



Australian Government

UETDRDU004 Install and maintain network infrastructure HV underground cables

Release: 1

UETDRDU004 Install and maintain network infrastructure HV underground cables

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 installation and maintenance of de-energised high voltage (HV) underground cables and covers the laying of cables as well as the jointing, terminating, repair and replacement of cables. It includes direct laying of cables in trenches, on racks, in troughs and/or in conduit or ducts, and the isolation of systems and circuits, the procedure of issuing/accepting electrical access permits, the undertaking of pre-commissioning and/or recommissioning tests and the updating of system data/maintenance records.

The application of the skills and knowledge described in this unit may require 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

UETDRDU005 Install and maintain network infrastructure LV underground cables

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

Competency Field

Distribution Underground

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare the laying, installation and maintenance of de-energised HV underground cables

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 laying, installing and maintenance of HV underground cables 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** 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 first aid 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** Road signs, barriers and warning devices are positioned in accordance with requirements

2 Carry out the laying, installation and

- 2.1** WHS/OHS and sustainable energy principles and practices to reduce the incidents of accidents and

maintenance of HV underground cables

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 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 HV underground polymeric cables to ensure completion in an agreed timeframe and to quality standards with a minimum of waste according to requirements
- 2.5 Electrical cables are laid in accordance with the work schedule and requirements/established procedures
- 2.6 De-energised HV underground cables are installed according to the work schedule and requirements/established procedures
- 2.7 Maintenance, including repair and/or replacement of de-energised HV underground cables, is carried out in accordance with the work schedule and requirements/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
- 2.9 Unplanned events in the installation and maintenance of HV underground cables 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 laying, installation and maintenance of HV

- 3.1 Work undertaken is checked against work schedule for conformance with requirements and anomalies reported in accordance with established procedures

underground cables

- 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 HV underground cables 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 UETTDRCJ34 Install and maintain network infrastructure HV underground cables.

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 UETDRDU004 Install and maintain network infrastructure HV underground cables

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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 the use of risk control measures
- applying sustainable energy principles and practices
- laying at least one (1) of the following cable types:
 - high voltage (HV) polymeric
 - HV paper insulated
- laying HV cables using at least one (1) of the following installation methods:
 - direct lay
 - on racks
 - in conduits
- laying HV cables using at least one (1) cable pulling method of the following:
 - stocking pulling
 - bond pulling
 - armour pulling
 - nose pull attachments
- sealing HV cables using at least two (2) of the following cable sealing methods:
 - heat shrinkable
 - pre-stretched materials
 - tin/lead wiping
 - pre-moulded components
- cutting HV cables using at least one (1) of the following cable cutting methods:
 - hydraulic cutters
 - electric reciprocating
 - motorised
 - hand tools
- laying HV cables using at least four (4) of the following supporting plant and equipment:
 - drum jacks

- winches
- spindles
- capstans
- bollards
- cable trailers
- rollers
- lubricants
- ropes
- bell mouths
- draw wires/rods
- joining HV cables using at least two (2) of the following jointing methods:
 - tee-off joints
 - straight through joint
 - parallel branch joint
 - parallel joint
- incorporating at least one (1) of the following:
 - transformers
 - ring main units
 - chamber substations
- incorporating at least one (1) of the following:
 - busbar/termination boxes
 - links/fuses
 - termination boxes
 - control gear
 - circuit breakers
- jointing and terminating HV cables using at least two (2) of the following material types:
 - resin filled boxes
 - compound filled boxes
 - polymeric tape
 - heat shrink
 - 'slip-on' moulds
 - pre-stretched polymeric
- testing HV cables using all the following testing and recording equipment:
 - insulation resistance testers
 - voltage detectors
- incorporating all the following:
 - cable identification devices
 - cable spiking devices
- incorporating at least two (2) of the following:

- mechanical connectors
- compression connectors
- lugs
- 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 pertaining to the jointing of HV underground polymeric cables
- requirements for the use of enterprise construction manuals, system diagrams/plans and drawings encompassing:
 - characteristics of different types of cables and components
 - purpose of stress control
 - applications of various tools and equipment for HV jointing
- procedure for isolating HV underground cables encompassing:
 - method for proving safe to work
 - earthing procedures
- techniques in jointing HV underground polymeric cable encompassing:
 - short circuit cores and seal cable
 - straight through
 - trifurcating
- techniques in HV terminations encompassing:
 - pole top termination
 - substation/switchgear termination
 - ABC termination
 - telcon termination
- procedures for repairing HV underground cables encompassing:
 - location of faults
 - types of damage
 - techniques to repairs to sheath
 - techniques to repairs to core.

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, facilities, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, relevant industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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