



Australian Government

Department of Education, Employment and Workplace Relations

UETTDRCJ99A Test and verify distribution cable jointing installations

Release: 1

UETTDRCJ99A Test and verify distribution cable jointing installations

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This Competency Standard Unit covers the installation and maintenance of de-energised high voltage and low voltage underground polymeric cables and includes underground services, network infrastructure, the jointing, terminating and repair of cables. It encompasses working safely, visual inspections and mandatory and functional test procedures, identifying non-compliance defects and mandatory reporting requirements

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 safety and compliance, industrial relations, environmental

License to practice**3)**

protection, anti discrimination and training.
Commonwealth, state/Territory or Local Government legislation and regulations may exist that limits the age of operating certain equipment

Note:

1. Compliance and currency of permits may be required in various jurisdictions and typically relate to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working at heights, near live electrical apparatus, first aid, lifting and site rehabilitation.

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):

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

Prerequisite Unit(s)	4)	equipment
	UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
	UEENEEG101A	Solve problems in electromagnetic devices and related circuits
	UEENEEG102A	Solve problems in low voltage a.c. Circuits
	UETTDRCJ21A	Lay ESI electrical cables
	UETTDRCJ26A	Install and maintain de-energised low voltage underground polymeric cables.
	UETTDRCJ27A	Install and maintain de-energised high voltage underground polymeric cables.
	UETTDREL11A	Apply sustainable energy and environmental procedures
	UETTDREL12A	Operate plant and equipment near live electrical conductors and apparatus
	UETTDREL16A	Working safely near live electrical apparatus
	UETTDRI41A	Install network infrastructure electrical equipment
	UETTDRI42A	Maintain network infrastructure electrical equipment
	UETTDRI55A	Install and maintain low voltage underground services

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 jointing LV and HV underground polymeric cables and LV services	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 of electrical equipment (network infrastructure) are obtained and confirmed for the purposes of the work to be performed and communicated.

ELEMENT**PERFORMANCE CRITERIA**

- 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 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.
- 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.

ELEMENT	PERFORMANCE CRITERIA
2 Carry out the jointing LV and HV underground polymeric cables and LV services	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 in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely operated near energised and exposed electrical conductors/apparatus according to requirements and procedures.
	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 inspection, safe access, testing and verification of low voltage and high voltage underground polymeric cables to ensure completion in an agreed time frame and to quality standards with minimum of waste according to requirements.
	2.5 Low voltage and high voltage underground polymeric cables and associated equipment are installed, terminated/connected according to the work schedule and requirements/established procedures.
	2.6 Maintenance, including repair and/or replacement of low voltage and high voltage underground polymeric cables is carried out, in accordance with the work schedule and requirements / established procedures.
	2.7 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.
	2.8 Underground cable installations and associated hardware are visually inspected and confirmed as positioned, secured and terminated/connected

ELEMENT	PERFORMANCE CRITERIA
	in accordance with requirements and established procedures.
	2.9 Tests and/or measurements to verify cable jointing installations are determined and conducted in strict accordance with OHS requirements and within established safety 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 jointing LV and HV underground polymeric cables and LV services	3.1 Work undertaken is checked against work 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 cables are returned to service in accordance with requirements.
	3.6 Works completion records, reports, drawings 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 laying electrical cables.

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

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Evidence shall show knowledge and skills of cable jointing to an extent indicated by the following aspects:

T1 Legislated regulations encompassing:

- legislation and regulations that require distribution cable jointing installations and equipment to be tested to ensure they are safe.
- the person/bodies responsible for the various aspects of ensuring distribution cable jointing installations are safe.
- results of tests that show a distribution cable jointing installation is safe for connection to the supply.
- results of periodic inspection and tests that show wiring and equipment is safe to use.
- results of periodic inspection and tests that show the distribution cable jointing installations electrical equipment is safe to use.

