



Australian Government

UETDRDO002 Inspect, maintain and restore energised low voltage overhead distribution network infrastructure

Release: 1

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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 inspection of overhead structures, such as poles and/or other structures other than towers, and the maintenance of overhead energised low voltage (LV) conductors and cables. It includes the conducting of LV switching operations involving the operation of circuit breaking and isolation devices from a given switching schedule in accordance with enterprise procedures. It covers LV distribution systems in field situations but also includes paralleling in accordance with the switching schedule.

It also includes inspection of electrical apparatus, such as overhead conductors and/or cables, underground and overhead transition points, electrical equipment, such as pole-mounted transformers, switchgear, hardware and/or earthing systems. It encompasses the completion of inspection reports and other relevant documentation in accordance with requirements.

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

UETDRIS009 Install and maintain ESI network infrastructure electrical equipment

UETTDRI67 Solve problems in energy supply network equipment

Competency Field

Distribution Overhead

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare for the inspection, maintenance and restoration of overhead distribution network

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

infrastructure

- 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 inspection of overhead structures and electrical apparatus used on poles and/or structures, the maintenance of overhead energised LV conductors and cables and LV switching, are obtained and confirmed for the purposes of the work to be performed and communicated
- 1.4** Physical loads and calculations are confirmed according to requirements using essential knowledge and appropriate skill
- 1.5** Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures
- 1.6** Hazards are identified, WHS/OHS risks assessed and control measures prioritised, implemented and monitored, including emergency exits kept clear according to established procedures
- 1.7** Relevant work permits are obtained to access and perform work according to requirements and/or established procedures
- 1.8** Resources, including personnel, equipment, tools and personal protective equipment (PPE), required for the job are obtained and confirmed in working order
- 1.9** Specialist equipment for live work is inspected and confirmed in working order in accordance with requirements and established procedures
- 1.10** Relevant personnel at worksite are confirmed current in first aid, pole top rescue and other related work procedures according to requirements
- 1.11** Liaison and communication issues with other/authorised personnel, authorities, clients and landowners are resolved to carry out work where necessary

- 1.12 Site is prepared according to the work schedule and to minimise risk and damage to property, commerce and individuals in accordance with established procedures
 - 1.13 Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed, where applicable, in accordance with established procedures
 - 1.14 Traffic management plan is identified and implemented
- 2 **Carry out inspection, maintenance and restoration of overhead distribution network infrastructure**
 - 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
 - 2.2 Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely followed, and currency according to requirements is confirmed
 - 2.3 Essential knowledge and associated skills are applied in the safe maintenance and restoration of overhead distribution network infrastructure to ensure completion in an agreed timeframe and to quality standards with a minimum of waste according to requirements
 - 2.4 Inspection of overhead structures and electrical apparatus used on poles and/or structures is carried out in accordance with the work schedule and requirements/established procedures
 - 2.5 Maintenance, including repair and/or replacement of poles and/or structures, is carried out in accordance with the work schedule and requirements/established procedures
 - 2.6 Communications with Switching Control Officer are established and maintained throughout the isolation operation according to established procedures
 - 2.7 Electrical equipment and associated circuits line/network or worksite to be switched, including paralleling, is isolated and proved de-energised using appropriate devices and earthed, where required, according to requirements and established procedures
 - 2.8 Hazard warnings and safety signs are recognised and

- hazards and assessed WHS/OHS risks are reported to the immediate authorised persons for directions according to established procedures
- 2.9** Unplanned events during the inspection, maintenance or switching procedures 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 inspection, maintenance and restoration of overhead distribution network infrastructure**
- 3.1** Work undertaken is checked against works 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 or disposed of in accordance with established procedures
- 3.5** Relevant work permits are signed off and overhead structures and electrical apparatus used on poles and/or structures are returned to service in accordance with requirements
- 3.6** Work completion records, reports, as installed/modified drawing 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 UETTD RDP15 Inspect, maintain and restore energised low voltage overhead distribution network infrastructure.

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 UETDRDO002 Inspect, maintain and restore energised low voltage overhead distribution network infrastructure

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
- inspecting three (3) of the following overhead structures and electrical apparatus:
 - poles and structures
 - overhead conductors/cables
 - underground/overhead transition points
 - electrical equipment
 - hardware
 - earthing systems
- conducting inspections using at least one (1) of the following:
 - ground
 - vehicle
 - helicopter
 - fixed wing
- using at least two (2) of the following inspection techniques:
 - visual*
 - infra-red camera
 - X-ray
 - camera
 - (*must do)
- maintaining at least two (2) of the following overhead energised low voltage (LV) conductors and cables:
 - copper
 - aluminium
 - aluminium steel

