



Australian Government

**Assessment Requirements for MARC015
Operate marine internal combustion
engines and associated systems up to 1500
kW**

Release: 1

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Modification History

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 marine internal combustion engines and associated systems including calculating:
 - areas and volumes of various shapes and circumference of circles
 - calibration tables
 - lubricating oil and fuel oil consumption, rate of fuel consumption (RFC), specific fuel consumption (SFC), effects on RFC and fuel requirements due to change in vessel speed or voyage deviations
 - relationship between vessel speed and fuel consumption, including the meaning of economical revolutions per minute (RPM) and its application
 - tank capacities and pumping capacities for filling and emptying
- maintaining records of operating and maintaining marine internal combustion engines and associated systems, and any related safety incidents
- reading and interpreting:
 - manufacturer instructions for operating marine internal combustion engines and associated systems
 - maritime regulations, rules and instructions
- reading and monitoring various gauges and instruments to evaluate the performance of marine internal combustion engines and associated systems
- recognising problems that may occur with marine internal combustion engines and associated systems, and taking appropriate preventative and remedial action
- recognising when performance of marine internal combustion engines and associated systems is unsatisfactory or outside of specified limits and taking appropriate action.

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 marine internal combustion engines and associated systems including operational limits
- control systems
- cooling water system and components

- crankcase explosions and appropriate preventative and remedial action and solutions
- dangers associated with operating shipboard marine internal combustion engines and associated systems, and related hazard prevention strategies
- engine protection arrangements
- force diagrams
- fuel system including pumps and injectors
- lubricating oil systems and components
- materials and construction techniques of marine internal combustion engines and associated systems
- methods for controlling and managing the operation of shipboard marine internal combustion engines and associated systems
- own ability and limits to rectify irregularities and faults
- pollution control measures under relevant local, state, territory and commonwealth legislation
- problems associated with marine internal combustion engines and associated systems, and appropriate preventative and remedial action and solutions
- procedures for monitoring and evaluating performance of marine internal combustion engines and associated systems
- relationship between vessel speed and fuel consumption, including the meaning of economical RPM and its application
- relevant sections of state and territory maritime regulations and NSCV
- relevant work health and safety (WHS)/occupational health and safety (OHS) legislation and policies
- requirements for emission control from internal combustion engines under the International Convention for the Prevention of Pollution from Ships (MARPOL)
- sequence of required action when there is a major fault on main propulsion engine
- surroundings and changes to these surroundings
- technological changes in engine and control system designs
- turbocharging systems.

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.

Links

Companion Volume implementation guides are found in VETNet -

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