



Australian Government

MARB035 Contribute to routine engine maintenance on a vessel

Release: 1

MARB035 Contribute to routine engine maintenance on a vessel

Modification History

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 contribute to servicing engines and engine components on a vessel.

This unit applies to people working in the maritime industry in the capacity of:

- Able Seafarer - Engine or Integrated Rating who assists under the direction of the officer in charge of the engineering watch in performing a range of engine maintenance activities on a range of vessels
- Navigational Watch - Deck/Engine.

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 an Able Seafarer - Engine, Integrated Rating or Navigational Watch - Deck/Engine and to meet regulatory requirements this unit must be delivered consistent with Marine Orders and with the relevant sections of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).
- Those regulatory requirements include STCW International Maritime Organization (IMO) model course competencies and areas of knowledge, understanding and proficiency, together with the estimated total hours required for lectures and practical exercises. Teaching staff should note that timings are suggestions only and should be adapted to suit individual groups of trainees depending on their experience, ability, equipment and staff available for training.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|--|--|
| 1 Plan engine maintenance tasks | 1.1 Planned maintenance system is accessed to establish engine maintenance requirements for vessel |
| | 1.2 Maintenance tasks are proposed and prioritised in conjunction with others involved in or affected by the maintenance work |
| | 1.3 Resource requirements are identified and accessed to ensure efficient completion of tasks |
| | 1.4 Maintenance tasks are recorded in the maintenance schedule according to workplace procedures |
| 2 Prepare for engine service | 2.1 Nature and scope of work requirements are confirmed according to workplace procedures |
| | 2.2 Service procedures, workshop manuals and manufacturer specifications are accessed and interpreted |
| | 2.3 Tools, equipment and materials required for servicing are identified and prepared |
| | 2.4 Engine and components are visually inspected for external signs of defects according to maintenance documentation |
| | 2.5 Electrical components are identified and electrical equipment used safely |
| | 2.6 Engine is started, ran up to operating temperature and checked for leaks, abnormal noises and pressures |
| | 2.7 Test results are compared with manufacturer/component supplier specifications to determine compliance or non-compliance |
| | 2.8 Results are documented with supporting information and recommendations are made about serviceability and |

- repair
- 3 Service engines and engine components**
 - 3.1** Work health and safety (WHS)/occupational health and safety (OHS) requirements are identified and observed
 - 3.2** Service operations are performed according to workplace procedures and manufacturer/component supplier specifications
 - 3.3** Fluid level checks and replenishments are carried out according to manufacturer/component supplier specifications
 - 3.4** Appropriate lubricants are applied to engine
 - 3.5** Equipment/components requiring replacement are changed according to manufacturer/component supplier specifications
 - 3.6** Adjustments are made according to manufacturer/component supplier specifications
 - 4 Complete work**
 - 4.1** Engine is inspected to ensure protective guards, cowlings and safety features are in place
 - 4.2** Engine is cleaned according to workplace procedures
 - 4.3** Materials to be reused are collected and stored according to manufacturer specifications and workplace procedures
 - 4.4** Tools and equipment are cleaned, maintained and stored according to manufacturer specifications and workplace procedures
 - 4.5** Waste and scrap are removed according to legislative requirements and workplace procedures
 - 4.6** Unserviceable equipment is tagged and faults are identified and reported according to workplace 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 MARB016 Contribute to routine engine maintenance on a vessel.

Links

Companion Volume implementation guide can be found in VetNet -

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

Assessment Requirements for MARB035 Contribute to routine engine maintenance on a vessel

Modification History

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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:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices
- appropriately using and selecting personal protective equipment (PPE)
- assisting in maintaining and servicing marine systems/components, including:
 - batteries
 - cooling systems/components
 - engine mounting systems/components
 - exhaust systems/components
 - fuel systems/components
 - intake systems/components
 - lubrication systems/components
- communicating with other personnel using effective:
 - listening techniques
 - questioning to confirm understanding
 - verbal and non-verbal language
- confirming maintenance to be undertaken and identifying resource requirements with the officer in charge of the engineering watch
- ensuring behaviour reflects relevant current legislative and regulatory requirements
- ensuring currency of relevant WHS/OHS skills and knowledge
- identifying hazards and safety issues and reporting these to the engineering officer of the watch
- identifying tools, equipment and materials required to undertake maintenance tasks
- using electrical equipment safely and applying:
 - correct emergency procedures
 - different voltages in use onboard vessel
 - isolation procedures
 - precautions to prevent electric shock
 - safety precautions before commencing work

- using painting, lubrication and cleaning materials and equipment safely.

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:

- causes of electric shock and precautions to be observed to prevent shock
- electrical principles covering voltage, current, resistance, power, magnetic and inductance
- engine room cleaning procedures and relevant cleaning agents
- engine room hazards and safety, including:
 - electrical safety
 - gas testing
 - head of water/fluid
 - heat stress
 - high pressures
 - hot fluids
 - mechanical safety
 - noise
 - pollution
 - steam
 - toxic gases
 - ventilation
 - vibration
- engine room machinery and equipment, including:
 - air compressors
 - air start systems
 - bilge system, bilge pumps, bilge pick-ups, bilge valves and bilge piping
 - engine protection devices (crankcase mist detectors)
 - hydraulic systems, power packs, rams and motors, and directional control valves (DCVs)
 - oily water separators
 - osmosis plant
 - pumps – positive displacement, centrifugal and axial flow
 - purifiers and clarifiers
 - refrigeration and air conditioning plant
 - sewage treatment plant
 - slow speed, medium speed and high-speed diesels
 - steering systems
 - valves – globe and full flow, screw down non-return, screw lift, butterfly, ball, relief, non-return and gate

- water making (both freshwater generators and reverse)
- maintenance and servicing tasks, including:
 - economiser cleaning
 - engine room rounds (daily/weekly/monthly maintenance checks)
 - greasing and oiling of machinery
- inspection and maintenance of:
 - hatches, watertight doors and deadlights
 - hoists and lifting equipment
- manufacturer safety guidelines and shipboard instructions
- mechanical principles covering the concepts of mechanical, hydraulic and pneumatic systems
- purpose of isolation procedures and application of lock out tags
- relevant WHS/OHS requirements, work practices and pollution control regulations and policies
- rights and responsibilities of individuals about lock out and tagging of plant and equipment
- routine inspection of hand and power tools, measuring instruments and machinery tools
- routine maintenance and repair procedures
- safe disposal of waste materials
- scavenge space cleaning
- soot blowing
- surface preparation and painting
- surface preparation techniques, including:
 - abrasive blast cleaning
 - hand and power tool cleaning
- types, functions and limitations of marine equipment/components, including:
 - cooling systems/components
 - engine mounting systems/components
 - engines
 - exhaust systems/components
 - fuel systems/components
 - intake systems/components
 - lubrication systems/components.

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.

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