



Australian Government

MARB044 Operate and maintain ship power systems exceeding 1,000 volts

Release: 1

MARB044 Operate and maintain ship power systems exceeding 1,000 volts

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 operate and maintain ship high voltage (HV) power systems exceeding 1,000 volts (V).

It includes reviewing and managing electrical propulsions of the ship, electrical motors and control systems as part of the ship power system. It also includes HV technology and required documentation.

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

- Electro-Technical Officer (STCW Electro-Technical Officer Unlimited)
- Engineer Class 1 (STCW Chief Engineer Unlimited)
- Engineer Class 2 (STCW Second Engineer Unlimited)
- Engineer Watchkeeper (STCW Engineer Watchkeeper Unlimited).

Licensing/Regulatory Information

Legislative and regulatory requirements are applicable to this unit.

A person competent in this unit will hold either an Unrestricted Electrical Licence issued in an Australian state or territory, a Marine Engineering Certificate of Competency issued under Marine Order 72 or be undertaking an Australian Maritime Safety Authority (AMSA) approved course of study under Marine Order 72, and be able to operate and maintain ship power systems exceeding 1,000 V in accordance to relevant industry standards and regulations.

This unit is subject to the following requirements:

- Legislation, regulations, relevant industry standards and codes of practice for electrical work, including specific work health and safety (WHS)/occupational health and safety (OHS) legislation and regulatory requirements.
- This unit is one of the requirements to obtain AMSA certification as an Electro-Technical Officer (STCW Electro-Technical Officer Unlimited), Engineer Class 1 (STCW Chief Engineer Unlimited), Engineer Class 2 (STCW Second Engineer 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.

- Electrical licence requirements – unrestricted electrical work or relevant industry experience approved by maritime regulator.
- Legislation, regulations, relevant industry standards and codes of practice for ship power systems exceeding 1,000 V.

There may be variations in these requirements across jurisdictions.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1. Review ship power systems operations

2. Manage ship power systems

PERFORMANCE CRITERIA

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

1.1 Ship power systems are identified and analysed from electrical drawings and specifications

1.2 Hazards are identified, risks assessed and control measures implemented

2.1 Operations are carried out in accordance with operational manuals, rules and procedures to ensure safety of operations

2.2 Electrical permit system to work on HV systems are identified and applied

2.3 HV isolation and verification are carried out in accordance with procedures

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| | 2.4 | Ship power systems are visually inspected and tested in accordance with maintenance specification and electrical operation plan |
| | 2.5 | Maintenance work is checked to verify that it conforms with technical specifications |
| | 2.6 | Electrical system is verified prior to re-energising system |
| | 2.7 | HV system is re-energised in accordance with procedures |
| 3. Clean up and complete documentation | 3.1 | Work area is cleared and cleaned |
| | 3.2 | Work area is made safe in accordance with safe electrical working practices |
| | 3.3 | Materials are disposed of or recycled in accordance with legislative and workplace requirements |
| | 3.4 | Tools and equipment are cleaned, checked and stored in accordance with procedures |
| | 3.5 | Maintenance reports are completed in accordance with 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 is a new unit. No equivalent unit.

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 MARB044 Operate and maintain ship power systems exceeding 1,000 volts

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 two separate occasions and include:

- applying work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices
- applying safe operations and maintenance of high voltage (HV) systems procedures, including:
 - de-energising
 - earthing down
 - isolating and switching procedures
 - testing HV electrical systems
- identifying and interpreting complex numerical and graphical information in electrical diagrams
- identifying and suggesting ways of rectifying electrical hazards and emergency situations on a ship
- reading and interpreting written information related to electrical circuitry and components on a ship
- using electrical measuring and testing instruments.

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:

- electrical propulsions of the ships, electrical motors and control systems
- electrical:
 - layout systems
 - measuring and testing instruments
 - shipboard equipment
 - symbols, electrical diagrams/circuits

- HV electrical permit system, including:
 - earthing down
 - isolation and verification methods
 - HV switching
- HV technology
- relevant industry standards
- safety precautions and procedures, including electrical risk mitigation control measures
- special technical types of HV systems and the danger resulting from operational voltage of more than 1,000 volts (V)
- WHS/OHS requirements, including safe electrical working 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 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 ship 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 system, workplace procedures and operational manuals
- HV electrical system
- tools, equipment, machinery, materials and personal protective equipment (PPE) currently used in industry.

Links

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