



Australian Government

Department of Education, Employment and Workplace Relations

UETTDRCJ31A Install and maintain polymeric specialised underground cables

Release: 1

UETTDRCJ31A Install and maintain polymeric specialised underground cables

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This Competency Standard Unit covers the installation, maintenance and repair of polymeric specialised underground cables including XLPE and EPR above 33 kV. It includes jointing and terminating, as well as working under induced voltages and undertaking the relevant tests required for jointing. It also encompasses the preparation of the cable jointing bay, the preparation of cables and phasing out, cable identification and spiking, the treatment/handling of, but not jointing fibre optical cables.

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

License to practice**3)**

regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry 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):

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, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c.

Prerequisite Unit(s)	4)	Circuits
	UETTDRCJ21A	Lay ESI electrical cables
	UETTDRCJ23A	Install and maintain de-energised high voltage underground paper insulated cables.
	UETTDRCJ26A	Install and maintain de-energised low voltage underground polymeric cables.
	UETTDRCJ27A	Install and maintain de-energised high voltage underground polymeric cables.
	UETTDRCJ99A	Test and verify distribution cable jointing installations
	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 4 Writing 4 Numeracy 4

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/Plan to install and maintain polymeric specialised underground cables	1.1	Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are obtained, analysed, if necessary, by site inspection and the extent of the preparation of the work determined for planning and coordination.
		1.2	Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
		1.3	Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear, to ensure safe systems of work are followed and according to established procedures.

ELEMENT**PERFORMANCE CRITERIA**

- 1.4 Work is prioritised and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to a quality standard and in accordance with established procedures.
- 1.5 Risk control measures are identified, prioritised and evaluated against the work schedule.
- 1.6 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures.
- 1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are identified, scheduled and coordinated and confirmed in a safe and technical working order.
- 1.8 Clients/customers are provided with possible solutions and/or options within the scope, acceptable cost and requirements.
- 1.9 Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved and activities coordinated to carry out work.
- 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 coordinated and authorised where applicable in accordance with established procedures.
- 1.12 Positioning of road signs, barriers and warning devices is planned and coordinated in accordance with requirements.

ELEMENT	PERFORMANCE CRITERIA
2 Carry out the installation and maintenance of polymeric specialised underground cables	2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and actioned in accordance with requirements and/or established procedures. 2.2 First Aid, Rescue and other related work procedures are performed according to requirements and/or established procedures. 2.3 Lifting, climbing, working in confined spaces and aloft, and use of power tools/equipment, techniques and practices are safely exercised according to requirements. 2.4 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. 2.5 Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures. 2.6 Installation and/or maintenance of polymeric specialised underground cables is carried out, in accordance with the work schedule and requirements and/or established procedures. 2.7 Essential knowledge and associated skills are applied in the safe installation and/or maintenance of polymeric specialised underground cables to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. 2.8 Solutions to non-routine problems are identified and actioned using acquired essential knowledge and associated skills according to requirements. 2.9 Ongoing checks of quality of the work are undertaken in accordance with requirements and established procedures to ensure a quality like outcome is achieved for the client/customer

ELEMENT	PERFORMANCE CRITERIA
3 Complete the installation and maintenance of polymeric specialised underground cables	and to a community/industry standard.
	3.1 Work undertaken is checked against works schedule for conformance with requirements, anomalies reported and solutions identified in accordance with established procedures.
	3.2 Accidents and/or injuries are reported in accordance with requirements/established procedures.
	3.3 Work site is rehabilitated, cleaned up and confirmed 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, underground cables are returned to service and advised to client/customer in accordance with requirements.
3.6 Works completion records, reports, as installed /modified drawing(s) and/or documentation and information are confirmed, 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 polymeric specialised underground cables

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

KS01-TCJ31A Polymeric specialised underground cables

Evidence shall show an understanding of principles, installation and maintenance and jointing of polymeric specialised underground cables to an extent indicated by the following aspects:

T1 Polymeric specialised underground cables principles encompassing:

- Legislation, Standards, codes, legislation, supply authority regulations and or enterprise requirements pertaining to the working with polymeric specialised underground cables
- Types of polymeric specialised underground cables – construction, characteristics and capabilities of the polymeric specialised cable, pressure/volume characteristics of oil and gas, precautions when handling
- Types and functions of tools and equipment used on polymeric specialised underground cables
- Techniques when handling polymeric specialised underground cables

T2 Installation and maintenance of polymeric specialised underground cables encompassing:

