



Australian Government

UEERS0001 Assemble and wire internal electrical rail signalling equipment

Release: 1

UEERS0001 Assemble and wire internal electrical rail signalling equipment

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to assemble and wire internal rail signalling equipment for location boxes, enclosures and equipment rooms.

It includes following workplace procedures, assembling and mounting components, performing internal wiring, terminating cables, and wiring and testing to certify equipment.

Persons achieving competence in this unit will need to fulfil the applicable state/territory legislated rail safety requirements and to comply with relevant codes of practice, rules and/or guidelines.

No other licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

UEEEL0003 Arrange circuits, control and protection for general electrical installations

Competency Field

Rail Signalling

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to assemble and wire internal signalling

PERFORMANCE CRITERIA

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

1.1 Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures

equipment	for work area are identified and applied
	1.2 Hazards are identified, risks assessed, and control measures and workplace procedures are implemented
	1.3 Safety hazards that have not previously been identified are noted on the job safety assessments and existing risk control measures implemented
	1.4 Technical requirements relating to specific signalling equipment are obtained
	1.5 Assembly and wiring are appropriately sequenced in accordance with job schedule
	1.6 Appropriate person/s is consulted to ensure work is coordinated effectively with others involved on the worksite
	1.7 Materials needed for assembly and wiring are obtained in accordance with workplace procedures and checked against job requirements
	1.8 Tools, equipment, and testing devices needed to assemble and wire equipment are obtained in accordance with workplace procedures and checked for correct operation and safety
	1.9 Rail signalling equipment is prepared for assembly and wiring in accordance with workplace procedures and relevant specifications
2 Assemble and wire internal signalling equipment	2.1 WHS/OHS risk control measures and workplace procedures for carrying out the work are followed
	2.2 Equipment is assembled, wired, connected and labelled to comply with technical standards and job specification requirements
	2.3 Risk control measures for dealing with unplanned situations are discussed with appropriate person/s and documented in job safety assessments
	2.4 Unplanned situations are dealt with safely in a manner that minimises risk to personnel and equipment and with the approval of authorised person/s
	2.5 Equipment is assembled, wired, connected and labelled efficiently without waste of materials or damage to

		apparatus, the surrounding environment or services using sustainable energy practices
3 Complete assembly and wiring of internal signalling equipment	3.1	WHS/OHS work completion risk control measures and workplace procedures are followed
	3.2	Terminations are tested in accordance with workplace testing procedures to ensure tightness and functionality
	3.3	Continuity and insulation tests are carried out in accordance with workplace test procedures to ensure and verify system standards are met
	3.4	Wiring diagrams, quality requirements and safety issues are addressed and relevant reports/documentation are updated and completed in accordance with workplace 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.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UEENEEN102A Assemble and wire internal electrical rail signalling equipment.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEERS0001 Assemble and wire internal electrical rail signalling equipment

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 relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including risk control measures
- applying relevant rail signalling regulations and codes
- applying relevant technical manuals and catalogues to workplace practices
- applying sustainable energy principles and practices
- assembling and wiring equipment to specified/technical workplace requirements
- completing the assembly and wiring of internal signalling equipment
- completing mandatory reporting
- completing relevant technical reports, records and documentation
- conducting mandatory tests and identifying non-conformance using effective workplace methods
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- ensuring assembled/wired equipment operates to specifications
- following correct testing procedures
- following relevant codes of practice, WHS/OHS and environmental protection procedures and requirements
- interpreting signalling circuit diagrams
- interpreting specifications correctly
- preparing to assemble and wire internal signalling equipment
- using appropriate tools correctly and safely.

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 safe working practices and workplace procedures
- faults in inverters

- features and characteristic of inverters under load and no-load characteristics - circuit configuration, input and output wave forms, relationship between input and output voltages and output voltage under load conditions
- hazards associated with low voltage (LV), extra-low voltage (ELV) and high currents, including:
 - arrangement of power distribution and circuits in an electrical installation
 - parts of an electrical system and equipment that operate at LV and ELV
 - parts of an electrical system and equipment where high currents are likely
- linear and switch mode power supplies, including:
 - direct current (d.c.) to d.c. converters
 - diagnostic procedures to isolate faults
 - isolation requirements and circuitry
 - characteristics of switched mode power supplies
 - operation of step-down and step-up regulators, variable frequency and pulse width modulated regulation techniques, and switched mode power supplies
 - radiation suppression circuitry
- mechanical rail signalling principles, including:
 - overview and purpose of elements - signals, point actuating systems, locking and train detection systems, control input devices, indicators, diagrams and monitors, interlocking and safe working systems
- mechanical rail signalling equipment including:
 - equipment and their components, operating principles and servicing procedures
- optical fibre safety, including:
 - coherent optical sources and joining procedures
 - laser safety class 3a devices or equivalent
- rail signalling, drawings and diagrams, including layouts, conventions and symbols
- rail signalling and electro-pneumatic equipment, including operating principles and parameters, and servicing procedures
- relevant cable and equipment schedules
- relevant job safety assessments/risk mitigation processes
- relevant principles and purposes of risk management
- relevant processes for conducting a risk assessment
- relevant manufacturer specifications
- relevant rail safe working practices, protection and management
- relevant rail signalling, regulations and codes of practice
- relevant WHS/OHS legislated requirements
- relevant workplace documentation, manuals and catalogues
- relevant workplace policies and procedures
- risks and control measures associated with harmful dusts and airborne contaminants - thermal insulation, fibrous cement materials and asbestos, and other fibre reinforced switchboard materials
- risks and control measures associated with LV, including:

- control measures before, during and after working on electrical installations, circuits or equipment
- control measures for working live
- isolation and tagging-off procedures
- risks and restrictions in working live
- risks associated with modifying electrical installations, fault finding, maintenance and repair
- risks and control measures associated with high voltage (HV), including:
 - parts of an electrical system and equipment that operate at HV
 - terms ‘touch voltage’, ‘step voltage’, ‘induced voltage’ and ‘creepage’ as they relate to the hazards of HV, and control measures used for dealing with the hazards of HV
- safety, selection, use, maintenance and care of test equipment, including:
 - checks and storage methods for maintaining the safety of testing devices
 - safety characteristics and safe use of electrical testing devices
- typical applications of inverters.

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 must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated suitable workplace operational situations that replicate 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:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, facilities, equipment and personal protective equipment (PPE) currently used in industry
- relay, racks/frames/enclosures, switch circuit controllers, telephone technology and vital computer-based interlocking modules
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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