



Australian Government

Department of Education, Employment and Workplace Relations

UETDDRRT33A Maintain energised traction overhead electrical apparatus using glove techniques

Release: 1

UETTDRRT33A Maintain energised traction overhead electrical apparatus using glove techniques

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This Competency Standard Unit covers the maintenance and repair of energised traction overhead electrical apparatus via the use of approved live line glove and barrier techniques and includes the verification of site conditions and the potential hazards, the conformance with and calculation of physical loads, the selection of appropriate tools and equipment, and authorised work methods. It encompasses the undertaking of correct procedures and precautions to working live line in accordance with the work plan and enterprise requirements. It also includes the visual inspection and necessary checks to confirm that the electrical apparatus and components are in a safe condition to test and/or return to service, and the recommissioning tests of the electrical apparatus and components.

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 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 have been completed.

Pathway 1

Qualified and authorised Rail Traction Lineworker

Pathway 2

BSBWOR402A Promote team effectiveness

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
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
UETTDNIS52A	Install and maintain poles, structures and associated hardware
UETTDNIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTDNIS65A	Contribute to coordinated HV live working
UETTDRT21A	Install traction overhead wiring systems
UETTDRT22A	Maintain traction overhead wiring systems
UETTDRT23A	Install rail traction bonds
UETTDRT25A	Install overhead rail traction configurations
UETTDRT26A	Maintain overhead rail traction configurations
UETTDRT27A	Install overhead traction components and equipment
UETTDRT28A	Maintain overhead traction components and equipment
UETTDRT29A	Operate rail road traction height access equipment.

Prerequisite Unit(s) 4)

UETTDRT31A	Maintain energised d.c. traction overhead wiring system
UETTDRT99A	Test and verify rail traction installations

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
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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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare/plan to maintain energised traction overhead electrical apparatus (glove)	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 Calculation of physical loads and authorised work methods are obtained and 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.
	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 Hazards associated with the work and implement risk control measures including the rendering inoperative of automatic reclosing device are identified.
	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 Relevant personnel at worksite are confirmed current in First Aid, CPR, Pole Top and other rescue procedures according to requirements.
	1.9 Liaison and communication issues with other

ELEMENT	PERFORMANCE CRITERIA
	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.
2 Carry out the maintenance of energised traction overhead electrical apparatus (glove)	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, CPR, Pole Top and other Rescue Procedures and other related work procedures are performed according to requirements and/or established procedures.
	2.3 Lifting, climbing, and aloft, and use of power tools/equipment, techniques and practices are safely exercised according to requirements.
	2.4 Auto-reclose devices associated with the circuits being worked on have been rendered inoperative and necessary work documentation acquired in accordance with enterprise requirements.
	2.5 Essential knowledge and associated skills are applied in the safe maintenance of energised traction overhead electrical apparatus to ensure completion within an agreed timeframe and to quality standards with a minimum of waste according to requirements.
	2.6 Hazard warnings and safety signs are recognised

ELEMENT

PERFORMANCE CRITERIA

		and hazards and assessed OHS risks are reported to the immediate authorised persons for directions according to established procedures.
	2.7	Remedial actions are taken to overcome any shortfalls encountered in the work schedule according to requirements and/or established procedures.
	2.8	Solutions to non-routine problems are identified and actioned in the maintenance of energised traction overhead electrical apparatus using acquired essential knowledge and associated skills according to requirements and established procedures.
	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 and to a community/industry standard.
3	Complete the maintenance of energised traction overhead electrical apparatus (glove)	
	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 and followed up 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 documentation is signed off and, traction overhead electrical apparatus are returned to service, including returning of auto-reclosing device to normal, and advised to client/customer in accordance with requirements.
	3.6	Works completion records, reports, as installed

ELEMENT

PERFORMANCE CRITERIA

/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 of maintaining energised traction overhead electrical apparatus (glove) has been acquired.

