



Australian Government

MARC025 Operate and maintain engines for auxiliary systems other than steam auxiliary systems

Release: 1

MARC025 Operate and maintain engines for auxiliary systems other than steam auxiliary systems

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate and perform basic maintenance on non steam driven auxiliary systems according to relevant workplace practices and codes of practice. It includes operating controls, monitoring performance and maintaining operational condition of auxiliary equipment during use.

This unit applies to engine workers working in the maritime industry as a Marine Engine Driver Steam.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

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.

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|--------------------------|---|
| 1 Prepare for sea | 1.1 Spares and stores required for proposed voyage are acquired |
| | 1.2 Preparations and checks are completed prior to sailing |
| | 1.3 Flammable/explosive materials are stowed and managed according to regulatory and organisational requirements |
| | 1.4 Engines are started according to manufacturer specifications and organisational requirements |

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| | 1.5 | Deviations from norm are promptly identified and rectified or referred |
| | 1.6 | Adjustments are made to achieve a safe and efficient operation |
| | 1.7 | Inability to start engine is reported, and logged promptly and accurately to appropriate personnel |
| 2 Operate internal combustion engines and auxiliary systems | 2.1 | Engines and auxiliary systems are operated within technical specifications |
| | 2.2 | Engines and auxiliary systems are operated and monitored to ensure they are within operating limits specified by organisational procedures and manufacturer recommendations |
| | 2.3 | Environmental implications associated with operating engines and auxiliary systems are identified and controlled |
| | 2.4 | Operational faults are recognised and rectified according to manufacturer specifications and fault-finding methods |
| | 2.5 | Appropriate action is taken in a malfunction or emergency |
| 3 Secure machinery after voyage | 3.1 | Vessel, equipment and machinery are locked down according to manufacturer specifications and organisational procedures |
| | 3.2 | Operational records are completed according to workplace procedures |
| | 3.3 | Damage and repairs requiring action are reported according to workplace procedures |
| 4 Plan maintenance activities | 4.1 | Maintenance plan is accessed to determine maintenance requirements for engines and auxiliary systems |
| | 4.2 | Inspections are conducted and additional non-routine maintenance requirements are determined |
| | 4.3 | Tasks are planned and sequenced in conjunction with others involved in or affected by maintenance work |

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.

Spares and stores include one or more of the following:	• appropriate oils and grease • cleaning material • machinery spare parts • shackles and other lifting equipment • tools, hand and power
Preparations and checks must include:	• checking: • coolants levels • fuel level • filters • confirming correct pressures of auxiliary systems • dip oil • inspecting: • batteries and turn on isolator • for leaks and faults • safety guards, power take off stubs and shafts • lubrication • opening valves as appropriate • power leads • spares and stores • stowage of LPG cylinders
Flammable/explosive materials include one or more of the following:	• liquid fuels • LPG • refrigerant gas
Engines and auxiliary systems include one or more of the following:	• auxiliary equipment and associated spaces • cooling systems • lubricating systems • marine two- and four-stroke diesel engines • paddle and shafting arrangements • propeller and immediate shafting alignment • pumping systems • refrigeration systems • steering systems
Environmental	• excessive noise and exhaust emissions

implications must include:

- loss of fuel and oil overside

Emergencies include one or more of the following:

- failure of the auxiliary engines
- fire

- flooding
- loss of steering

Operational records include one or more of the following:

- maintenance logs
- running logs

Maintenance requirements include one or more of the following:

- cleaning:
 - coolers
 - filters
- greasing
- maintaining emergency equipment
- oiling
- oily water separator
- overhauling and repairing pumps
- scheduled survey inspections
- topping up oils

Unit Mapping Information

This unit replaces and is equivalent to MARC3004A Operate and maintain engines for auxiliary systems other than steam auxiliary systems.

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 MARC025 Operate and maintain engines for auxiliary systems other than steam auxiliary systems

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, performance criteria and range of conditions on at least one occasion and include:

- applying relevant work health and safety/occupational health and safety (WHS/OHS) requirements and work practices
- attending to appropriate level of detail in recordkeeping
- managing:
 - refrigerant gases
 - lubricating systems and prevent pollution of marine environment
 - cooling systems
 - pumping systems and prevent pollution of marine environment
- operating and maintaining steering systems
- operating marine auxiliary internal combustion engines within technical specifications
- preparing machinery for sea
- recognising and rectifying operational faults
- securing machinery after voyage

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- basic constructional parts of marine auxiliary internal combustion engines
- bilge pumping for vessels with several compartments
- common faults in steering gear
- construction and maintenance of heat exchangers
- corrosion prevention
- cross connections between bilge/ballast/seawater systems and fire main
- dangers associated with:
 - back-flooding and methods to prevent back-flooding
 - LPG and petrol vapour

- dangers of refrigerant gas leaks in confined spaces
- diesel engine:
 - construction
 - fuel injection, timing and control equipment
 - operation and routine maintenance
- dry sump and wet sump lubrication systems
- electro-hydraulic steering gear
- emergency steering
- engine:
 - performance and reasons for lack of performance
 - protection arrangements
- heat exchanger, keel cooler and raw water cooling systems
- own ability and limits to rectify irregularities and faults
- oil quality monitoring and filter changing procedures
- planned maintenance
- preparations and checks necessary before sailing
- pump capabilities and requirements for priming
- relevant licensing, legislative, regulatory or certification requirements
- routine maintenance on steering systems
- seawater circulating systems
- securing machinery after voyage
- shutting down machinery
- storage and testing of LPG cylinders
- testing of steering gear
- two- and four-stroke cycles of operation
- types of pumps and safety devices

Assessment Conditions

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

Assessment must satisfy the National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) standards.

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.

Assessment must occur in workplace operational situations or where these are not available, in simulated workplace operational situations or an industry-approved marine operations site that replicates workplace conditions where operating and maintaining engines for auxiliary systems can be conducted.

Resources for assessment include access to:

- relevant documentation including workplace procedures, regulations, codes of practice and operation manuals
- tools, equipment and personal protective equipment currently used in industry

Performance should be demonstrated consistently over time and in a suitable range of contexts.

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