



Australian Government

MARC003 Operate and maintain extra low and low voltage electrical systems and equipment

Release: 1

MARC003 Operate and maintain extra low and low voltage electrical systems and equipment

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to operate, test and maintain extra low and low voltage electrical systems and equipment.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 3 Near Coastal on vessels up to 500 kW or as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW or as a Marine Engine Driver Grade 1 Near Coastal on vessels up to 1500 kW.

WARNING: Relevant state/territory training and qualification requirements need to be fulfilled by any persons carrying out installation, maintenance and/or repair of refrigeration equipment especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work.

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.

1 Operate electrical systems and equipment

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|-----|---|
| 1.1 | Routine pre-operational checks are carried out on electrical systems and equipment according to manufacturer specifications |
| 1.2 | Systems and equipment are operated according to manufacturer specifications |
| 1.3 | Faults are identified and appropriate action is taken to rectify |

		them
	1.4	Faults are reported and logged promptly and accurately to appropriate personnel
2 Carry out routine maintenance on electrical systems and equipment	2.1	Tasks are planned and sequenced in conjunction with others involved in or affected by maintenance work
	2.2	Tools and equipment are selected and checked for serviceability
	2.3	Components to be maintained are isolated
	2.4	Systems are tested and test results are compared with manufacturer specifications
	2.5	Maintenance tasks are carried out to specification
	2.6	Unserviceable components are tagged according to organisational procedures and appropriate personnel are notified
3 Isolate faulty components for repair	3.1	Faulty items or components are isolated according to workplace procedures
	3.2	Serviceable items are fitted according to manufacturer specifications
	3.3	Operational check is carried out on equipment or system to ensure its compliance with manufacturer specification
4 Clean up and complete documentation	4.1	Work area is cleared and cleaned
	4.2	Materials are disposed of or recycled according to legislative and workplace requirements
	4.3	Tools and equipment are cleaned, checked and stored according to workplace procedures
	4.4	Maintenance report is completed according to workplace procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Specifies different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Electrical systems and equipment include one or more of the following:

- alternators
- batteries
- charging systems
- fuses and circuit breakers
- generators
- motors
- shore power connection
- starter motors

Faults include one or more of the following:

- battery faults
- failure of alternators to produce voltage
- failure of starter motors
- faults with shore power connections including phase rotations
- operation of fuses and circuit breakers

Maintenance tasks include one or more of the following:

- replacing fuses
- testing batteries, voltage, electrolyte and rectifying faults
- testing charging system voltage output

Unit Mapping Information

This is a new unit. This unit is equivalent to MARC2003A Operate and maintain extra low and low voltage electrical systems and equipment.

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 MARC003 Operate and maintain extra low and low voltage electrical systems and equipment

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 and performance criteria on at least one occasion and include:

- applying safety requirements throughout the work sequence including the use of personal protective equipment
- completing all work to specification
- ensuring correct requirements and details of basic maintenance of electrical systems and equipment are available
- implementing safe and environmentally responsible work practices in testing and maintenance activities
- initiating timely action in response to defects or damage
- locating, interpreting and applying manufacturer specifications for electrical systems and equipment
- operating direct current (DC) systems and conducting operator preventive maintenance according to manufacturer recommendations, regulations and vessel operating procedures to ensure safe operation
- operating electrical systems according to manufacturer recommendations, regulations and vessel operating procedures to ensure safe operation
- recognising electrical system faults and where necessary taking steps to make them immediately safe
- selecting and using appropriate processes, tools and equipment.

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 and fault recognition of electrical systems and equipment
- batteries:
 - care and maintenance
 - hazards
 - types
- charging systems:
 - alarms/indicators
 - regulators

- connecting batteries
- DC systems not exceeding 32 V DC
- electrical systems:
 - above 32 V DC and up to 415 V alternating current (AC)
- fault identification, location and safety implications
- personal safety
- protective devices on switchboards
- relevant state/territory training and qualification requirements for carrying out installation, maintenance and/or repair of refrigeration equipment especially with regard to preventing the escape of refrigerants into the atmosphere and to electrical work
- shore power connection
- starter motors, alternators and associated equipment:
 - operation
 - maintenance
- uses of fuses and circuit breakers – selection of correct capacity
- work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices.

Assessment Conditions

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

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

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.

Resources for assessment must include access to:

- tools, equipment, machinery, materials and personal protective equipment currently used in industry including:
 - hand and power tools
 - test equipment
 - distilled water
 - rags
 - used components
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- range of relevant exercises, case studies and/or simulations.

Links

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