



Australian Government

AURRTR3004 Install marine electrical systems and components

Release 1

AURRTR3004 Install marine electrical systems and components

Modification History

Release	Comment
Release 1	Replaces AURE320031B Install marine electrical systems and components Unit code updated to meet policy requirements Reference to OHS legislation replaced with new WHS legislation

Unit Descriptor

Unit descriptor	This unit of competency describes the skills and knowledge required to carry out installation of marine low voltage electrical systems and components, including dash instrumentation, switch and fuse panels, bilge pumps, lighting and navigation aids. It requires the ability to identify and confirm work requirements, prepare for, install and test marine electrical systems and components, and complete work finalisation processes. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
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Application of the Unit

Application of the unit	This unit applies to individuals who undertake installation of marine electrical systems and components in a marine environment.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Confirm nature and scope of work to be carried out 1.2. Locate workplace health and safety (WHS) and workplace environmental and sustainable procedures and practices applicable to the work 1.3. Source installation procedures and relevant workshop manuals and manufacturer's information 1.4. Determine installation method in accordance with WHS, environmental and industry regulations and guidelines and enterprise procedures 1.5. Set up work area
2. Install marine electrical systems and components	2.1. Install and wire marine electrical systems and components in accordance with manufacturer and component supplier specifications, and WHS and workplace environmental and sustainable procedures and practices 2.2. Conduct pre-start check, make required adjustments and re-test 2.3. Determine the need for water testing
3. Clean up work area and maintain equipment	3.1. Make final inspection of electrical systems 3.2. Clean and inspect equipment and tooling according to workplace requirements 3.3. Tag unserviceable equipment and faults identified in accordance with workplace requirements 3.4. Finalise and process work completion documentation, update customer and warranty information and give to appropriate persons as required 3.5. Clean work area, dispose of waste and scrap, and store tools and equipment in accordance with workplace procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- technical skills to the level required to use workplace technology related to the installation and testing of marine electrical systems and components, to use specialist tooling and equipment and computerised measuring equipment, and to report and record actions
- communication skills to the level required to confirm work requirements and electrical circuit and component installation procedures and specifications, to communicate effectively regarding work requirements with supervisor, other workers and customers, to relate to people from a range of social, cultural and ethnic backgrounds and of varying physical and mental abilities, and to report work outcomes and problems
- literacy skills to the level required to understand information related to work orders, including common industry terminology and safety procedures, procedures for circuit and component testing, major repairs, installation and component replacement, and to record servicing details
- numeracy skills to the level required to correctly complete tests and measurements to determine electrical circuit and component installation requirements
- problem-solving skills to the level required to identify technical and procedural problems to avoid planning and scheduling problems, and time and material wastage
- team skills to the level required to work effectively and cooperatively with others to optimise workflow and productivity

Required knowledge

Required knowledge includes:

- the principles of electricity
- types of installation materials and their application
- electrical connection, crimping and soldering techniques
- installation and testing procedures for marine electrical systems and components
- measuring and testing procedures
- service and repair manuals (hard copy and electronic)
- manufacturer and component supplier specifications, including workshop manuals and repair guides
- applicable commonwealth, state or territory legislation, regulations, standards and codes of practice, including WHS, personal safety and environment, relevant to installing marine electrical systems
- organisational policies and procedures, including quality, reporting and recording

REQUIRED SKILLS AND KNOWLEDGE

procedures, related to installing marine electrical systems

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessors must be satisfied that the candidate can competently and consistently:

- observe safety procedures and requirements
- communicate effectively with others involved in or affected by the work
- select methods and techniques appropriate to the circumstances
- complete preparatory activity in a systematic manner
- perform electrical connections, including crimping and soldering
- install a range of marine electrical systems and components to manufacturer and component supplier requirements, including dash instrumentation, switch and fuse panels, bilge pumps, and lighting and navigation aids within workplace timeframes
- test prior to placing in service
- complete workplace and equipment records and workplace clean up requirements.

Context of, and specific resources for assessment

- The application of competency is to be assessed in the workplace or a simulated environment that reflects as far as possible the actual working environment.
- Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.
- Assessment is to comply with relevant regulatory requirements, including specified Australian standards.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- The following resources should be made available:
 - workplace location or simulated workplace
 - marine electrical systems and components
 - equipment, hand and power tooling appropriate to

EVIDENCE GUIDE	
	the installation of marine electrical systems and components • specifications and work instructions.
Method of assessment	• Assessment must satisfy the endorsed Assessment Guidelines of this Training Package • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of Required Skills and Knowledge. • Assessment methods must be by direct observation of tasks and include questioning on Required Skills and Knowledge to ensure its correct interpretation and application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.
Guidance information for assessment	Assessment processes and techniques must be culturally sensitive and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT	
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.	
Marine electrical systems	Marine electrical systems may include low voltage: • switch and fuse panels

RANGE STATEMENT	
	• bilge water, grey water, black water and freshwater pumps • pump control systems (e.g. float switches) • battery motorised ventilation • solar systems • carbon monoxide gas alarm systems • low voltage charging stations • lighting (e.g. incandescent, fluorescent and LED)
Marine engines	Marine engines may include: • 2-stroke petrol • 4-stroke diesel and petrol
Vessels	Vessels may include: • single or multi-hull • inboard or outboard drive
Installation methods	Installation methods may include: • reading and interpreting wiring diagrams • soldering and crimping • installing components and wiring • adjustments and post-installation checks
Tooling and equipment	Tooling and equipment may include: • hand tools • testing equipment, including multimeters • power tools • air tools • specialist tools and equipment
Safe operating procedures	Safe operating procedures may include: • operational risk assessment and treatments • toxic substances • electrical safety • machinery movement and operation • manual and mechanical lifting and shifting • working in proximity to others
Information/documents	Information/documents may include: • verbal, written and graphical instructions issued by authorised internal and external persons

RANGE STATEMENT	
	• parts listing prices and catalogues • inventory systems • Repair Times manuals • material safety data sheets (MSDS) • diagrams or sketches • engineer's design specifications and instructions • manufacturer specifications • industry standards (e.g. American Boat and Yacht Council, National Marine, Manufacturer's Association and US Coast Guard) • Australian standards • workplace specifications and requirements • current driver's licence
Legislative requirements	Legislative requirements are to be in accordance with applicable commonwealth, state or territory legislation, regulations, certification requirements and codes of practice, and may include: • award and enterprise agreements • industrial relations • Australian standards • Australian Design Rules • confidentiality and privacy • WHS • the environment • equal opportunity • anti-discrimination • duty of care
WHS requirements	WHS requirements are to be in accordance with applicable commonwealth, state or territory legislation and regulations, and organisational safety policies and procedures, and may include: • personal protective equipment and clothing • safety equipment • first aid equipment • hazard and risk control • elimination of hazardous materials and substances • manual handling, including shifting, lifting

RANGE STATEMENT	
	and carrying • emergency procedures • road rules • safe driving policy
Environmental requirements	Environmental requirements may include: • waste management • noise • dust • clean-up management
Organisational policies and procedures	Organisational policies and procedures may include: • quality policies and procedures, including Australian standards • WHS, sustainability, environment, equal opportunity and anti-discrimination • manufacturer specifications and industry codes of practice • safe work procedures • reporting and recording procedures

Unit Sector(s)

Unit sector	Marine
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Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Engines
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