Australian Government

AURRTR3003 Test, diagnose and repair marine electronic systems and components

Release 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

AURRTR3003 Test, diagnose and repair marine electronic systems and components

Modification History

Release	Comment
Release 1	Replaces AURE321832A Test, diagnose and repair marine electronic 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 diagnose and repair marine electronic systems and components. It requires the ability to identify and confirm work requirements, prepare for, test, diagnose and repair marine low voltage electronic systems and components and complete work finalisation processes. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Application of the Unit

Application of the unit	This unit applies to individuals who undertake the repair of electronic systems and components in a marine environment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills	This unit contains employability skills.

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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for systems and component repair 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. Access and interpret test and repair methods, workshop manuals and manufacturer information 1.4. Check and prepare tools, measuring equipment and materials 1.5. Set up work area
2. Conduct system tests and analyse results	2.1. Develop a diagnosis strategy 2.2. Undertake system tests in accordance with workplace procedures and manufacturer and component supplier specifications 2.3. Compare test results with manufacturer and component supplier specifications to identify compliance or non-compliance 2.4. Document results, including evidence, relevant information and recommendations 2.5. Forward report to persons for action in accordance with workplace procedures 2.6. Finalise repair requirements
3. Dismantle systems and components	3.1. Dismantle electronic system and components in a logical sequence without causing damage 3.2. Clean and arrange components ready for inspection and testing 3.3. Measure and compare components against supplier specifications and tolerances 3.4. Decide repair method in accordance with WHS, environmental and industry regulations, and guidelines and enterprise procedures 3.5. Source parts, as required 3.6. Determine and arrange outsourcing of third-party repair
4. Repair, reassemble and reconnect systems and components	4.1. Perform repair and rebuild operations in accordance with workplace procedures and manufacturer and component supplier specifications and tolerances 4.2. Re-assemble electronic systems and components following manufacturer and component supplier procedures to industry standards

ELEMENT	PERFORMANCE CRITERIA
	4.3. Test systems for correct and safe operation and make required adjustments and re-test 4.4. Complete workplace documentation and deal with as relevant to repair outcomes
5. Prepare for delivery to customer	5.1. Determine the need for water testing 5.2. Make final inspection to ensure protective features are in place and according to workplace requirements 5.3. Finalise and process work completion documentation, update customer and warranty information and give to appropriate persons as required 5.4. Clean work area, dispose of waste 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 repair and testing of marine electronic systems and components, including use of specialist tooling, measuring equipment, use of communication devices and workplace technology, to record results of repair work
- communication skills to the level required to confirm work requirements 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, plans and safety procedures and sufficient to interpret technical information and specifications and to prepare reports
- numeracy skills to the level required to correctly calculate time, assess meter readings, apply accurate measurements, calculate electrical requirements and establish quality checks
- 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:

- operating principles, construction and types of marine related electronic systems and components
- test and repair procedures and methodologies for different electronic systems and components
- testing and adjustment procedures for different electronic systems and components types
- 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 repairing and testing electronic systems and components

REQUIRED SKILLS AND KNOWLEDGE
• organisational policies and procedures, including quality requirements, reporting and recording procedures related to repairing and testing electronic systems and components, WHS regulations and requirements, equipment, material and personal safety requirements

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 repair methods and techniques appropriate to the circumstances • complete preparatory activity in a systematic manner • repair and test a range of electronic systems and components to workplace and manufacturer and component supplier requirements, including GPS, depth sounders, fish finders, communications equipment, audiovisual equipment and radar • complete repair of electronic systems and components within workplace timeframes • complete workplace records.

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:
	  • appropriate worksite
	  • a range of electronic systems and components
	  • specifications and work instructions
	  • equipment, hand and power tooling appropriate to repairing marine engines
	  • relevant information, including manufacturer

EVIDENCE GUIDE	
	specifications.
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.	
Electronic systems and components	Electronic systems and components may include: • global positioning systems (GPS) • depth sounders • fish finders • communications equipment and radar

RANGE STATEMENT	
	• audiovisual equipment
Repair and test	Repair and test may include: • on- and off-site repairs • dismantling and reassembly • repair and replacement of components • testing and adjustments
Final inspection procedures	Final inspection procedures may include: • checking operation of electronic system or component • checking that covers are in place on equipment • cabling and wiring is securely fastened • transducers, antennas and receivers are positioned correctly
Tooling and equipment	Tooling and equipment may include: • specific service and general workshop equipment and tooling • measuring equipment • termination equipment • analogue and digital meters • crimping tools • soldering equipment
Materials	Materials may include: • spare parts • cable • terminations • cleaning materials
Environmental work practices	Environmental work practices may include: • use of renewable, recyclable, reusable and recoverable resources • minimisation and appropriate disposal of waste and packaging • prevention of contaminants and wastewater entering stormwater drains, waterways or marine environments • minimisation and containment of hazards to air quality • minimisation of noise generating activities • safe storage of parts and components

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	containing environmentally hazardous material • provision of appropriate storage or recycling containers for solid and liquid waste • use of impervious paved area for surface cleaning, engine degreasing and preparation • use of an approved parts washer • cleaning hands over drains connected to an oil/water separator or liquid waste collection drums • minimisation of exhausts and emissions and provision of ventilated work areas • use of a ventilated, enclosed booth or chamber for spray painting and abrasive sanding • recovering CFCs, HCFCs and blends from air conditioning systems for recycling or approved disposal • prevention of tributyltin, arsenic, mercury and DDT entering the marine environment
Information and documents	Information and documents may include: • verbal, written and graphical instructions issued by authorised internal and external persons • 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 codes of practice • industry standards (e.g. American Boat and Yacht Council, National Marine, Manufacturer's Association and US Coast Guard) • Australian standards • workplace specifications and requirements
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:

RANGE STATEMENT	
	• 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 and carrying • emergency procedures
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

Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Electrical and Electronic