- steel
- pilot
- using at least two (2) of the following access equipment:
 - elevated work platform (EWP)
 - ladder
 - portable platform
- using all of the following live LV working equipment:
 - insulating mats/sleeves
 - temporary bridging device
 - insulating gloves
 - insulated cable tensioning devices
 - ladder/pole shrouds
 - equipotential bonding
- using at least three (3) of the following testing and recording devices:
 - voltage detector*
 - clamp-on ammeter
 - polarity tester
 - insulation resistance tester
 - phase sequence indicator
 - recording meters
 - (*must do)
- performing LV switching to a given schedule and incorporating all of the following:
 - approvals/clearances
 - access authority/permits
- incorporating two (2) of the following:
 - voltage detectors
 - polarities testers
 - phase rotation indicators
- operating at least one (1) of the following switchgear types:
 - LV links
 - LV bridges
 - LV fuses
- 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:

- powerline safety practices encompassing:
 - protective apparatus and apparel for linework:

- responsibilities for the selection, use, maintenance and storage of protective apparatus and apparel
- 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 ladders against a standing pole
 - maintenance checks on different types of ladders
 - renewal of extension ropes
 - 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
 - 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 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
 - precautions for personal protection when fighting small fires
- rescue victims from heights and confined spaces:
 - planning, identifying and establishing procedures and responses
 - developing techniques
 - involvement of external emergency services
 - 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
 - requirements for effective communications operations for aerial work
- LV - energised LV equipment working practices for substations encompassing:
 - standards, codes, Commonwealth, state/territory/local government legislation, supply authority regulations and/or enterprise requirements
 - safety precautions specific to working on or near energised LV conductors:

- safe working practices and procedures
- identification of hazards
- assessment and control of WHS/OHS risks
- types, selection, maintenance and use of personal protective equipment (PPE)
- work on or near energised LV conductors:
 - types and function of specialised tools
 - safe working practices when using specialised tools
 - methods of using specialised tools
 - safe procedures for work on panels and in cubicles on or near energised LV conductors
 - release and rescue procedures for work on or near exposed energised LV conductors
- poles and structures inspection principles encompassing:
 - standards, codes, legislation, supply authority regulations and or enterprise requirements
 - characteristics of wood used for structures within the electrical distribution system:
 - relationship between timber and water
 - faults that occur that influence the integrity of the structure
 - effects of fungal activity, termite and borer activity and dry rot
 - chemical treatment principles:
 - types of chemical used to treat timber
 - regulations and procedures in handling and transporting chemicals safely
 - application procedures of chemicals to wood
 - deterioration prevention techniques:
 - relationship between steel, concrete and wood
 - inspection procedures for deterioration
 - deterioration prevention procedures in steel, concrete and wood
 - procedures for the repair of deterioration in steel, concrete and wood
- powerline inspection principles encompassing:
 - standards, codes, legislation, supply authority regulations and or enterprise requirements
 - ground line inspection procedures of electrical distribution structures:
 - requirements for pole inspection on electrical distribution structures
 - use of specific equipment and testing devices during testing/inspection
 - methods of recording data
 - overhead line inspection procedures of electrical distribution structures:
 - methods and requirements for overhead line inspection on electrical distribution structures
 - clearances for overhead conductors, cables and structures
 - use of specific equipment and testing devices during testing/inspection
 - methods of recording data
 - underground cable inspection procedures in the electrical distribution system:
 - state/territory industry policy and regulations

- methods and requirements for line inspection on underground cable terminations
- installation of switchgear and associated equipment encompassing:
 - types and function of various switchgear:
 - isolators, air-break switches, gas-filled switches, vacuum type, links, fuses, oil disconnectors, fuse switches and circuit breakers
 - operating characteristics, advantages and disadvantages of different types of switchgear
 - installation procedures, earthing requirements and techniques
 - types of equipment:
 - transformers, reactors, regulators, capacitors, relays, surge arrestors, fault indicators and mobile generators
 - installation procedures for switchgear and equipment:
 - standards, codes, legislation, supply authority regulations and/or enterprise requirements
 - assembly and erecting procedures
 - earthing requirements and techniques
 - pole mounted locations
 - maintenance procedures for switchgear and equipment:
 - diagnosing and rectifying faults according to electricity supply industry (ESI) standards and procedures
 - testing and commissioning:
 - ESI standards and procedures
- LV switching principles encompassing:
 - standards, codes, legislation, supply authority regulations and/or enterprise requirements applicable to switching of LV to a given schedule
 - requirements for the use of manuals, system diagrams/plans and drawings:
 - types, characteristics and capabilities of electrical apparatus
 - use, characteristics and capabilities of specialised tools and testing equipment
 - LV network interconnectors source of possible backfeed
 - LV switching techniques:
 - identifying hazards, assessing and controlling risks associated with LV switching operations, electrical access permit(s), operational procedures, earthing procedures
 - PPE for LV switching.

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 PPE currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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