



Australian Government

**Assessment Requirements for MARC045
Contribute to the operation of engine
equipment and associated propulsion plant**

Release: 1

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Modification History

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

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:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices, including:
 - awareness of hazards involved in engines, propulsion plan and auxiliary equipment operation
 - pollution control practices
 - safe entry into pump room, fuel tanks and other confined spaces on a vessel
- attending to appropriate level of detail in recordkeeping
- avoiding polluting the environment
- identifying problems that occur during the operation of engines on vessels
- interpreting and following procedures for the operation, monitoring and evaluation of the performance of engines on vessels
- operating bilge and ballast systems, under the supervision of the officer in charge of the engineering watch, according to manufacturer instructions and workplace procedures
- producing reliable documentation
- reading and interpreting:
 - equipment performance readings and instrumentation
 - lock out and tagging procedures
 - safety data sheets (SDS)/material safety data sheets (MSDS)
- recognising and reporting electrical hazards and unsafe equipment
- selecting and using tools required for operating, monitoring and evaluating the performance of engines on vessels
- testing machinery, under the supervision of the officer in charge of the engineering watch, according to manufacturer instructions and workplace procedures.

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:

- accessing and understanding typical SDS/MSDS, vessel and machinery specifications, machine drawings, operation manuals, electrical and control circuit diagrams
- appropriate use and selection of personal protective equipment (PPE)
- causes of electric shock and precautions to be observed to prevent shock
- emergencies, including:
 - crankcase and gearbox explosions
 - gearbox failure
 - scavenge and uptake fires
 - starting air line
- hazards and problems that can occur during the operation and performance of engines, propulsion plant and auxiliary machinery and appropriate preventative and remedial actions and solutions
- methods of providing air for combustion in the vessel engine room
- national and international regulations, International Maritime Organization (IMO) conventions and codes, and class rules applicable to the operation and performance evaluation of engines, propulsion plant and auxiliary machinery on vessels
- nature and causes of typical malfunctions and/or poor performance of engines, propulsion plant and auxiliary machinery, and the available methods for their detection and rectification
- principles and functions of machinery space monitoring and alarm systems principles and operational characteristics of:
 - auxiliary boilers and associated equipment
 - controllable pitch propellers (CPP)
 - direct drive propulsion systems
 - internal combustion engines
 - jet propulsion
 - marine gas engines
 - reduction boxes
 - steam turbines, gearing and associated equipment as they apply to auxiliary systems
 - thrusters (Z pellers, azimuth, tunnel)
 - Voith Schneider Units
- principles of:
 - detection, identification and repair of faults
 - engine cooling and lubrication
 - fuel systems, including heavy fuel oil (HFO) and diesel
 - marine control systems
 - operation of hydraulic and electronic governors and overspeed trips
- procedures for:
 - carrying out performance evaluation of engines, propulsion plant and auxiliary machinery
 - testing and treating auxiliary boiler water, machinery cooling water and lubricating oil
- preventative strategies for scavenge and uptake fires, and starting air lines, crankcase and

gearbox explosions

- relevant WHS/OHS requirements, work practices and pollution control regulations and policies
- rights and responsibilities of individuals regarding lock out and tagging of plant and equipment
- safe function, operation and maintenance of bilge and ballast systems
- safe operation of equipment, including valves and pumps
- safe use and operation of electrical equipment, including safety precautions before commencing work or repair, isolation procedures, emergency procedures and different voltages on board
- safety, environmental and hazard control precautions and procedures relevant to the operation and performance of engines, propulsion plant and auxiliary machinery
- shafting systems, oil fill stern tube, pedestal bearings and thrust bearings
- the use of safe isolation systems and the application of lock out tags.

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

Companion Volume implementation guide can be found in VetNet -

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