



Australian Government

UETTD RRT34 Install and maintain traction network wiring systems

Release: 1

UETTDRT34 Install and maintain traction network wiring systems

Modification History

Release 1. This is the first release of this unit of competency in the UET Transmission, Distribution and Rail Sector Training Package.

Application

This unit covers the installation and maintenance of overhead traction wiring systems to ensure proper installation, in particular, the correct registration of the contact wire with respect to the current collectors.

It includes the undertaking of safe working practices on or about the running line/track and the preparation needed for stringing and profiling, including the isolation of systems and circuits for safe working according to work plans, the diagnosis of faults and the modification and re-adjustment to appropriate standards.

It also encompasses the correct positioning of road signs, barriers and/or warning devices, and the procedure of issuing/accepting electrical permits. It also includes the visual and other necessary checks to confirm that equipment and associated hardware have been correctly installed according to design and are in a safe condition to undertake pre-commissioning tests prior to putting into service and updating installation and maintenance data, such as as-built drawings and relevant quality assurance documentation.

The application of the skills and knowledge described in this unit requires a licence/registration to practice in the workplace subject to regulations for undertaking of electrical work.

Other conditions may apply under state and territory legislative and regulatory licencing requirements which must be confirmed prior to commencing this unit.

Pre-requisite Unit

Common Unit Group

UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace

UEENEEE102A Fabricate, assemble and dismantle utilities industry components

UEENEEE104A Solve problems in d.c. circuits

UEENEEE105A Fix and secure electrotechnology equipment

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEE137A Document and apply measures to control OHS risks associated with electrotechnology work

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG033A Solve problems in single and three phase low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage a.c. circuits

UEENEEG103A Install low voltage wiring and accessories

UEENEEG104A Install appliances, switchgear and associated accessories for low voltage electrical installations

UEENEEG105A Verify compliance and functionality of low voltage general electrical installations

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

UEENEEG107A Select wiring systems and cables for low voltage general electrical installations

UEENEEG108A Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

UEENEEG109A Develop and connect electrical control circuits

UEENEEK142A Apply environmentally and sustainable procedures in the energy sector

UETTDREL16 Working safely near live electrical apparatus

UETTDNIS62 Implement and monitor the power system organisational WHS/OHS policies, procedures and programs

UETTDNIS63 Implement & monitor power system environmental & sustainable energy management policies & procedures

UETTDNIS67 Solve problems in energy supply network equipment

Competency Field

Rail Traction

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

PERFORMANCE CRITERIA

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

- 1 Prepare/plan to install and maintain traction network wiring systems**
- 1.1** Work schedules, including drawings, plans, requirements, established procedures and material lists, are received, analysed and confirmed, as necessary, by site inspection
 - 1.2** Relevant requirements and established procedures for the work are communicated to all personnel and identified for all worksites
 - 1.3** Work health and safety (WHS)/occupational health and safety (OHS) policies and procedures related to requirements and established procedures for the installation and maintenance of traction network wiring systems are obtained and confirmed for the purposes of the work to be performed and communicated to relevant personnel
 - 1.4** Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures
 - 1.5** Hazards are identified, WHS/OHS risks assessed and control measures are prioritised, implemented and monitored, including emergency exits kept clear, according to established procedures
 - 1.6** Relevant work permits are obtained to access and perform work according to requirements and/or established procedures
 - 1.7** Resources, including personnel, equipment, tools and personal protective equipment (PPE), required for the job are obtained and confirmed in working order
 - 1.8** Relevant personnel at worksite are confirmed current in cardiopulmonary resuscitation (CPR), first aid, other rescue procedures and related work procedures according to requirements
 - 1.9** Liaison and communication issues with others/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary
 - 1.10** Site is prepared according to the work schedule and to minimise risk and damage to property, commerce and individuals in accordance with established procedures
 - 1.11** Personnel participating in the work, including plant

operators and contractors, are fully briefed and respective responsibilities confirmed, where applicable, in accordance with established procedures

1.12 Rail/road signs, barriers and warning devices are positioned in accordance with requirements

1.13 Environmental constraints applicable to work are identified and control measures applied

2 Carry out the installation and maintenance of traction network wiring systems

2.1 WHS/OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures

2.2 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and currency according to requirements confirmed

2.3 Systems and circuits are isolated, as required, proved safe to work on in accordance with the requirements/permits and established procedures

2.4 Essential knowledge and associated skills are applied in the safe installation and maintenance of traction network wiring systems to ensure completion in an agreed timeframe and to quality standards with a minimum of waste according to requirements