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

KS01-TRT33A Energised traction overhead electrical apparatus using glove techniques

Evidence shall show an understanding of working on energised traction overhead electrical apparatus using glove techniques to an extent indicated by the following aspects:

T1 Working on energised lines to 33 kV using live line glove and barrier techniques encompassing:

- Commonwealth/State/Territory legislation, Standards, codes, Commonwealth/State/Territory legislation, supply authority regulations and or enterprise requirements associated with working on energised lines to 33 kV (poles) using live line glove and barrier techniques
- Safety precautions working on energised lines to 33 kV using live line HV rubber gloving techniques - live line minimum approach distances persons and plant, identification of OHS hazards, assessing and controlling risks, types, selection, maintenance, storage and uses of personnel protective equipment, live line access authority/permit system, disabling auto-reclosing function, ensuring functioning of fault current protective devices, checking integrity of insulation prior to work commencement, types and function of specialised live line working equipment and tools inspection before use, safe working policies, procedures and practices when using/operating specialised equipment and tools, methods of using specialised equipment and tools, work team communication, use of safety observers, emergency response and rescue including First Aid etc.
- Policies and procedures dealing with general work practices - definitions of terms used, responsibilities of personnel, types of structures from which glove and barrier methods can be performed, types of equipment and their compliance with relevant standards.
- Relationship between combined glove and barrier and stick methods - conditions under which they can be practiced.
- Techniques in installing and/or replacing HV insulators when working live line glove and barrier - intermediate insulators, angle insulators, bridging insulators, strain insulators and suspension insulators.
- Techniques in erecting and/or replacing HV cross-arms when working live line glove and barrier - intermediate, angle, strain, termination and suspension.
- Techniques in connecting and/or disconnecting HV bridges connections when working live line glove and barrier - strain/"Tee" bridges, bypass bridges/connections, HV A. B. C. and similar/dissimilar metals.
- Techniques in the installation and/or maintenance of electrical equipment - air

REQUIRED SKILLS AND KNOWLEDGE

break switches, gas switches, fuse assemblies, isolators, bird covers, surge diverters and fault indicators. Techniques in erecting and/or removing temporary midspan switching devices

- Techniques using live line glove and barrier to erect and/or replace of poles - intermediate, angle, strain.
- Techniques using live line glove and barrier for the repair and or replacing of HV conductors/cables
- Techniques in repairing and/or replacing HV armour rods and/or line guards
- Conversion methods using live line glove and barrier, of intermediate construction to strain construction.

T2 Working on energised lines to 33 kV (poles) using live line glove and barrier/hotstick combined encompassing:

- Commonwealth/State/Territory legislation, Standards, codes, supply authority regulations and or enterprise requirements associated with working on energised lines to 33 kV (poles) using live line glove and barrier/hotstick combined
- Safety precautions working on energised lines to 33 kV using live line glove and barrier/hotstick combined - live line minimum approach distances persons and plant, Occupational Health and Safety hazards and precautions, identification of OHS hazards, assessing and controlling risks, types, selection, maintenance, storage and uses of personnel protective equipment, live line access authority/permit system, disabling auto-reclosing function, ensuring functioning of fault current protective devices, checking integrity of insulation prior to work commencement, types and function of specialised live line working equipment and tools inspection before use, safe working policies, procedures and practices when using/operating specialised equipment and tools, methods of using specialised equipment, work team communication, use of safety observers, emergency response and rescue including First Aid etc.
- Policies and procedures dealing with general work practices for both glove and barrier/ hotstick combined, - definitions of terms used, responsibilities of personnel, types of structures from which glove and barrier methods can be performed, types of equipment and their compliance with relevant standards.
- Relationship between combined glove and barrier and stick methods - conditions under which they can be practiced.
- Techniques for installing and/or replacing HV insulators using glove and barrier/hotstick combined - intermediate insulators, angle insulators, bridging insulators, strain insulators and suspension insulators
- Techniques for erecting and/or replacing HV cross-arms using glove and barrier/hotstick combined - intermediate and angle
- Techniques for connecting and/or disconnecting HV bridges connections using glove and barrier/hotstick combined - strain/"Tee" bridges, bypass bridges/connections, HV A. B. C, HV and similar/dissimilar metals
- Techniques in the installation and/or maintenance of electrical equipment using hotstick - air break switches, gas switches, fuse assemblies, isolators, bird covers, surge diverters and fault indicators

REQUIRED SKILLS AND KNOWLEDGE

- Techniques in the erection and/or replacement of poles - intermediate/suspension, angle, strain and termination
- Techniques in repairing and/or replacing HV armour rods and/or line guards and/or conversion methods of intermediate construction to strain in construction
- Techniques in the repairing and replacing HV conductors/cables and the identification of equipment used
- Techniques in installing and/or maintaining switching devices using glove and barrier.

