



Australian Government

Department of Education, Employment and Workplace Relations

UETTD RIS56A Install and maintain low voltage overhead services

Release: 1

UETTDRIS56A Install and maintain low voltage overhead services

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This Competency Standard Unit covers the installation, maintenance and connection of low voltage overhead service lines and associated equipment (between the connection point and the point of supply - customers' premises). Maintenance includes the repair and replacement of service cables, service fuses and the replacement and repair of service hardware, the identification and rectification of faults. It also covers insulation, voltage, polarity testing and phase rotation.

Application of the Unit

Application of the Unit 2)

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry

License to practice**3)**

safety and compliance, industrial relations, environmental protection, anti discrimination and training.
Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment.

Pre-Requisites**Prerequisite Unit(s)****4)****Competencies****4.1)**

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s):

Transmission Overhead

Distribution Overhead

Rail Traction

Distribution Cable Jointing

Electrotechnology Electrician

Common Unit Group

Unit Code

Unit Title

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,

Prerequisite Unit(s)**4)**

standards, codes and specifications

UEENEEG101A

Solve problems in electromagnetic devices and related circuits

UEENEEG102A

Solve problems in low voltage a.c. Circuits

UETTDREL16A

Working safely near live electrical apparatus

Transmission Overhead Pathway Group

Unit Code

Unit Title

UETTDREL11A

Apply sustainable energy and environmental procedures

UETTDREL12A

Operate plant and equipment near live electrical conductors and apparatus

UETTDRI54A

Install and maintain poles, structures, overhead conductors and cables

UETTD RTP26A

Install transmission structures and associated hardware

UETTD RTP27A

Maintain transmission structures and associated hardware

UETTD RTP29A

Install and maintain transmission overhead conductors and cables

Distribution Overhead Pathway Group

Unit Code

Unit Title

UETTD RDP12A

Maintain overhead energised low voltage conductors and cables

UETTDREL11A

Apply sustainable energy and environmental procedures

UETTDREL12A

Operate plant and equipment near live electrical conductors and apparatus

Prerequisite Unit(s)**4)**

UETTDRI52A Install and maintain poles, structures and associated hardware

UETTDRI54A Install and maintain poles, structures, overhead conductors and cables

Rail Traction Pathway Group

Unit Code	Unit Title
UETTDREL11A	Apply sustainable energy and environmental procedures
UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
UETTDRI52A	Install and maintain poles, structures and associated hardware
UETTDRI54A	Install and maintain poles, structures, overhead conductors and cables
UETTDRT21A	Install traction overhead wiring systems
UETTDRT22A	Maintain traction overhead wiring systems
UETTDRT23A	Install rail traction bonds
UETTDRT27A	Install overhead traction components and equipment
UETTDRT28A	Maintain overhead traction components and equipment

Distribution Cable Jointing Pathway Group

UETTDRCJ21A	Lay ESI electrical cables
UETTDRCJ26A	Install and maintain de-energised low voltage underground polymeric cables.
UETTDRCJ27A	Install and maintain de-energised

Prerequisite Unit(s)**4)**

high voltage underground polymeric cables.

UETTDREL11A

Apply sustainable energy and environmental procedures

UETTDREL12A

Operate plant and equipment near live electrical conductors and apparatus

UETTDRI541A

Install network infrastructure electrical equipment

UETTDRI542A

Maintain network infrastructure electrical equipment

UETTDRI55A

Install and maintain low voltage underground services

Electrotechnology Electrician Pathway Group

Unit Code

Unit Title

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 electrical apparatus and circuits

UEENEEG063A

Arrange circuits, control and protection for general electrical installations

UEENEEG106A

Terminate cables, cords and accessories for low voltage circuits

UEENEEG108A

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

UEENEEG109A

Develop and connect electrical control circuits

UEENEEK142A

Apply environmentally and

Prerequisite Unit(s) 4)

sustainable energy procedures in the energy sector

UETTDRIS67A

Solve problems in energy supply network equipment

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information**Employability Skills 5)**

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare for the installation and maintenance of LV overhead services and associated equipment	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection. 1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites. 1.3 OHS policies and procedures related to requirements and established procedures for the installation and maintenance of LV overhead services and associated equipment are obtained and confirmed for the purposes of the work to be performed and communicated. 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, 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 required for the job are obtained and confirmed in working order. 1.8 Relevant personnel at worksite are confirmed current in First Aid, Pole Top Rescue and other related work procedures according to requirements. 1.9 Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.

ELEMENT	PERFORMANCE CRITERIA
2 Carry out installation and maintenance of LV overhead services and associated equipment	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.
	2.1 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 Essential knowledge and associated skills are applied in the safe installation and maintenance of LV overhead services and associated equipment to ensure completion to quality standards with a minimum of waste according to requirements.
	2.4 LV overhead services and associated equipment are installed according to the work schedule and requirements/established procedures.
	2.5 Maintenance, including repair and/or replacement of LV overhead services and associated equipment is carried out, in accordance with the work schedule and requirements/established procedures.
	2.6 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.

