



Australian Government

MARC042 Operate electrical systems

Release: 2

MARC042 Operate 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 clarification changes in Performance Evidence
- Minor clarification changes in Knowledge Evidence
- 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 operate 220 to 440 Volts alternating current (AC) electrical systems.

This unit 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 NC and a Marine Engine Driver Grade 1 NC as specified in Marine Order 505.

Seafarers seeking certification should check with AMSA.

Pre-requisite Unit

Not Applicable.

Competency Field

C - Equipment Operations

Unit Sector

Not Applicable.

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.

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

1 Prepare electrical systems and equipment for operation

1.1 Risks to self, others and the environment are identified according to organisational procedures

1.2 Pre-operational checks are carried out according to manufacturer specifications and organisational procedures

2 Operate electrical systems and equipment

2.1 Electrical systems and equipment are operated according to manufacturer specifications, regulations and vessel procedures

2.2 Performance of electrical equipment is monitored

2.3 Alternating current (AC) electrical supply is monitored and changed to meet demand

2.4 Operational faults are recognised and recorded, and corrective action is taken according to manufacturer specifications and fault-finding procedures

3 Connect and disconnect ship to shore electrical supply

3.1 Checking vessel is positioned and secured for connecting to shore electrical supply

3.2 Power cable is inspected and connected to shore supply

3.3 Procedures for changing from vessel supply to shore supply are implemented following vessel procedures

3.4 Electrical supply is monitored for correct operation according to vessel procedures

3.5 Operational faults are recognised and recorded, and corrective action is taken according to vessel procedures

3.6 Procedures for changing from shore supply to vessel supply are implemented following vessel procedures

3.7 Power cable is disconnected, inspected and stored

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 MARC010 Operate 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 MARC042 Operate 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 work health and safety (WHS)/occupational health and safety (OHS) and pollution control, legislation and policies
- connecting and disconnecting shore supply
- locating, interpreting and applying manufacturer specifications for electrical systems and equipment
- managing electrical supply to accommodate load demand
- operating and monitoring alternating current (AC) and direct current (DC) electrical systems according to manufacturer recommendations, regulations and vessel operating procedures to ensure safe operation
- operating electrical systems and equipment
- performing isolation, lock out and tag out procedures
- recognising and rectifying operational faults.

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:

- basic care of electrical systems and equipment in general - fault recognition
- batteries:
 - care
 - hazards
 - types

- charging systems:
 - alarms or indicators
 - regulators
- connecting batteries in series and parallel
- emergency supply and regulatory requirements
- fault identification, location and safety implications
- managing low voltage electrical supply to accommodate load demand, including:
 - changing electrical supply to a larger alternator/generator
 - connecting further alternators/generator in parallel
- operation of fuses and circuit breakers
- operation of protection devices on the switchboard including:
 - earth indicating devices
- operation of starter motors, alternators and associated equipment
- personal safety
- process for recognising and rectifying operational faults, including:
 - activation of protection devices on the switchboard
 - battery faults
 - blown fuses and open circuit breakers
 - earth faults
 - failure of alternators to produce voltage
 - failure of starter motors
 - faults with shore power connections including phase rotations
- process for recognising non-essential electrical systems be isolated.
- process for requesting non-essential electrical systems be isolated
- shore power connection
- single and three-phase power
- uses of fuses and circuit breakers and selection of correct capacity
- WHS/OHS requirements and work practices.

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 electrical systems ashore
- tools, equipment, machinery, materials and relevant personal protective equipment (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>