T3 Plant, equipment and tools used for HV live line work encompassing:

- Commonwealth/State/Territory legislation, Standards, codes, Commonwealth/State/Territory legislation, supply authority regulations and or enterprise requirements associated with plant, equipment and tools used for HV live line work.
- Safety precautions when working on plant, equipment and tools using hotstick combined - safe working clearances, Occupational Health and Safety hazards and precautions, identification of OHS hazards, assessing and controlling risks, types, selection, maintenance, storage and uses of personnel protective equipment, authorisation to work systems.
- Identification of plant, equipment and tools used for HV live line work – types, applications, construction, characteristics, limitations, safe working load.
- Serviceability of plant, equipment and tools used for HV live line work - inspection procedures, testing procedures, maintenance procedures, storage procedures.
- Relationship of live line work access authority/permit, disabling auto-reclose function and ensuring correct functioning of fault current protective devices prior to live line work.
- Live line access authorities, disabling auto-reclose function and ensuring fault current protective devices prior to live line work.
- Conductor supports – methods, types of equipment, construction, characteristics, limitations.
- Techniques in selecting appropriate conductor support method in accordance with requirements.
- Calculation of loads and wind loading on conductors.
- Effects of resultant forces when transferring conductor loads.
- Rigging procedures for conductor support equipment.

T4 Principles of high voltage encompassing:

- Commonwealth/State/Territory legislation, Standards, codes, Commonwealth/State/Territory legislation, supply authority regulations and or enterprise requirements associated with working on or near High Voltage
- Electrical and electrostatic principles related to high voltage lines - relationship of current, voltage and resistance as related to transmission lines, relationship of phase voltage and respective line voltages.

REQUIRED SKILLS AND KNOWLEDGE

- Production of an electric field – units, effect of distance, potential of an object within the field and the effect of distances to the potential.
- HV insulators - construction of a disc insulator, construction of a polymeric insulator, effects of an electrical field on disc insulators, identification of the number of disc insulators needed for a single line voltage, performance of a failed disc insulator on the line and the system.
- Determining the minimum allowable number of discs per string for each line voltage in the system before bare-hand work is to proceed
- Techniques in detecting a failed disc in a string
- Techniques in using appropriate tools and equipment to test a string
- Methods of recording data
- Effects of electrostatic induction on the human body - relationship of the resistance of a human body to different levels of current and voltage, relationship of a human body to an electric field, effects of electrostatic induction on bare-hand work.
- Application of Faraday's cage - effects of a body, advantages, description of the Faraday's cage used by bare-hand live-line workers
- Safety precautions working on or near High Voltage electrical apparatus - safe approach distances from live line, identification of OHS hazards, assessing and controlling risks, types, selection, maintenance, storage and uses of personnel protective equipment, permit to work systems and isolation procedures.
- Types and function of specialised live working equipment
- Safe working policies, procedures and practices when using and operating specialised equipment
- Methods of using specialised equipment
- Emergency response and rescue including First Aid etc
- Effects of lightning and switching surges on performance off string insulators - health effects to workers.
- Methods used to alleviate surges on transmission lines
- Magnetic field - difference between magnetic fields and electrostatic fields, source of magnetic field, techniques in locating, measuring and analysing known sources of magnetic fields, reasons for monitoring magnetic field exposure, techniques used to monitor magnetic fields.

T5 High voltage switching principles encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements applicable to switching of high voltage to a given schedule
- Requirements for the use of manuals, system diagrams/plans and drawings - types, characteristics and capabilities of electrical apparatus, use, characteristics and capabilities of specialised tools and testing equipment, network interconnectors source of possible backfeed
- Role of the HV switching operator
- Operational forms, access authorities and permits associated with HV switching - types of operational forms, access authorities and permits, purpose and procedure

REQUIRED SKILLS AND KNOWLEDGE

for operational forms, access authorities and permits.

- Use and operation of equipment associated with HV overhead and substation equipment - test instruments, sticks, interrupters, arc strangles.
- Types and categories of HV switchgear
- Application, function and operating capabilities of switchgear
- Restrictions pertaining to HV switching equipment
- Procedures for the isolation of HV transmission main and working earths
- Earthing HV electrical apparatus practices and procedures for access - purposes of “Operational” and additional work part “on-site” earths, factors determining the location and effectiveness of “Operational” earthing, acceptable industry procedures, personal protective equipment, high voltage switching techniques.
- Operate switching apparatus - identifying hazards, assessing and controlling risks associated with HV switchgear operation, systematic and defensive techniques, mobile radio procedures, double isolation procedures.

T6 High voltage fault switching principles encompassing:

- Primary causes, effects and types of HV electrical faults.
- HV protection devices - main components, types, categories, applications, functions.
- Basic principle of operation of HV system protection devices
- Protection co-ordination and protection “zoning”
- HV feeder auto-reclosing suppression – function, application.
- Circuit condition requirements and switching considerations when paralleling and separating HV feeders.

