



Australian Government

Department of Education, Employment and Workplace Relations

UETTD RTP33A Maintain energised transmission lines using Barehand technique on a helicopter platform

Release: 1

UETTD RTP33A Maintain energised transmission lines using Barehand technique on a helicopter platform

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This Competency Standard Unit covers the maintenance of energised high voltage transmission overhead electrical apparatus, i.e. live line work using Bare Hand techniques from a helicopter platform and includes the verification of the site conditions and the potential hazards, the conformation and calculation of physical loads and the selection of appropriate and authorised work method. It includes the preparation and cleaning of specialist material and tools in accordance with authorised technical instructions. It also encompasses the undertaking of OHS and safe working practices and the rendering inoperative of the automatic re-closing device including its restoration in accordance with the work plan and the procedure of issuing/accepting electrical access permits and or relevant work document.

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 Transmission Lineworker

Pathway 2

Unit Code	Unit Title
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

Prerequisite Unit(s)

4)

UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits
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
UETTD RIS54A	Install and maintain poles, structures, overhead conductors and cables
UETTD RIS65A	Contribute to coordinated HV live working
UETTD RTP26A	Install transmission structures and associated hardware
UETTD RTP27A	Maintain transmission structures and associated hardware
UETTD RTP29A	Install and maintain transmission overhead conductors and cables
UETTD RTP30A	Inspect transmission overhead structures and electrical apparatus
UETTD RTP31A	Maintain energised transmission lines using high voltage live work stick method
UETTD RTP32A	Maintain energised transmission lines using high voltage live work Barehand method
UETTD RTP99A	Test and verify transmission overhead 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

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 lines (transmission) using Bare Hand technique from a helicopter platform | 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 Work is prioritised and sequenced for the most efficient and effective outcome following |

ELEMENT

PERFORMANCE CRITERIA

- consultation with others for completion within acceptable timeframes, to a quality standard and in accordance with established procedures.
- 1.3 Risk control measures are identified, prioritised and evaluated against the work method.
- 1.4 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
- 1.5 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.
- 1.6 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 work site are confirmed current in First Aid, CPR, and other rescue procedures according to 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 instructed in respective responsibilities coordinated and authorised where applicable in accordance with established procedures.

ELEMENT	PERFORMANCE CRITERIA
2 Carry out the maintenance of energised lines (transmission) using Bare Hand technique from a helicopter platform	1.12 Positioning of road signs, barriers and warning devices is planned and coordinated in accordance with requirements.
	2.1 OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and actioned in accordance with requirements and/or established procedures.
	2.2 First Aid, CPR and other Rescue procedures and other related work procedures are performed according to requirements and/or established procedures.
	2.3 Lifting and 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 Maintenance of energised high voltage overhead electrical transmission apparatus 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 maintenance of energised high voltage overhead electrical transmission apparatus 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

ELEMENT

PERFORMANCE CRITERIA

		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 and to a community/industry standard.
3	Complete the maintenance of energised lines (transmission) using Bare Hand technique from a helicopter platform	3.1 Work is checked against schedule for conformance, anomalies reported 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 permit(s) (live line) are signed off and client/customer advised 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 maintaining energised lines (transmission) using Bare Hand technique on a helicopter platform.

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

KS01-TTP33A Energised transmission lines using Barehand Technique on a helicopter platform

Evidence shall show an understanding of working on energised lines for voltages up to and including 500 kV utilising the live barehand work method on a helicopter platform to an extent indicated by the following aspects:

T1 Working on energised lines at or above 132 kV using live line bare-hand techniques from a helicopter platform encompassing:

- Commonwealth/State/Territory legislation, Standards, codes, Commonwealth/State/Territory legislation, supply and aviation authority regulations and or enterprise requirements associated with extra high voltage (EHV) live line bare-hands work from a helicopter platform
- Safety precautions when working on helicopters - live line minimum approach distances including safe approach for selected helicopter type(s), Occupational Health and Safety hazards and precautions, determination of helicopter platform for task and working environment (i.e. network and relevant aircraft authority), identification of OHS hazards, assessing and controlling risks, types, selection, maintenance, storage and uses of personnel protective equipment, live line access authority/permit systems, 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 working equipment and tools, 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, pilot briefing requirements, emergency response and rescue including First Aid etc, techniques for working bare-hands on live line extra high voltage from a helicopter platform, aircraft operations induction including flight plan clearances, systems, equipment and communication requirements, types and functions of aerial attachment equipment including appropriate testing, rating and certification.
- Aircrew familiarisation with live-line systems operations and equipment requirements.

T2 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

REQUIRED SKILLS AND KNOWLEDGE

phase voltage and respective line voltages

- 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 lighting 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.

T3 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

REQUIRED SKILLS AND KNOWLEDGE

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**

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	All of the following:	Usage of a helicopter Usage of a platform
B	At least one of the following:	Replace/connect bridge/bonding connections Replace vibration damper Repair/replace conductor spacers Repair/replace conductor joint Repair conductor Application of helical splice
C	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 usage of the Bare Hand technique from a helicopter platform.

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)**

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 maintenance of conductors and hardware, the calculating of conductor load in tension. In addition the work shall include conductive clothing application and maintenance; working from a helicopter platform; working safely from a helicopter platform; safe working practises in and around aircraft.

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
- 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

RANGE STATEMENT

- Requirements
- Testing procedures
- Work clearance systems

Unit Sector(s)

Not applicable.

Competency Field

Competency Field	11)
	Transmission Units