alarm systems
- speed indicators
- steering gear
- keeping records of monitoring and operation of safety and fire detection/suppression equipment, and any required remedial actions
- 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
- operating and monitoring propulsion unit, engine systems and support services safely, including:
 - ancillary systems and controls
 - engine systems and controls
 - gearing systems
 - hydraulic systems and controls
 - performance indicators
 - power generating units and controls
 - pumps and pumping systems:
 - bilge systems
 - cooling water systems
 - water pumping systems
 - safety alarm systems
 - speed and fuel consumption indicators
 - steering gear
- reading and interpreting:
 - manufacturer instructions and recommended procedures for operation of propulsion systems and auxiliary systems
 - maritime regulations, rules and instructions
 - operational orders from the organisation's safety management system (SMS)
- recognising when performance of propulsion unit or ancillary power units and equipment is unsatisfactory or outside specified limits and taking appropriate actions
- 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
- operation of fire detection and suppression systems
- pre-start checks, operation, monitoring, shutdown and post-operational checks of:
 - bow and stern thruster units
 - controllable pitch propellers (CPP)
- principles of operation and control of various shipboard emergency systems
- procedures to be undertaken in the event of emergencies must include:
 - fire or explosion
 - flooding
 - loss of:
 - propulsion
 - electrical power
 - steering
- problems associated with remote control of propulsion unit, ancillary power units and equipment and appropriate preventative and remedial actions and solutions
- procedures for monitoring and evaluating performance of propulsion unit, ancillary power units and equipment
- relationship between vessel speed and fuel consumption, including meaning of economical revolutions per minute (r.p.m.) and its application
- relevant sections of state and territory maritime regulations, Marine Order 505 and Uniform Shipping Laws (USL) Code related to operation of propulsion plants and ancillary equipment
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- requirements for waste management and control systems under the International Convention for the Prevention of Pollution from Ships (MARPOL)
- sequence of required actions when power unit becomes overloaded
- support services.

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 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:

- a commercial vessel greater than or equal to 12 metres in length
- applicable documentation, such as legislation, regulations, codes of practice, safety management system (SMS), equipment manufacturer's instructions, workplace procedures and operational manuals
- plant and equipment manufacturer instructions and recommended procedures
- relevant sections of state and territory maritime regulations, NCSV and USL Code related to operation of propulsion plants and ancillary equipment
- propulsion unit and engine systems must include:
 - ancillary systems and controls
 - 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
- tools, equipment, materials and personal protective equipment (PPE) currently used in industry.

Links

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