



Australian Government

UETTD RTP34A Install/maintain overhead transmission network infrastructure

Release: 1

UETTD RTP34A Install/maintain overhead transmission network infrastructure

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This Competency Standard Unit covers the erection of non-energised, pyramid, delta, Pi or enterprise specific transmission towers and associated hardware and includes installation and maintenance of poles and/or structures and associated hardware and the installation and maintenance of overhead conductors and cables used on towers. It encompasses the erection of components in accordance with construction plans, specifications, work orders and standing enterprise requirements. Erection could also involve cleaning and welding. It also encompasses maintenance work associated with the diagnosing of faults, the conducting of visual inspections, the confirmation of phasing and the completion of other enterprise tests on overhead conductors and cables. It also encompasses confirming isolation of systems and circuits, and/accepting/ issuing electrical permits. The updating of system data, records and or completion of relevant documentation in accordance with enterprise requirements also forms part of this competency.

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 requires 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 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

Prerequisite Unit(s)**4)**

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 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 electromagnetic devices and related 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

Prerequisite Unit(s) 4)

UEENEEK142A	Apply environmentally and sustainable energy procedures in the energy sector
UETTDREL16A	Working safely near live electrical apparatus
UETTD RIS62A	Implement and monitor the power system organisational OHS policies, procedures and programs
UETTD RIS63A	Implement and monitor the power system environmental and sustainable energy management policies and procedures
UETTD RIS67A	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	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 for the installation and maintenance of transmission network infrastructure	<p>1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.</p> <p>1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.</p> <p>1.3 OHS policies and procedures related to requirements and established procedures for the installation and maintenance of transmission network infrastructure are obtained and confirmed for the purposes of the work to be performed and communicated.</p> <p>1.4 Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.</p> <p>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.</p> <p>1.6 Relevant work permits are obtained to access and perform work according to requirements and/or established procedures.</p> <p>1.7 Resources including personnel, equipment, tools and personal protective equipment required for the job are obtained and confirmed in working order.</p>

ELEMENT**PERFORMANCE CRITERIA**

- | | | |
|---|---|--|
| | 1.8 | Relevant personnel at work site are confirmed current in First Aid, Tower/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. |
| | 1.10 | Personnel participating in the work, including plant operators and contractors, are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures. |
| | 1.11 | Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures. |
| | 1.12 | Traffic management plan is identified and implemented. |
| 2 | Carry out the installation and maintenance of transmission network infrastructure | <p>2.1 OHS, sustainable energy and environmental principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures.</p> <p>2.2 Lifting, climbing, working aloft, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed.</p> <p>2.3 Systems and circuits are isolated as required, proved safe to work on in accordance with the requirements /permits and established procedures.</p> <p>2.4 Essential knowledge and associated skills are applied in the safe installation and maintenance of transmission network infrastructure to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements.</p> |

ELEMENT**PERFORMANCE CRITERIA**

- 2.5 Poles and/or structures and their associated hardware to be installed are stabilised according to requirements.
- 2.6 Installation of poles and/or structures is carried out, in accordance with the work schedule and requirements/established procedures.
- 2.7 Towers and associated hardware to be erected are stabilised according to requirements.
- 2.8 Maintenance, including repair and/or replacement of poles and/or structures is carried out, in accordance with the work schedule and requirements/established procedures.
- 2.9 Overhead conductor/cables are strung, tensioned and terminated as per requirements/established procedures.
- 2.10 Conductors and anti-vibration devices, spaces/spreaders are secured as per established procedures.
- 2.11 Electrical connections are made in accordance with the requirements/established procedures.
- 2.12 Maintenance, including repair and/or replacement of overhead conductors and cables used on towers is carried out, in accordance with the work schedule and requirements/established procedures.
- 2.13 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.
- 2.14 Erection of towers and associated hardware is carried out, in accordance with the work schedule and requirements/established procedures.
- 2.15 Unplanned events in the erection of towers and associated hardware are undertaken within the scope of established procedures.

ELEMENT**PERFORMANCE CRITERIA**

- | | | |
|--|------|---|
| | 2.16 | Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills. |
| | 2.17 | Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures. |
| 3 Complete the installation and maintenance of transmission network infrastructure | 3.1 | Work undertaken is checked 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 or disposed of in accordance with established procedures. |
| | 3.5 | Relevant work permit(s) are signed off and, the transmission network infrastructure is 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 erecting transmission towers and associated hardware.