T2 Testing installations encompassing:

- Distribution cable jointing system phasing, phase rotation and polarity is correct and conforms to network construction standards
- Installation resistance is adequate
- Cable identification

T3 Documentation encompassing:

- results of tests conducted on a distribution cable jointing installation in accordance with work package requirements and ensure the distribution cable jointing installation is safe.
- documents of periodic inspection and testing of distribution cable jointing installation and equipment in accordance with requirements.

T4 Techniques in the installation and maintenance of network infrastructure

T5 Techniques in jointing, terminating and maintenance encompassing:

- high voltage polymeric cables
- low voltage polymeric cables
- underground services

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	Item List

	number of items on which skill is to be demonstrated	
A	All of the following:	LV polymeric cables HV polymeric cables
B	Any two of the following:	Tee-off joints Straight through joints Parallel branch joints Parallel joints Trifurcating joint
C	At least two of the following:	Pillars (single phase) Pillars (three phase) Lighting pillar standards LV switchboards Substations UGOH terminations
D	At least one of the following:	Transformers Switchgear Ring main units
E	At least one of the following:	Resin filled boxes Compound filled boxes Polymeric tape Heat shrink Slip-on moulds
F	At least one of the following:	Compression lugs Mechanical connectors Insulation piercing connectors Lugs
G	At least four of the following	Polarity test* Phase rotation test Continuity test

		Voltage test Insulation resistance test (*must do)
H	All of the following	Cable ID devices Cable spiking devices

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.
- Network construction standards
- Network supply standards
- Suitable work environment, facilities, equipment and materials to undertake actual installation, maintenance, testing and verification on de-energised low voltage underground polymeric cables.

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.

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This Competency Standard Unit shall be demonstrated in the installation and maintenance of de-energised high voltage and low voltage underground polymeric cables and includes underground services, network infrastructure, the jointing, terminating and repair of cables. It encompasses working safely, visual inspections and mandatory and functional test procedures, identifying non-compliance defects and mandatory reporting requirements

Test and recording equipment may include digital/analogue voltage detectors, multimeters, phase rotation testers, load testers, continuity testers, tong ammeters, cable identification and spiking equipment and insulation resistance testers.

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

Installation may include, the laying and connection of cables, connection of the cable to underground equipment, the fitting and connection of fuses or circuit breakers and the testing and commissioning of the cable.

Maintenance may include the removal, repair and replacement of electrical equipment encompassing “like for like” and associated hardware as well as the termination and/or connection of this equipment according to requirements and the temporary installation of services and associated equipment. It also encompasses the identification of faults; the pre-commissioning tests involving the equipment/system and the interpretation of these tests against agreed specifications.

Service includes the connection between the customers’ point of supply and the underground pillar/pit connection (single phase), underground pillar/pit connection (three phase) and or underground to overhead connection.

Electrical equipment and associated hardware may include relevant transmission or distribution network; switchgear (e.g. reclosers, sectionalisers, drop-out fuses, disconnectors, isolators, air break switches, gas filled switches, fuse switches); transformers (e.g. padmount, pole-mounted and mobile); reactors; fault indicators; regulators;; capacitors; relays (simple); mobile generators and surge arrestors; support brackets and the like.

Jointing and terminating equipment and locations may include circuit breakers, contactors, mains connection boxes, links, fuses, disconnect boxes, ring main units, distribution fuse boxes, pad mount and ground transformers, chamber substations, LV switchboards, pillars/turrets, busbar/termination boxes, street lighting control points and street lighting columns.

RANGE STATEMENT

Jointing and terminating materials may include compound and resin filled boxes, polymeric tape materials, polymeric heat shrink materials, "slip-on" moulded components and pre-stretched polymeric materials, compression, welded and mechanical connectors.

It does not include the energisation of equipment in a highly complex, interdependent and interconnected electricity supply network system, where the effects of unintended consequences on the system are high risk and appropriate personnel effect energisation.

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- 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
- 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)
	Cable Jointing