T7 High voltage distribution transformer principles encompassing:

- Operation of HV distribution transformers - principle governing factors for transformer ratings, protection and alarms, operating limitations and the relationship between transformer and HV fuse rating, purpose and principle operation of HV distribution transformer tap changers, HV distribution transformer and transformer — cable combination switching practices, paralleling requirements, isolation and earthing procedures for access, common distribution transformer and associated electrical apparatus faults.
- HV underground switching equipment - arc strangles, switch operation, load break elbows, switching cubicles, canister fuses, bayonet fuses, F and G switching cubicles, voltage indicators and phasing testers.

T8 High voltage SWER system encompassing:

- Application and function of SWER system components
- Circuit arrangement
- Principle of operation
- Hazards and procedures associated with faulty SWER earth systems
- Procedure to isolate, energise and commission SWER substations

REQUIRED SKILLS AND KNOWLEDGE

T9 Feeder automation system encompassing:

- Function of feeder automation system and the main components
- Operation procedure for a remote field device from a local control station
- Functions of “System Control and Data Acquisition” (SCADA) (or any other relevant Data Acquisition and Control) systems and its main components
- SCADA system security interlocks and access restrictions
- SCADA system operation when switching apparatus or retrieving data via a remote access device such as; Remote Access Terminal (RAT), Dial Up Voice Annunciated System and Local Control Station
- Function of the main components of a local/remote control system
- Operation of a field devices using SCADA systems via a Remote Access Terminal (RAT), Dial Up Annunciated System and Local Control Station.

T10 Safe working on energised HV AC and/or DC traction equipment encompassing:

- Commonwealth/State/Territory/local government legislation, Standards, codes, supply authority regulations and or enterprise requirements
- Safety precautions specific to working on energised LV DC Traction overhead conductors and cables - live line minimum approach distances, Occupational Health and Safety hazards and precautions, identification of hazards, assessing and controlling risks, types, selection, maintenance and uses of personnel protective equipment, live line permit system, disabling auto-reclosing function, ensuring functioning of fault current protective devices, checking integrity of insulation prior to work commencement, types and function of specialised live line working equipment and tools inspection before use, safe working practices when using specialised equipment and tools, methods of using specialised equipment, work team communication, use of safety observers, emergency response and rescue including First Aid etc.
- Techniques in the use of hotsticks for the maintenance of energised traction overhead apparatus
- Techniques in the use of glove and barrier on energised traction overhead apparatus.

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the range statement of the competency standard unit 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	Item List

	demonstrated	
A	At least one of the following:	Elevating work platform Insulated ladder Insulated mobile platform
B	At least two of the following:	Specialised tools Insulated gloves and barriers Tensioning equipment Geometry profiling equipment.
C	At least two of the following:	Air-break switches Insulators Surge arrestors Hardware and fittings
D	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 maintenance of energised traction overhead electrical apparatus (glove).

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 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)

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

UETTDROP1 Maintain overhead energised low voltage
2A conductors and cables

Range Statement

RANGE STATEMENT

10) This relates to the competency standard unit 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 energised traction overhead electrical apparatus by the adoption of live line gloves and barrier techniques, without the need to interrupt traction power supply during the course of work undertaking. Competency shall be demonstrated in relation to the maintenance, visual inspection and pre-commissioning tests of the overhead traction electrical equipment and components as well as associated hardware including ancillary equipment.

Maintenance may include the carrying out of diagnostics and tests on conductors, equipment, systems as well as the removal, repair and replacement of cables, conductors, and associated hardware and returning such to operational service.

Types of traction wire support structures may consist of portals, pull-off, drop-pieces, head spans, and cross spans.

Types of traction components may include switches, surge arresters, insulators, droppers, bay components, cantilever hardware, portal hardware, steady spans hardware, steady spans, insulators, pull-off arms, tension regulators, section insulators, neutral sections, air break switches, in span feeders, isolation switches, knuckles (insulated and non-insulated) and cross arms.

Traction system components may consist of metalwork, wires, hardware, fittings and insulators.

Types of conductor may include HD, CAD, and Tin Bearing copper, aluminium, steel, aluminium conductor steel reinforced, copper cover steel.

Types of wiring arrangements include single wire systems, simple and compound catenary systems.

Plant may include live-line tools, insulated ladders, insulated elevating work platforms/vehicles/trains, specialist tension string equipment, wire drums.

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 of work events, record keeping and or storage of information
- Drawings and specifications

RANGE STATEMENT

- 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)**

Rail Traction Units