- Legislation, Standards, codes, legislation, supply authority regulations and or enterprise requirements pertaining to the installation and maintenance of polymeric specialised underground cables
- Safety precautions of working with polymeric specialised underground cables - safe operation procedures, Occupational Health and Safety hazards and precautions, dangers of working in confined spaces, identification of OHS hazards, assessing and controlling risks, types, selection, maintenance, storage and uses of personnel protective equipment, authorisation to work systems and isolation procedures, safe working policies, procedures and practices when using/operating specialised equipment, emergency response and rescue including First Aid etc
- Types, function and serviceability of tools and equipment used for the installation of polymeric specialised underground cables
- Techniques in the safe installation of polymeric specialised underground cables
- Techniques in the safe maintenance of polymeric specialised underground cables
- Techniques in the safe testing/inspection of the polymeric specialised underground cables to ensure successful installation and/or maintenance has occurred

REQUIRED SKILLS AND KNOWLEDGE

T3 Jointing and termination of polymeric specialised underground cables encompassing:

- Legislation, Standards, codes, legislation, supply authority regulations and or enterprise requirements pertaining to the working with polymeric specialised underground cables
- Safety precautions of working with polymeric specialised underground cables - safe operation procedures, Occupational Health and Safety hazards and precautions, dangers of working in confined spaces, identification of OHS hazards, assessing and controlling risks, types, selection, maintenance, storage and uses of personnel protective equipment, authorisation to work systems and isolation procedures, safe working policies, procedures and practices when using/operating specialised equipment, emergency response and rescue including First Aid etc
- Types, function and serviceability of tools and equipment used for the jointing and terminating of polymeric specialised underground cables
- Techniques in the safe jointing and terminating polymeric specialised underground cables
- Techniques in the safe testing of the polymeric specialised underground cables to ensure successful jointing and/or termination has occurred

T4 Enterprise specific — policy and procedure instructions encompassing:

- Responsibilities and duty of care of employer and employee relationship
- Methods of obtaining the up-to-date information on enterprise policy and procedures
- Rules and regulations
- Induction into workplace - location of work area and storage area, timetable, uniform, personal well-being, housekeeping rules, emergency procedures, evacuation procedures
- Techniques when deal with others - working in teams, customer relation, complaint and issues procedures.
- Overview of enterprise professional development - fire fighting procedures, fatigue management, training and competency development - understanding and promotion

T5 Enterprises specific — OHS instructions encompassing:

- Standards, codes, legislation, supply authority regulations and specific enterprise regulations pertaining to the OHS policies and procedures
- Methods of obtaining the up-to-date information on enterprise OHS policy and procedures
- Specific enterprise personal protection equipment - type and application, where and when to be used, method of replacement, responsibility of maintenance including cleaning inspection and testing, emergency response, rescue, evacuation and First Aid procedures
- Personal well-being – hygiene, fatigue/stress management, drugs/alcohol

REQUIRED SKILLS AND KNOWLEDGE

- OHS training - induction training, specific hazard training, specific task or equipment training, emergency and evacuation training, training as part of broader programs such as equipment operation
- OHS records including audits, inspection reports, workplace health and environmental monitoring records, training and instruction records, manufacturers and suppliers information such as MSDSs, registers, maintenance reports, workers compensation and rehabilitation records and First Aid/medical records

T6 Enterprises specific — technical drawing and documents encompassing:

- Types and application of enterprise specific drawings and documents - electrical and electronic drawings, mechanical drawings, project charts, schedules, graphs, technical manuals and catalogues
- Instruction/worksheets sheets - types and application of enterprise specific symbols and diagrams
- Title box - description of parts and version control

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	Install and maintain at least one of the following:	Specialised XLPE cables above 33 kV Specialised EPR cables above 33 kV
B	All of the following:	Straight through joints. Terminations
C	Use of at least three of the following specialised cable installation equipment:	Winches Caterpillars Rollers Bond lines Nose pull devices Drum jacks
D	At least two of the following:	Connectors Mechanical connectors Compression connectors
E	At least two of the following:	Air boxes Compound filled boxes

		Gas filled boxes
F	At least two of the following:	Polymeric tape materials Heat shrink materials Moulded components
G	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 polymeric specialised underground cables.

In addition to the resources listed above, in context of and specific resources for assessment, evidence should show demonstrated competency working at realistic heights above ground i.e. above 3 metres, 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)

For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with the following units:

UETTDRCJ2 9A Install gas and oil filled specialised underground cables

UETTDRCJ3 0A Maintain gas and oil filled specialised underground cables

UETTDRCJ3 2A Install and maintain gas and oil pressure systems for specialised underground cables

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 polymeric specialised underground cables including XLPE and EPR above 33 kV, and covers the installation, jointing, terminating, repair and replacement of cables used in systems and circuits and the issuing/accepting of relevant permits.

It also encompasses the preparation of the cable jointing bay, the preparation of cables and phasing out, the treatment/handling, but not jointing of fibre optical cables. Also cable identification and spiking are included.

Underground equipment may include switchgear, transformers, specialised cable joints and termination kits, specialised cable installation equipment, specialised cable heating equipment and tooling.

Test and recording equipment includes voltage detectors, cable identification equipment, cable spiking equipment and insulation resistance testers.

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

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)**

Cable Jointing