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

KS01-TTP34A Overhead transmission network infrastructure

Evidence shall show an understanding of the installation and maintenance of overhead transmission network infrastructure to an extent indicated by the following aspects:

T1 Mathematics techniques encompassing:

- Calculations involving fractions, decimals, ratios, proportions
- Calculations involving area, volume, mass and density
- Calculations involving transposition and substitution of formulae
- Calculations involving simple trigonometric problems.

T2 Engineering mechanics encompassing:

- Identification of basic concepts, principles and applications - Application of velocity, acceleration, force, density, torque, and pressure
- Applications of the SI units
- The relationship between work, power and energy
- Behaviour of object under force - using a block and tackle under load, concept of mechanical advantage, determination of resultant forces and determining the sag in a catenary conductor and the force applied at each end
- Fundamentals of the basic laws of fluid mechanics.

T3 Materials properties encompassing:

- Identification and classification of engineering materials material properties
- Types and applications - properties of tensile strength, effects of temperature on the expansion of metals, ductibility, malleability, work hardening and annealing and the conditions that lead to corrosion and the properties of timbers.

T4 Basic rigging techniques encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements associated with rigging including the operation of cranes, hoists and winches and relevant certification and licensing (if required)
- Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings
- Safe use of rigging equipment, tools and associated equipment - types, techniques and application
- Site inspection procedures - identifying hazards, assessing and controlling risks,

REQUIRED SKILLS AND KNOWLEDGE

appropriate sequence of loading and unloading

- Determining the mass and dimensions of load
- Selection and inspection procedures - rigging equipment, materials and tools (natural and synthetic fibre ropes and chains, fittings, winch and capstan), ratings of wire ropes and slings, removing, repairing and replacing of damage parts.
- Techniques for assembling and erecting power winches and capstans
- Checking the integrity of support structure; visual inspection of load connections
- Techniques in moving, lifting, shifting, managing and placing loads - use of appropriate communication and signalling methods, codes of practice/compliance, enterprise and Commonwealth, State/Territory legislative requirements, weather conditions, erection of safety nets and lines, methods of fixing and anchoring loads, load stability.

T5 Procedure in providing store support encompassing:

- Classification and identification of equipment, components and tools
- Procedures for purchasing/ordering items, removing/dispatching items, stocktaking, security, bookkeeping/record keeping
- Material handling - warehouse/depot storage techniques, handling equipment, pallet lift trucks, forklifts, cable drum handling equipment.
- Safety procedures - storage and care of safety equipment, handling hazardous materials, storage of hazardous substances and dangerous goods, depot safety procedures.
- Manufacturers and suppliers information including material safety data sheets (MSDS)

T6 Generation systems encompassing:

- Methods of generating electricity - types of power stations and reasons for their location, layout of thermal and hydroelectric power stations
- Relationship between power control and load requirements - operating speeds for thermal and hydroelectric generating sets, typical generator voltage levels and output ratings
- The purpose and features of typical types of co-generation systems.

T7 Transmission, distribution and rail systems encompassing:

- Relationship between the transmission, distribution and rail/tram system within an overall power system - different organisations responsible for generation, transmission, distribution and rail/tram and, how they correlate and their functions
- Characteristics of a transmission, a distribution and a rail system - principal components, typical voltage levels and methods of transmission and distribution including grid type transmission systems, radial, parallel and ring main feeders
- Relationship between an overhead and underground supply systems within an overall power system - advantages/disadvantages, applications and the basic steps for planning and installing an overhead and underground distribution system
- Single line drawings and layouts - drawings and layouts of transmission and distribution systems including, radial, parallel and ring main feeders and the HV

REQUIRED SKILLS AND KNOWLEDGE

equipment associated with substations

T8 Substations, power transformers and reactors encompassing:

- Relationship between the substations within an overall power system - purpose, location in relation to load centres, layout of HV equipment within the substation and auxiliary equipment
- Characteristics of a power transformer - basic construction of distribution transformers, operation under load/no load conditions, types and basic operation of tap changing switches including solid state types, efficiency and cooling
- Auxiliary equipment used on transformers - function and basic operation of equipment
- Maintenance of a power transformer - basic connections, restrictions to parallel operation, problems and remedies associated with harmonics, testing and fault finding procedures
- Description, purpose and characteristics of a reactors

