



Australian Government

**UETDRTO009 Install/maintain
transmission network infrastructure
electrical equipment**

Release: 1

UETDRTO009 Install/maintain transmission network infrastructure electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UET Transmission, Distribution and Rail Sector Training Package Release 2.0.

Application

This unit covers the maintenance of non-energised, pyramid, delta, Pi or enterprise-specific transmission towers and associated hardware and the inspection requirements of overhead structures, such as towers and electrical apparatus. Overhead structures include towers and overhead conductors and/or cables, including underground and overhead transition points, electrical equipment, hardware and/or earthing systems.

This unit encompasses the repair and/or replacement of components in accordance with construction plans, specifications, work orders and standing enterprise requirements. Maintenance also involves cleaning and welding. The updating of system data, records and/or completion of relevant documentation in accordance with enterprise requirements also forms part of this competency.

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 licensing requirements which must be confirmed prior to commencing this unit.

Pre-requisite Unit

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

UETDREL005 Work safely in the vicinity of live electrical apparatus

UETDRIS005 Implement & monitor power system environmental & sustainable energy management policies & procedures

UETDRIS006 Implement and monitor the power system organisational WHS/OHS policies, procedures and programs

UETDRTO008 Install/maintain overhead transmission network infrastructure

UETTDRI67 Solve problems in energy supply network equipment

Competency Field

Transmission Overhead

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare/plan to install and maintain transmission network infrastructure electrical equipment

PERFORMANCE CRITERIA

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

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 transmission network infrastructure electrical equipment 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 prioritised, implemented and monitored, including emergency exits kept clear, according to established procedures
- 1.6** Resources, including personnel, equipment, tools and personal protective equipment (PPE), required for the job are obtained and confirmed in working order
- 1.7** Relevant work permits are obtained to access and perform work according to requirements and/or established procedures
- 1.8** Relevant personnel at worksite are confirmed current in first aid, tower/pole top rescue and other related work procedures according to requirements
- 1.9** Liaison and communication issues with others/authorised personnel, authorities, clients and landowners 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** Traffic management plan is identified and implemented

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| 2 Carry out the installation and maintenance of transmission network infrastructure electrical equipment | <p>2.1 WHS/OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures</p> <p>2.2 Towers and associated hardware to be erected are stabilised according to requirements</p> <p>2.3 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and currency according to requirements confirmed</p> <p>2.4 Essential knowledge and associated skills are applied in the safe installation and maintenance of transmission network infrastructure electrical equipment to ensure completion in an agreed timeframe and to quality standards with a minimum of waste according to requirements</p> <p>2.5 Hazard warnings and safety signs are recognised and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures</p> <p>2.6 Inspection of overhead structures and electrical apparatus used on towers is carried out in accordance with the work schedule and requirements/established procedures</p> <p>2.7 Maintenance, including repair and/or replacement of towers, is carried out in accordance with the work schedule and requirements/established procedures</p> <p>2.8 Unplanned events in the erection of towers and associated hardware are undertaken within the scope of established procedures</p> <p>2.9 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills</p> <p>2.10 Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures</p> |
| 3 Complete the installation and maintenance of transmission network infrastructure electrical | <p>3.1 Work undertaken is checked against work schedule for conformance with requirements and anomalies reported in accordance with established procedures</p> |

equipment

- 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 or disposed of in accordance with established procedures
- 3.5** Relevant work permits are signed off and towers and associated hardware are returned to service in accordance with requirements
- 3.6** Work 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 UET Transmission, Distribution and Rail Sector Training Package Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UETTDRTTP35 Install/maintain transmission network infrastructure electrical equipment.

Links

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

Assessment Requirements for UETDRT0009 Install/maintain transmission network infrastructure electrical equipment

Modification History

Release 1. This is the first release of this unit of competency in the UET Transmission, Distribution and Rail Sector Training Package Release 2.0.

