



Australian Government

UETDRDU017 Locate faults in underground power cables

Release: 1

UETDRDU017 Locate faults in underground power 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 involves the skills and knowledge required to locate faults in underground power cables in the electricity supply industry (ESI).

It includes setting up test equipment and using the equipment to pre locate and pinpoint the cable fault. It also includes interpreting test results, documenting the fault location and likely cause and listing recommendations for correcting the cable fault.

The application of the skills and knowledge described in this unit may require a licence/registration to practice in the workplace.

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

Pre-requisite Unit

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications

UEEEL0020 Solve problems in low voltage a.c. circuits

UEEEL0021 Solve problems in magnetic and electromagnetic devices

UETDREL005 Work safely in the vicinity of live electrical apparatus

Competency Field

Distribution Underground

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.

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

1 Prepare to locate underground power cable faults

- 1.1** Legislation, regulations, standards, codes of practice and organisational workplace requirements for the work to be performed are referred to and confirmed
- 1.2** Work instruction is obtained and confirmed in accordance with workplace requirements
- 1.3** Tools, equipment and personal protective equipment (PPE) required for work are determined, obtained and confirmed in working order
- 1.4** Hazards are identified, risks assessed and control measures identified and applied
- 1.5** Work is prioritised and sequenced for completion in accordance with work instruction and workplace requirements
- 1.6** Work permits are organised in accordance with workplace requirements
- 1.7** Worksite is prepared in accordance with the work instruction and workplace requirements

2 Carry out the locating of underground power cable faults

- 2.1** Legislation, regulations, standards, codes of practice and organisational workplace requirements for the work to be performed are applied and monitored
- 2.2** Lifting, working in a confined space, and the use of tools, equipment and PPE are carried out in accordance with workplace requirements
- 2.3** Hazard control measures are monitored in accordance with workplace requirements
- 2.4** Test equipment is positioned, set up for testing and confirmed to be operating correctly
- 2.5** Cable is tested and confirmed de-energised in accordance with workplace requirements
- 2.6** Work permits are received and signed in accordance with workplace requirements

- 2.7 Cable is prepared for testing and test equipment connected to the cable in accordance with workplace requirements
 - 2.8 Cable is tested to pre-locate the cable fault in accordance with workplace requirements
 - 2.9 Cable is tested to pinpoint the location of the cable fault in accordance with workplace requirements
 - 2.10 Cable faults are identified and analysed in accordance with workplace requirements
 - 2.11 Incidents or unplanned events are responded to in accordance with workplace requirements
- 3 Complete work and documentation**
- 3.1 Recommendations for rectification are made in accordance with workplace requirements
 - 3.2 Incidents or unplanned events are reported in accordance with workplace requirements
 - 3.3 Worksite is rehabilitated, cleaned and made safe in accordance with workplace requirements
 - 3.4 Tools and equipment are cleaned, checked and returned to storage in accordance with workplace requirements
 - 3.5 Work permits are signed off in accordance with workplace requirements
 - 3.6 Work records, reports and documentation are completed in accordance with workplace requirements

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 UETTDRI58 Locate faults in power system underground power 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 UETDRDU017 Locate faults in underground power 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 legislation, regulations, standards, codes of practice and organisational workplace requirements, including:
 - work health and safety (WHS)/occupational health and safety (OHS)
 - safe approach distances
- identifying hazards, assessing risks, identifying, applying and monitoring control measures
- obtaining, inspecting and using relevant personal protective equipment (PPE)
- obtaining and signing on and off relevant work permits in accordance with workplace requirements
- interpreting and using drawings, diagrams and instructions
- using at least one (1) of the following cable fault pre location methods for low resistance faults:
 - time-domain reflectometry (TDR)
 - bridge method (e.g. Murray Loop)
- using at least one (1) of the following cable fault prelocation methods for high resistance faults:
 - arc reflection
 - voltage decay
 - impulse current
 - bridge (Murray loop)
- using at least one (1) of the following cable fault pinpointing methods:
 - acoustic detection using surge generator (thumper)
 - audio frequency pinpointing using twist method
 - fault sniffing
 - step voltage (pool of potential test or earth gradient method)
- locating at least three (3) of the following cable faults:
 - short circuit
 - open circuits

- high resistance
- earth and sheath
- humid and wet
- flashing
- analysing the testing results to determine the type and location of fault
- dealing with an unplanned event on at least one (1) occasion
- completing relevant work records, reports and documentation.

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:

- legislation, regulations, standards, codes of practice and organisational workplace requirements, including:
 - WHS/OHS
 - safe approach distances
 - working in confined spaces
 - trench safety
 - manual handling
- hazard, risk assessment and risk control requirements, including potential hazards
- types and application of PPE
- safe use of tools and equipment
- application, purpose and types of work permits
- events that constitute an incident or unplanned event
- procedures for responding to an unplanned event or incident
- work instruction requirements, including:
 - types of and layout of drawings
 - cable routes
 - manufacturer's instructions
 - workplace documentation procedures
- high voltage (HV) and low voltage (LV) paper insulated and polymeric cables, including:
 - types and sizes
 - construction, characteristics and properties
 - minimum bending radius
- cable fault location, including:
 - types of and causes of cable defects
 - types of and causes of cable faults
 - low resistance cable fault pre-location methods
 - high resistance cable fault pre-location methods
 - cable fault pinpointing methods

- advantages and disadvantages of different testing methods
- types of cable fault locating equipment
- use of cable fault locating equipment
- cable fault locating procedures.

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:

- relevant and appropriate materials, tools, facilities, equipment and PPE currently used in industry for locating faults in underground power cables
- applicable documentation, including workplace requirements, relevant industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

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