2.5 Overhead traction wiring systems, including cables, fittings, traction conductors and associated equipment, are installed according to design, work schedule requirements and established procedures

2.6 Maintenance, including repair and/or replacement of overhead traction wiring systems, including the modification and re-adjustment of overhead traction conductors is carried out in accordance with the work schedule and requirements/established procedures

2.7 Profiling is completed according to established procedures

2.8 Hazard warnings and safety signs are recognised and hazards and assessed WHS/OHS risks are reported to immediate authorised personnel for directions according to established procedures

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| | 2.9 | Unplanned events in the installation and maintenance of traction network wiring systems are undertaken within the scope of established procedures |
| | 2.10 | Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills |
| | 2.11 | Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures |
| 3 Complete the installation and maintenance of traction network wiring systems | 3.1 | Work undertaken is checked against design drawings and work schedule for conformance with requirements and anomalies reported in accordance with established procedures |
| | 3.2 | Accidents and/or injuries are reported in accordance with requirements/established procedures, where applicable |
| | 3.3 | Worksite is rehabilitated, cleaned up and made safe in accordance with established procedures |
| | 3.4 | Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures |
| | 3.5 | Relevant work permits are signed off and the overhead traction network wiring system is returned to service in accordance with requirements |
| | 3.6 | Works completion records, reports, as installed/modified drawings and/or documentation and information are finalised and processed and appropriate personnel notified |

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 Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UETTDRT34A Install and maintain traction network wiring systems.

Links

UET Training Package Companion Volume Implementation Guide is found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=229bace1-b7bc-4653-9300-dffb13ecfad7>

Assessment Requirements for UETTDRT34 Install and maintain traction network wiring systems

Modification History

Release 1. This is the first release of this unit of competency in the UET Transmission, Distribution and Rail Sector Training Package.

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 the use of risk control measures
- applying sustainable energy principles and practices
- installing and maintaining at least four (4) of the following:
 - support structure
 - span
 - section insulator
 - neutral section
 - midpoint anchor
 - support equipment
 - tension regulators
 - stay/guy wire
 - tramway support network
- installations must incorporate at least two (2) of the following:
 - catenary
 - dropper
 - contact/trolley*
 - feeder
 - earth conductor
 - drape/potential jumper
 - (*must do)
- performing work from at least one (1) of the following:
 - elevated work platform (EWP)
 - ladder
 - mobile platform
- installations must also incorporate at least two (2) of the following:
 - tensioning equipment*

- specialised tools
- ropes
- geometry profiling equipment
- (*must do)
- dealing with unplanned events on at least one (1) occasion.

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:

- standards, codes, legislation, supply authority regulations and/or enterprise requirements applicable to the electrical traction
- electrical traction voltage and current circuit paths encompassing:
 - transmission distribution voltages
 - traction supply system and voltages
 - return and stay current paths, including electrolysis
- relationship of sectioning, section insulator and overlaps/air gaps in a traction power system
- traction power system components encompassing:
 - function of transformer/rectifiers
 - configuration and purpose of traction overhead wiring systems
 - function of isolators/switches
 - function of the circuit breaker
- reliability and security of traction supply
- traction power system electrical protection encompassing:
 - load protection
 - surge protection
 - fault protection
 - electrolytic protection
- impact of electromagnetic forces encompassing:
 - telephone interference
 - effects of television/radio interference
- insulation methods in a traction power system encompassing:
 - types of electrical insulation
 - insulation coordination
 - reason for electrical clearances
- bonding systems - structure bonds, traction bonds/bonding cables and impedance bonds
- ancillary conductors - feeder wires, current return path and other ancillary conductors
- relationship of current and potential drapers/jumpers to the traction power system
- electrical wiring system components - earth wires, feeder wire, return conductor, insulators, catenary wire, contact/trolley wire, droppers, tensioning equipment, current collectors, tram support networks, tram fittings and bridge/tunnel fittings

- electrical traction circuits encompassing:
 - types
 - applications
- relationship of the components, apparatus and the conductors to the operation of the traction system
- effective current collection and wire interface
- effective registration in the traction power system
- profiling overhead traction wire methods
 - factors that impact on current collectors
 - methods to achieving smooth current collector transitions and interfaces
- dynamic and static forces encompassing:
 - types that effect traction systems
 - effects on effective registration
 - techniques to minimise the adverse effects.

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 workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated conditions involving realistic and authentic activities that replicate operational 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, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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