ELEMENT	PERFORMANCE CRITERIA
3 Complete the installation and maintenance of LV overhead services and associated equipment	2.7 Unplanned events during the installation and maintenance of LV services and associated equipment are undertaken within the scope of established procedures.
	2.8 Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills.
	2.9 Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
	3.1 Work undertaken is checked/tested 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 Work site 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 permit(s) are signed off and, the LV overhead services and associated equipment are returned to service in accordance with requirements.
	3.6 Works completion records, reports, as installed /modified drawing and/or documentation and information are finalised and processed and appropriate personnel notified.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) Essential Knowledge and Associated Skills (EKAS): This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of installing and maintaining low voltage services (overhead).

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-TIS56A Low voltage electrical overhead service installation

Evidence shall show an understanding of the installation of low voltage electrical services to an extent indicated by the following aspects:

T1 Standards, codes, legislation, supply authority regulations and or enterprise requirements

T2 Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings, encompassing:

- Types of low voltage overhead services
- Methods of construction and installation
- Minimum clearances for overhead services to assets and structures
- Ground clearances for overhead services
- Maximum span lengths and tensions for overhead services
- Customer poles

T3 Installation equipment/tools

- Equipment and tools for overhead service installation
- Fittings and hardware for overhead service installation

T4 Characteristics and applications of different types of cables encompassing:

- Cable cross-sectional area of conductors
- Current rating and fuse types and ratings

T5 Stringing and terminating methods encompassing:

- Energised and de-energised cables
- Connections to point of attachment, fuse boxes and pole top boxes
- Termination at customer pole

T6 Connection of overhead services:

- Types of overhead service connections
- Live low voltage work principles

T7 Techniques for maintenance of overhead service installations encompassing:

- Diagnosis and repair of faults
- Removing, repairing and replacing of damaged overhead services

REQUIRED SKILLS AND KNOWLEDGE

- Removing and replacing pole type fuses

T8 Testing and commissioning procedures encompassing:

- Inspection
- Equipment functionality tests
- Continuity tests
- Polarity, voltage and phase sequence tests
- Neutral and phase identification tests
- Neutral integrity tests
- Meter function test
- Testing check forms

T9 Connection principles:

- Purpose and function of MEN system
- Types of connection faults
- Causes and effects of incorrect and poor electrical connections
- Principles of loop impedance
- Reasons for and methods used to maintain standard phase sequencing
- Purpose and operation of service fusing
- Use of independent earth for testing

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the range statement of the unit of competency and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all component parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment 9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment

is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and, Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

**Critical aspects
of evidence
required to
demonstrate
competency in
this unit**

9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines – UET12". Evidence shall also comprise:

- A representative body of Performance Criteria demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace

procedures and practices including the use of risk control measures as specified in the Performance Criteria and range; and

- Apply sustainable energy principles and practices as specified in the Performance Criteria and range; and
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment; and
- Demonstrate an appropriate level of employability skills; and
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures; and
- Demonstrated performance across a representative range of contexts from the prescribed items below:

Range of tools/equipment/materials/procedures/workplaces/other variables		
Group No	The minimum number of items on which skill is to be demonstrated	Item List
A	At least two of the following:	Overhead service line (three phase)* Overhead service line (single phase) Overhead service line (two phase) (* must do)
B	At least one of the following:	Service fuse Circuit breakers (pole) Service link
C	All of the following:	Polarity test * Phase rotation test Continuity test Voltage test

		(* must do)
D	At least one of the following:	Aluminium LV mains Copper LV mains LV ABC mains
E	At least one occasion	Dealing with an unplanned event by drawing on essential knowledge and associated skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

Context of and specific resources for assessment 9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual installation and maintenance of overhead LV services.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency working below ground, in limited spaces, with different structural/construction types and method and in a variety of environments.

Method of assessment 9.4)

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 “Assessment Guidelines”.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit

applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

**Concurrent
assessment and
relationship with
other units**

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation and maintenance of overhead low voltage services as they relate to distribution circuits and associated equipment and includes the identification of faults.

Installation may include, the erection and connection of service lines, the fitting and connection of pole fuses or circuit breakers and the testing and commissioning of the service.

Maintenance may include the identification and diagnosis of faults, the removal, replacement or repair of service lines and associated hardware and the temporary installation of services and associated equipment and the testing and commissioning of the service.

Testing procedures may include continuity, polarity, phase rotation, insulation resistance and voltage.

Testing equipment may include, digital/analogue voltage testers, multimeters, phase rotation testers, load testers, insulation resistance and continuity testers.

Associated hardware may include pole fuse units, circuit breakers, contactors, mains connection boxes.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures

RANGE STATEMENT

- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation
- MSDS
- Notification.
- OHS practices
- OHS issues
- Permits and/or permits to work
- Personnel
- Quality assurance systems
- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Industry Specific Cross-Discipline Units