



Australian Government

MARB039 Maintain and repair shipboard machinery and equipment

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.

Application

This unit involves the skills and knowledge required to maintain and repair shipboard machinery and equipment on a vessel. This includes maintaining marine pumps, valves, air compressors, heat exchangers, diesel engines, turbochargers, marine lubricating systems and deck machinery as well as conducting inspections of marine boilers and marine refrigeration units.

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

- Electro-Technical Officer (STCW Electro-Technical Officer Unlimited)
- Engineer Class 3 Near Coastal
- Engineer Watchkeeper (STCW Engineer Watchkeeper Unlimited).

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 Engineer Class 3 Near Coastal as defined in the National Standard for Commercial Vessels (NSCV) Part D.
- This unit is one of the requirements to obtain AMSA certification as an Electro-Technical Officer (STCW Electro-Technical Officer Unlimited) or Engineer Watchkeeper (STCW Engineer Watchkeeper Unlimited) 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.

1 Follow safe work practices

- 1.1 Work health and safety (WHS)/occupational health and safety (WHS/OHS) procedures relevant to maintaining shipboard machinery and equipment are complied with
- 1.2 Safety hazards are identified and reported according to safety and vessel procedures
- 1.3 Tools, equipment and testing devices needed to carry out maintenance activities are checked for correct operation and safety prior to use according to safety and vessel procedures
- 1.4 Isolation precautions are implemented prior to commencing maintenance activities according to safety and vessel procedures

2 Maintain marine pumps

- 2.1 Maintenance requirements for pump are determined according to safety, manufacturer and vessel procedures and documentation
- 2.2 Appropriate procedures, materials, tools and equipment for maintaining pump are selected according to safety, manufacturer and vessel procedures
- 2.3 Relevant information is extracted from drawings and technical specifications required to perform maintenance activities
- 2.4 Pump is disassembled, inspected and serviced according to safety, manufacturer and vessel procedures
- 2.5 Pump is reassembled and tested according to safety,

manufacturer and vessel procedures

2.6 Performance of pump is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures

3 Maintain valves

3.1 Maintenance requirements for valves are determined according to safety, manufacturer and vessel procedures and documentation

3.2 Appropriate procedures, materials, tools and equipment for maintaining valves are selected according to safety, manufacturer and vessel procedures

3.3 Relevant information is extracted from drawings and technical specifications required to perform maintenance activities

3.4 Valves are removed for maintenance according to safety, manufacturer and vessel procedures and documentation

3.5 Valves are disassembled and valve maintenance is performed according to safety, manufacturer and vessel procedures and documentation

3.6 Valves are reassembled and tested according to safety, manufacturer and vessel procedures and documentation

4 Maintain air compressors

4.1 Maintenance requirements for air compressor are determined according to safety, manufacturer and vessel procedures and documentation

4.2 Appropriate procedures, materials, tools and equipment for maintaining air compressor are selected according to safety, manufacturer and vessel procedures

4.3 Relevant information is extracted from drawings and technical specifications required to perform maintenance activities

4.4 Air compressor is disassembled and inspected according to safety, manufacturer and vessel procedures

4.5 Air compressor is reassembled, tested and adjusted according to safety, manufacturer and vessel procedures

4.6 Performance of air compressor is confirmed against recommended performance specifications according to

- safety, manufacturer and vessel procedures
- 5 Maintain heat exchangers**
- 5.1** Maintenance requirements for heat exchanger are determined according to safety, manufacturer and vessel procedures and documentation
- 5.2** Appropriate procedures, materials, tools and equipment for maintaining heat exchanger are selected according to safety, manufacturer and vessel procedures
- 5.3** Relevant information is extracted from drawings and technical specifications required to perform maintenance activities
- 5.4** Heat exchanger is disassembled and inspected according to safety, manufacturer and vessel procedures
- 5.5** Heat exchanger is reassembled, tested and adjusted according to safety, manufacturer and vessel procedures
- 5.6** Performance of heat exchanger is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures
- 6 Maintain diesel engines**
- 6.1** Maintenance requirements for diesel engine are determined according to safety, manufacturer and vessel procedures and documentation
- 6.2** Appropriate procedures, materials, tools, measuring instruments and equipment for maintaining diesel engine are selected according to safety, manufacturer and vessel procedures
- 6.3** Relevant information is extracted from drawings and technical specifications required to perform maintenance activities
- 6.4** Diesel engine components are disassembled and inspected for wear and deterioration according to safety, manufacturer and vessel procedures
- 6.5** Routine maintenance on diesel engines is performed according to manufacturer and vessel procedures
- 6.6** Diesel engine components are refurbished, as required, according to manufacturer and vessel procedures
- 6.7** Specialised tools and measuring instruments are used to maintain and refurbish diesel engines/components

