



Australian Government

UEERS0019 Test copper rail signalling cables

Release: 1

UEERS0019 Test copper rail signalling cables

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 test signal and communication copper cables.

It includes following workplace procedures, determining tools required, setting up and conducting tests, interpreting test results, determining activities to maintain system integrity and reporting activities.

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

UEERS0017 Repair rail signalling power and control cables

Competency Field

Rail Signalling

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to inspect and test rail signalling cable

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

for work area are identified, obtained and applied

- 1.2** Hazards are identified, risks assessed, and control measures and workplace procedures 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** Access times and work methods are confirmed to comply with customer requirements and relevant rail safety legislation
- 1.5** Rail service access is checked prior to testing and signalling cable is isolated/disconnected from rail network/equipment to ensure no equipment damage can occur during testing
- 1.6** Required inspection, test procedures and purpose are identified from site, client, workplace documentation and manufacturer specifications
- 1.7** Tools and testing devices needed for cable testing are obtained in accordance with workplace procedures and checked for correct operation and safety
- 1.8** Testing devices calibration certification is checked and current in accordance with manufacturer specifications

2 Inspect and test rail signal cables

- 2.1** Work area and rail cable system is made safe for testing in accordance with WHS/OHS risk control measures and workplace procedures
- 2.2** Rail signal cables are inspected in accordance with workplace procedures and relevant specifications
- 2.3** Tests are set up and performed in accordance with safety risk control measures and manufacturer specifications
- 2.4** Test results are read accurately and compared against manufacturer and site specifications for rail cable performance
- 2.5** Existing methods for dealing with unplanned situations are dealt with safely in a manner that minimises risk to personnel and equipment and with the approval of an authorised person/s
- 2.6** Testing is performed efficiently without waste of materials or damage to apparatus, the surrounding

environment or services in accordance with sustainable energy practices

- 2.7 Available services are connected and tested for functionality to ensure all previous services have been resumed

3 Report test results

- 3.1 WHS/OHS work completion risk control measures and workplace procedures are followed
- 3.2 Recommendations and required actions to maintain cable system integrity resulting from cable tests are reported and documented
- 3.3 Results of tests are documented accurately and in a timely manner to ensure test results remain current
- 3.4 Site and installation records are updated to ensure traceability of system information performance is maintained 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.

Identifying and testing of copper rail signalling cables must include the following:

- five non-compliant test results

Unit Mapping Information

This unit replaces and is equivalent to UEENEEN104A Test copper rail signalling cables.

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 UEERS0019 Test copper rail signalling cables

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, performance criteria and range of conditions 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 sustainable energy principles and practices
- performing copper rail signalling cable tests, including:
 - checking that technical/operational specifications are met and that cables comply with specifications
 - completing relevant technical reports, records and documentation
 - confirming the integrity of a cable system
 - dealing with unplanned events
 - following relevant codes of practice, procedures and requirements
 - interpreting plans and specifications correctly
 - testing cable in accordance with workplace procedures
 - using test equipment and tools correctly and safely
- preparing to test rail signalling cable
- reporting test results
- testing rail signal cables.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- performance parameters associated with copper cables and coaxial cables, including:
 - attenuation
 - attenuation to cross talk ratio (ACR)
 - characteristic impedance
 - insulation resistance (leakage)

- loop resistance
- near end cross talk (NEXT)
- noise (impulse noise and average noise)
- open circuit, short circuit and pair continuity
- return loss
- split pair and crossed pair
- rail signalling cable testing techniques
- relevant industry standards and requirements relating to results for compliance for structured copper and coaxial cables, including:
 - operation of test equipment for correct evaluation of specific cable performance parameters and to obtain accurate and reliable results
 - test equipment and leads needed to evaluate a given performance parameter
 - tests required to evaluate a given performance parameter
 - transmission performance requirements
 - typical/common causes of non-compliant test results
- relevant manufacturer specifications
- relevant job safety assessments or risk mitigation processes
- relevant WHS/OHS legislated requirements
- relevant workplace documentation, including:
 - methods for recording and maintaining work records
 - purpose, and extent for maintaining work activities records
 - records required by regulation/regulator
 - types of records for maintaining work activities
- relevant workplace policies and procedures
- structured cabling, including:
 - higher performance cabling
 - shielded twisted pair (STP)
 - twisted pair cabling
 - unshielded twisted pair (UTP)
- sustainable energy principles and 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 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
- resources that reflect current industry practices in relation to testing copper rail signalling cables
- applicable documentation, including policy and workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

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