T9 Installation of poles and or structures and hardware encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements applicable to installing poles and associated hardware
- Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings
- Characteristics and applications of different types of poles and associated hardware
- Techniques for installing poles and associated hardware - types of installation equipment/tools, excavation methods, types of footings/foundations, types of attachments, earthing systems, clearances between conductors.
- Safe methods of erecting and stabling poles and or structures and cross arms
- Techniques for maintenance of poles and associated hardware - stabilisation techniques for unstable poles
- Methods of strengthen poles, maintenance and replacement of high voltage insulators and cross arms

T10 Transmission structures and hardware encompassing:

- Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings
- Types of structures
- Types and function of associated hardware/equipment and insulators
- Types of conductors
- Location of transmissions structures
- Other equipment used on transmission structures, e.g. aircraft warning devices

T11 Procedures for routine maintenance on transmission structures and hardware encompassing:

- Procedures for gaining access permits

REQUIRED SKILLS AND KNOWLEDGE

- Reasons for gaining access
- Types of maintenance procedures on transmission structures - procedure to follow for inspection/patrols according to the Transmission Supply Authority
- Erecting and removing of transmission equipment and hardware from a tower - climbing procedures, square rigging principles, calculation of forces at work within a given square rigging system, construction of a square rigging system.
- Procedures for changing insulators - vertical angle suspension, strain insulator, post insulator (horizontal or vertical) and bridge insulator, calculation of conductor forces
- Installation of temporary work platforms - types and function of installation tools and equipment, precautions and work methods to follow, procedures for installations of temporary work platforms.
- Installation of conductor protective hardware - types and selection of common dampers, tools and equipment, control of Aeolian vibration, procedures for the installation of dampers onto conductors.
- Dead line insulator washing - Supply Authority regulations, procedure for washing de-energised transmission lines.

T12 Procedures for installation and maintenance on transmission lines, structures and hardware encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements pertaining to the installation and maintenance of transmission lines and associated equipment
- Requirements for the use of enterprise construction manuals, system diagrams/plans and drawings - minimum construction clearances for transmission lines, sag/tension requirements.
- Construction types and structures used in transmission lines
- Types, sizes and characteristics of transmission conductors - aluminium conductors steel reinforced and earthing conductors.
- Types of electrical connections used to connect transmission conductors - compression termination and bolted termination.
- Causes and effects of poor electrical connections
- Types and application of specialised tools, equipment and hardware for the stringing of transmission conductors
- Techniques for stringing, tensioning and terminating transmission conductors
- Techniques for installation of associated hardware used on transmission towers
- Techniques for maintenance of damaged transmission conductors - repair and replacement

T13 Safe working practices and procedures for the installation of overhead transmission conductors encompassing:

- Limits of approach for personnel, vehicles, mobile plant and elevating work platforms (EWP)
- Requirements of persons prior to making bare hand contact with dead low voltage

REQUIRED SKILLS AND KNOWLEDGE

mains and apparatus

- Requirements of relevant electrical access permits necessary to allow work to be performed on low and high voltage apparatus
- Safe working practices - requirements to enable safe working on conductive poles, procedure to attach an “on-site” earthing device to de-energised low and high voltage overhead circuit, safe working practices when working with associated hardware/equipment and insulators, precautions of voltages on transmission structures, dangers when working at heights, identification of hazards, assessing and controlling risks, types, selection, maintenance and uses of personnel protective equipment, permit to work systems and isolation procedures, safe working practices when using specialised equipment.
- Emergency response and rescue including First Aid etc

T14 Powerline safety practices encompassing:

- Protective apparatus and apparel for linework - responsibilities for the selection, use, maintenance and storage of protective apparatus and apparel and the types of protective apparatus and apparel used for the line worker
- Requirements for the use of ladders - carrying, erecting, collapsing and lowering different types of extension ladder against a standing pole, maintenance checks on different types of ladders, renewal of extension ropes and the safety issues relating to clearances from overhead conductors
- Requirements for climbing and working aloft - methods used to identify a pole is safe to climb, methods used to inspect a line worker’s body belt, application of knots and hitches appropriate to the requirements of a line worker, height safety principles including personal fall protection, prevention and related requirements, and the practical procedure of climbing an overhead structure and fitting a pole chair
- Traffic management - purpose of traffic management and a line worker’s responsibilities in accordance with relevant statutory requirements and electricity supply industry requirements, demonstration of the procedure used to provide an effective traffic management scheme and the use of a two-way radio
- Control of small fires - identification, selection and operation of the appropriate extinguishing mediums for various types of fires, general fire prevention methods and the precautions for personal protection when fighting small fires
- Rescue victims from heights and confined spaces - planning, identifying, the procedures, and establishing responses, developing techniques, involvement of external emergency services and practical demonstration/rehearsals of rescuing a person from heights and from confined spaces and emergency procedures for the rescue of an electric shock victim including CPR
- Requirements for aerial linework - planning, establishing and implementing relevant aviation authority clearances, determining system requirements, aircrew familiarisation with network operations and equipment, requirements for effective communications operations for aerial work.

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**

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	Item List

	demonstrated	
A	Install and maintain at least one of the following:	Wood pole/structure Steel pole/structure Concrete pole/structure Composite pole/structure
B	With regards to "A" incorporate at least three of the following:	Insulators Cross arm braces Crossarms Pole steps Shackle straps Earth leads Traction supports Traction registration Bonding
C	With regards to "A" incorporate at least one of the following:	Baulking Stays Concreting including foundation
D	With regards to "A" incorporate at least one of the following:	Crane Auger/erector 'A' frame Lifting beam Pole pikes Helicopter lift
E	Erect any one of the following towers:	Pyramid Delta pi Enterprise specific type
F	With regards to "E" incorporate at least two of the following:	Insulators Clamps Bolts Structural components

G	With regards to "E" incorporate at least one of the following:	Welding Cleaning
H	Install and maintain at least one of the following:	Copper Aluminium Steel Composite Aluminium/steel reinforced Pilot
I	With regards to "H" incorporate at least two of the following:	Elevated work platform Portable platform Gondola Hook ladder* Elevated work box (*must do)
J	With regards to "H" incorporate at least five of the following:	Winches* Tension equipment* Stringing equipment Cable trailers Crimping equipment * Pre-formed splices Hardware Cable drum stands Ropes Rollers/ sheaves Comealongs Swivels (*must do)
K	With regards to "H" incorporate at least two of the following:	Voltage/ de-energised indicating device Field intensity meter Operating rods

		(*must do)
L	With regards to "H" incorporate at least one of the following:	Dynamometer Site board Abney level Sag chart* Theodolite (*must do)
M	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 erection of towers and associated equipment.

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 Transmission, Distribution and Rail Traction Industry. 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 transmission network infrastructure in accordance with the following:

Tower types may include pyramid, delta and pi and other enterprise specific types.

Equipment may include:

Pole types and structures may include wood, concrete, steel and composite.

Maintenance may include the basic inspection, removal, repair and replacement of poles including welding, pole staking and rebutting.

Associated hardware includes insulators, crossarms, stays, earth down leads and bond wires, crossarm braces, pole steps, shackle straps and associated bolts and clamps, cantilever assembly, pull off, head span, portal, drop tube

Pole stabilisation techniques include back-fill consolidation, concreting, baulking, reinforcement nailing, approved steel reinforcing and temporary and permanent stay-wires.

Methods of erection may include crane, auger/erector, winch/'A' frame, lifting apparatus and helicopter lift.

Installation and maintenance of overhead conductor and or cables used on transmission towers may include the stringing, tensioning, terminating, removal, repairing and replacement of the conductors/cables. Visual inspections and the diagnosing of faults is also included.

Structures include towers and columns.

Types of conductor include copper, aluminium, steel and composites. Conductor configurations may be single or bundled and include pilot cables.

Overhead conductors include earthing systems

Plant may include elevating work platform, winches and capstans, specialist tension stringing equipment, cable trailers, cable drum stands and equipotential equipment.

Testing and recording equipment includes, insulation resistance testers, recording meters and other approved devices and techniques applicable to the voltage.

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

RANGE STATEMENT

- Assessing risk
- Assessment
- Authorisation
- 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)

Transmission Units