- according to safety, manufacturer and vessel procedures
- 6.8** Diesel engine is reassembled, tested and adjusted according to safety, manufacturer and vessel procedures
- 6.9** Performance of diesel engine is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures
- 7 Maintain turbochargers**
- 7.1** Maintenance requirements for turbocharger are determined according to safety, manufacturer and vessel procedures and documentation
- 7.2** Appropriate procedures, materials, tools and equipment for maintaining turbocharger are selected according to safety, manufacturer and vessel procedures
- 7.3** Relevant information is extracted from drawings and technical specifications required to perform maintenance activities
- 7.4** All components of turbocharger are disassembled and inspected for wear and deterioration according to safety, manufacturer and vessel procedures
- 7.5** Turbocharger is reassembled, tested and adjusted according to safety, manufacturer and vessel procedures
- 7.6** Performance of turbocharger is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures
- 8 Inspect marine boilers**
- 8.1** Inspection requirements for marine boiler are determined according to safety, manufacturer and vessel procedures and documentation
- 8.2** Appropriate procedures for inspecting marine boiler are selected according to safety, manufacturer and vessel procedures
- 8.3** Relevant information is extracted from drawings and technical specifications required to perform inspection activities
- 8.4** Marine boiler is inspected for repair or general maintenance according to safety, manufacturer and vessel procedures
- 8.5** Performance of marine boiler is confirmed against recommended performance specifications according to

- safety, manufacturer and vessel procedures
- 9 Inspect marine refrigeration units**
- 9.1** Inspection requirements for marine refrigeration unit are determined according to safety, manufacturer and vessel procedures and documentation
- 9.2** Appropriate procedures for inspecting marine refrigeration unit are selected according to safety, manufacturer and vessel procedures
- 9.3** Relevant information is extracted from drawings and technical specifications required to perform inspection activities
- 9.4** Marine refrigeration unit is inspected for repair or general maintenance according to safety, manufacturer and vessel procedures
- 9.5** Performance of marine refrigeration unit is confirmed against recommended performance specifications according to safety, manufacturer and vessel procedures
- 10 Maintain marine lubricating systems**
- 10.1** Inspection and maintenance requirements for lubricating systems are determined according to safety, manufacturer and vessel procedures and documentation
- 10.2** Relevant information is extracted from drawings and technical specifications required to perform inspection and maintenance activities
- 10.3** Purifier maintenance procedures are applied according to safety, manufacturer and vessel procedures
- 10.4** Components of lubricating system are inspected according to safety, manufacturer and vessel procedures
- 11 Maintain and repair deck machinery**
- 11.1** Maintenance and/or repair requirements for deck machinery are determined according to safety, manufacturer and vessel procedures and documentation
- 11.2** Appropriate procedures, materials, tools and equipment for maintaining and/or repairing deck machinery are selected according to safety, manufacturer and vessel procedures
- 11.3** Relevant information is extracted from drawings and technical specifications required to perform maintenance activities

- 11.4 Deck machinery maintenance and/or repair procedures are implemented according to safety, manufacturer and vessel procedures
- 11.5 Deck machinery is tested and adjusted according to safety, manufacturer and vessel procedures
- 11.6 Performance of deck machinery is confirmed against recommended performance specifications according to safety, manufacturer and vessel 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 is equivalent to MARB014 Maintain and repair shipboard machinery and equipment.

Links

Companion Volume implementation guide can be found in VetNet -

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