



Australian Government

**Assessment Requirements for MARC007
Operate marine internal combustion
engines, and propulsion and auxiliary
systems**

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:

- arranging maintenance according to technical specifications
- checking pressures, temperatures and revolutions during start-up and warm-up periods according to technical specifications
- complying with vessel operating procedures and manufacturer recommendations for start-up and making available fuel, lubricants, cooling water and air
- identifying:
 - main difference between two- and four-stroke cycles of operation
 - major parts of marine internal combustion engines
 - marine propulsion systems components and explaining their functions
- implementing safe and environmentally responsible work practices
- initiating timely action in response to defects or damage
- managing fuel systems safely according to regulations, manufacturer instructions and vessel procedures, so as to prevent pollution of the marine environment
- operating:
 - lubricating systems according to established procedures and so as to prevent pollution of the marine environment
 - main propulsion plant auxiliary systems to ensure safe operating conditions
 - marine internal combustion engines within technical specifications
 - pumping systems according to manufacturer instructions, operational procedures and regulations to ensure safety of operation and prevention of pollution of the marine environment
 - refrigeration system according to manufacturer instructions, operational procedures and regulations to ensure safety of operation and prevention of pollution of the marine environment
- outlining operation and servicing propulsion system within the technical specifications
- preparing shut-down and supervising cooling down of engine according to vessel operating procedures and manufacturer recommendations
- reading and interpreting manufacturer specifications
- recognising and repairing basic operational faults or organising maintenance assistance
- testing steering arrangements according to manufacturer instructions, operational procedures and regulations.

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:

- air filters
- back-flooding prevention
- basic:
 - combustion process
 - governor operation
 - timing diagrams
- bearing types, materials, installation, lubrication
- causes of vibration and undue wear
- circulating pumps
- controllable pitch propellers
- cooling systems including keel cooling/heat exchangers, circulating pumps, ship's side valves, coolant circulation and thermostats
- corrosion
- couplings types, fittings, keys and keyways
- drive systems, belts, clutches, motors, etc. of pumping systems
- dual duty systems/cross connection
- emergency procedures
- engine watchkeeping
- fault identification, maintenance, prevention of corrosion
- fuel system fault-finding and possible emergency operation
- fuel systems including petrol/diesel, carburettors/fuel injectors, common rail
- gear box fault identification and emergency operation
- glands, packing, seals
- identification of components of refrigeration systems
- injection pumps
- inspection and checks of main and auxiliary machinery and associated spaces
- instrumentation
- keeping running and maintenance logs
- lubricating systems including lube oil circulating systems, lube oil system components, general lubrication, cooling effects and lubrication system problems
- main differences between two- and four-stroke cycles of operation
- maintenance and inspection
- marine two- and four-stroke:
 - diesel engines
 - petrol engines
- major parts of marine internal combustion engines
- operation of firefighting equipment in engine space
- own ability and limits to rectify irregularities
- power transmission operation
- propeller and intermediate shafting alignment
- pumping systems including fire/bilge/tank circulating systems
- refrigeration systems including hazards of refrigerant gases
- relevant environmental responsibilities, regulations and legislative requirements

- rudder and stock support bearings
- running checks
- shaft seals and glands, packings
- start-up and shut-down procedures
- steering operation of hydraulic, cable, rod and gear
- steering systems including rudder construction and rudder types
- sterndrive and water jet drive units
- strainers, mudboxes, foot valves
- testing of steering and hydraulic systems
- tiller arm attachment
- turbo/supercharging
- use of flexible materials, hoses
- valve types:
 - construction and routine servicing
- work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices.

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 including:
 - boots
 - gloves
 - hard hat
 - hearing protection
 - overalls
 - protective eyewear
- respirator or face mask
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- range of relevant exercises, case studies and/or simulations.

Links

MAR Maritime Training Package Companion Volume Implementation Guide at: -
http://companion_volumes.vetnet.education.gov.au/Pages/TrainingPackage.aspx?pid=22