



**Australian Government**

# **MARB032 Undertake basic maintenance of electrical systems**

**Release: 2**

# MARB032 Undertake basic maintenance of electrical systems

## Modification History

**Release 2.** This is the second release of this unit of competency in the MAR Maritime Training Package.

- Minor statement changes in unit Application
- Minor statement changes in Assessment Conditions.

**Release 1.** New unit of competency. Licensing/regulatory information has been incorporated in accordance with Regulatory requirements. Assessment Requirements have been strengthened in accordance with Regulatory requirements.

## Application

This unit involves the skills and knowledge required to complete basic maintenance of electrical systems.

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

- Marine Engine Driver Grade 1 Near Coastal
- Marine Engine Driver Grade 2 Near Coastal

## 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 a Marine Engine Driver Grade 2 Near Coastal and a Marine Engine Driver Grade 1 NC as specified in Marine Order 505.

Note: Relevant state or territory electrical licensing requirements apply to persons carrying out installation, maintenance and or repair of electrical circuits or systems that are 50 V alternating current (AC) or above, or 120 V direct current (DC) or above.

Seafarers seeking certification should check with AMSA.

## 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.

#### **1 Plan maintenance activities**

### PERFORMANCE CRITERIA

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

**1.1** Maintenance plan is accessed to determine electrical system maintenance requirements

**1.2** Inspections are conducted and additional non-routine maintenance requirements are determined

**1.3** System specifications and diagrams for electrical systems are obtained

**1.4** Tasks are planned and sequenced in conjunction with others involved in or affected by maintenance work

**1.5** Consumables and equipment are selected and checked for serviceability

#### **2 Complete preventative maintenance**

**2.1** Electrical system is safely isolated according to regulatory and work health and safety (WHS)/occupational health and safety (OHS) requirements

**2.2** WHS/OHS risk control measures and procedures for carrying out work are followed

**2.3** Preventative maintenance is carried out in compliance with system specifications

**2.4** Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes

**2.5** Work is carried out efficiently without waste of materials and damage to equipment and machinery or other services

**2.6** Maintenance work is checked to verify that it conforms with technical specifications

- |                                              |                                                                                                                                                     |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>3 Complete breakdown maintenance</b>      | <b>3.1</b> Nature of breakdown is confirmed using maintenance records and or log book entries related to reported breakdown                         |
|                                              | <b>3.2</b> Restrictions are applied to operations, as necessary, and Master is notified                                                             |
|                                              | <b>3.3</b> Limits of repair work that can be carried out are established according to relevant state or territory electrical licensing requirements |
|                                              | <b>3.4</b> System is isolated                                                                                                                       |
|                                              | <b>3.5</b> Repair work is carried out according to system specifications                                                                            |
|                                              | <b>3.6</b> Master is notified of completion of repair work and details are documented                                                               |
| <b>4 Clean up and complete documentation</b> | <b>4.1</b> Work area is cleared and cleaned                                                                                                         |
|                                              | <b>4.2</b> Materials are disposed of or recycled according to legislative and workplace requirements                                                |
|                                              | <b>4.3</b> Tools and equipment are cleaned, checked and stored according to workplace procedures                                                    |
|                                              | <b>4.4</b> Electrical system and equipment are put back into service and monitored for correct operation according to organisational practices      |
|                                              | <b>4.5</b> Maintenance report is completed 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 MARB007 Undertake basic maintenance of electrical 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 MARB032 Undertake basic maintenance of electrical systems

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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 safety requirements throughout the work sequence, including the use of personal protective equipment (PPE)
- carrying out maintenance tasks, including:
  - battery maintenance
  - testing:
    - alarm systems
    - emergency generator
    - power and lighting systems
- carrying out simple maintenance of electrical systems in the event of:
  - blown fuses or open circuit breakers
  - earthing
  - failure of electricity generating systems
  - motor brake failure to release
  - motor failure
  - shorting
- implementing safe and environmentally responsible work practices
- performing isolation, lock out and tag out procedures
- planning maintenance activities according to technical, legislative, safety and procedural specifications.

## 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:

- battery:
  - charging systems
  - maintenance
  - operation
  - types and associated hazards
- connection to shore power
- earth indicating devices
- electrical distribution systems
- isolation of electrical circuits
- main faults that can occur in:
  - alternating current (AC) electrical systems
  - direct current (DC) electrical systems
- maintenance requirements for:
  - alarm systems
  - emergency electrical supply
  - emergency generators
  - generators
  - motor starting circuits
  - power and lighting
  - shore supply
  - steering gear circuits
  - switchboards
- procedure for connecting batteries in series and parallel
- single and three-phase AC power
- starter motors, alternators and associated equipment
- switchboard and protection devices
- types of protection devices
- use of multi-meter to test voltage and continuity
- uses of fuses and circuit breakers
- work health and safety (WHS)/occupational health and safety (OHS) requirements.

## 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 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, safety management systems (SMS), workplace procedures and operational manuals
- a commercial vessel with inboard diesel propulsion power of greater than or equal to 150 kW or appropriate engine, propulsion plant, and auxiliary equipment with electrical systems ashore
- tools, equipment, machinery, materials and relevant PPE currently used in industry.

## Links

Companion Volume Implementation Guides are found in VETNet -

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