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
- maintaining one (1) of the following types of towers:
 - pyramid
 - delta pi
 - enterprise-specific type
- incorporating at least two (2) of the following:
 - insulators
 - clamps
 - bolts
 - structural components
- incorporating at least one (1) of the following maintenance tasks:
 - welding
 - cleaning
- inspecting at least four (4) of the following:
 - towers
 - overhead conductors/cables
 - structural fittings
 - electrical equipment
 - hardware
 - earthing systems
- incorporating at least two (2) of the following:
 - visual*
 - infra-red camera
 - X-ray
 - camera

- binoculars/telescope
- (* must do)
- incorporating all the following:
 - reporting procedures
 - reporting outcomes
- 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:

- procedures for routine maintenance on transmission structures and hardware encompassing:
 - procedures for gaining access permits
 - reasons for gaining access
 - types of maintenance procedures on transmission structures - procedure to follow for inspection/patrols according to the transmission supply authority
 - erecting and removing of transmission equipment and hardware from a tower - climbing procedures, square rigging principles, calculation of forces at work within a given square rigging system and construction of a square rigging system
 - procedures for changing insulators - vertical angle suspension, strain insulator, post insulator (horizontal or vertical) and bridge insulator, and calculation of conductor forces
 - installation of temporary work platforms - types and function of installation tools and equipment, precautions and work methods to follow, and procedures for installations of temporary work platforms
 - installation of conductor protective hardware - types and selection of common dampers, tools and equipment; control of Aeolian vibration and procedures for the installation of dampers onto conductors
 - dead line insulator washing - supply authority regulations, and procedures for washing de-energised transmission lines
- inspection of towers and structures used for transmission lines encompassing:
 - standards, codes, legislation, supply authority regulations and/or enterprise requirements
 - characteristics of materials used for towers structures within the electrical transmission system - faults that occur that influence the integrity of the structure
 - deterioration prevention techniques - relationship between steel and other materials, inspection procedures for deterioration and deterioration prevention procedures in steel
 - procedures for the repair of deterioration in steel
- inspection of transmission lines encompassing:
 - standards, codes, legislation, supply authority regulations and/or enterprise requirements
 - clearances and safety procedures
 - ground line inspection procedures of electrical transmission lines - requirements for inspection of transmission lines and insulators, use of specific equipment and testing devices during testing/inspection, techniques in transmission line inspection and methods

- of recording data
- overhead line inspection procedures of electrical transmission lines - methods and requirements for overhead line inspection on electrical structures, clearances for overhead conductors, cables and structures, techniques used to obtain close inspection of transmission lines, and use of specific equipment and testing devices during testing/inspection
- methods of recording data
- powerline safety practices encompassing:
 - protective apparatus and apparel for linework - responsibilities for the selection, use, maintenance and storage of protective apparatus and apparel and the types of protective apparatus and apparel used for the line worker
 - requirements for the use of ladders - carrying, erecting, collapsing and lowering different types of extension ladder against a standing pole; maintenance checks on different types of ladders; renewal of extension ropes and the safety issues relating to clearances from overhead conductors
 - requirements for climbing and working aloft - methods used to identify a pole is safe to climb; methods used to inspect a line worker's body belt; application of knots and hitches appropriate to the requirements of a line worker; height safety principles, including personal fall protection, prevention and related requirements; and the practical procedures of climbing an overhead structure and fitting a pole chair
 - traffic management - purpose of traffic management and a line worker's responsibilities in accordance with relevant statutory requirements and electricity supply industry (ESI) requirements, procedures used to provide an effective traffic management scheme and the use of a two-way radio
 - control of small fires - identification, selection and operation of the appropriate extinguishing mediums for various types of fires, general fire prevention methods and the precautions for personal protection when fighting small fires
 - rescue victims from heights and confined spaces - planning and identifying procedures; establishing responses; developing techniques; involvement of external emergency services; and practical demonstration/rehearsals of rescuing a person from heights and from confined spaces and emergency procedures for the rescue of an electric shock victim, including cardiopulmonary resuscitation (CPR)
 - requirements for aerial linework - planning, establishing and implementing relevant aviation authority clearances; determining system requirements; aircrew familiarisation with network operations and equipment; and requirements for effective communications operations for aerial work.

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.

Links

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