



Australian Government

Department of Education, Employment and Workplace Relations

UETTDRIS60A Install and replace power system energy meters and associated equipment

Release: 1

UETTDRIS60A Install and replace power system energy meters and associated equipment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This Competency Standard Unit covers the installation and replacement of whole current energy meters and associated equipment, where replacement may include the identification of faults in accordance with established procedures and return to service. It includes the requirements to ascertain if normal functions of the meters and associated equipment are in accordance with established procedures.

Application of the Unit

Application of the Unit 2)

This Competency Standard Unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit may require a licence/registration to practice in the work place subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to Occupational Health and Safety, electricity/telecommunications/gas/water industry safety and compliance, industrial relations, environmental

License to practice

3)

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

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):

- Distribution Overhead
- Distribution Cable Jointing
- Electrotechnology Electrician
- Common Unit Group

Unit Code	Unit Title
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. Circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. Circuits

Prerequisite Unit(s)

4)

UETTDREL16A Working safely near live electrical apparatus

Distribution Overhead Pathway Group

Unit Code Unit Title

UETTDROP12A Maintain overhead energised low voltage conductors and cables

UETTDREL11A Apply sustainable energy and environmental procedures

UETTDREL12A Operate plant and equipment near live electrical conductors and apparatus

UETTDRLS41A Install network infrastructure electrical equipment

UETTDRLS42A Maintain network infrastructure electrical equipment

UETTDRLS52A Install and maintain poles, structures and associated hardware

UETTDRLS54A Install and maintain poles, structures, overhead conductors and cables

UETTDRLS56A Install and maintain low voltage overhead services

Distribution Cable Jointing Pathway Group

Unit Code Unit Title

UETTDRCJ21A Lay ESI electrical cables

UETTDRCJ26A Install and maintain de-energised low voltage underground polymeric cables.

UETTDRCJ27A Install and maintain de-energised high voltage underground polymeric cables.

UETTDREL11A Apply sustainable energy and environmental procedures

Prerequisite Unit(s)

4)

UETTDREL12A Operate plant and equipment near live electrical conductors and apparatus

UETTDNIS41A Install network infrastructure electrical equipment

UETTDNIS42A Maintain network infrastructure electrical equipment

UETTDNIS55A Install and maintain low voltage underground services

Electrotechnology Electrician Pathway Group

Unit Code

Unit Title

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

UEENEEG103A Install low voltage wiring and accessories

UEENEEG104A Install appliances, switchgear and associated accessories for low voltage 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

Prerequisite Unit(s) 4)

circuits

UEENEEG109A Develop and connect electrical control circuits

UEENEEK142A Apply environmentally and sustainable energy procedures in the energy sector

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 “Literacy and Numeracy”

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills 5)

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare for the installation and replacement of energy meters and associated equipment	1.1 Works schedule(s), including drawings, plans, requirements, established procedures, and material lists, are received, analysed and confirmed, if necessary, by site inspection.
	1.2 Relevant requirements and established procedures for the work are communicated to all personnel and identified for all work sites.
	1.3 OHS policies and procedures related to requirements and established procedures for the installation and replacement of energy meters and associated equipment are obtained and confirmed for the purposes of the work to be performed and communicated.
	1.4 Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures.
	1.5 Hazards are identified, OHS risks assessed and control measures are prioritised, implemented and monitored including emergency exits kept clear according to established procedures.
	1.6 Resources including personnel, equipment, tools and Resources including personnel, equipment, tools and personnel protective equipment required for the job are obtained and confirmed in working order.
	1.7 Relevant personnel at worksite are confirmed current in First Aid, Rescue and other related work procedures according to requirements.
	1.8 Liaison and communication issues with other/authorised personnel, authorities, clients and land owners are resolved to carry out work where necessary.
	1.9 Site is prepared according to the work schedule and to minimise risk and damage to property, commerce, and individuals in accordance with established procedures.

ELEMENT

PERFORMANCE CRITERIA

- | | | |
|---|--|---|
| | 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 | Road signs, barriers and warning devices are positioned in accordance with requirements. |
| 2 | Carry out the installation and replacement of energy meters and associated equipment | |
| | 2.1 | OHS and sustainable energy principles and practices to reduce the incidents of accidents and minimise waste are monitored and followed in accordance with requirements and/or established procedures. |
| | 2.2 | Lifting, and use of power tools/equipment, techniques and practices are safely followed and, currency according to requirements confirmed. |
| | 2.3 | Essential knowledge and associated skills are applied in the safe installation and replacement of energy meters and associated equipment to ensure completion in an agreed timeframe and, to quality standards with a minimum of waste according to requirements. |
| | 2.4 | Installation and/or replacement of energy meters and associated equipment is carried out, including, as required, wiring, testing, programming and sealing and of meter(s) and associated equipment in accordance with requirements and enterprise requirements. |
| | 2.5 | 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. |
| | 2.6 | Unplanned events during the installation and replacement of energy meters and associated equipment are undertaken within the scope of established procedures. |
| | 2.7 | Known solutions to a variety of problems are applied using acquired essential knowledge and associated skills. |

ELEMENT	PERFORMANCE CRITERIA
	2.8 Ongoing checks of quality of the work are undertaken in accordance with instructions and established procedures.
3 Complete the installation and replacement of energy meters and associated equipment	3.1 Work undertaken is checked/tested 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 in accordance with established procedures.
	3.5 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 installing and replacing energy meters and associated equipment.

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

KS01-TIS60A Power system energy meters and associated equipment

Evidence shall show an understanding of the installation and/or replacement power system energy meters and associated equipment to an extent indicated by the following aspects:

T1 Cable protection and support method and accessories encompassing:

- Requirements to protect and support cables adequately - protection against mechanical damage, protection from adverse temperatures and corrosion and protection from magnetic field that may affect the performance of the cable.
- Cable support and protection devices, accessories and typical applications - metallic and non-metallic conduits, duct and trunking, cable ladder and tray, cable clips and ties and related accessories.
- Installation techniques - cable installation equipment, cable drawing and hauling techniques.

T2 Types of cables used in electrotechnology and their application encompassing:

- Structural components of cables and their purpose - conductors and conductor material; insulation; sheathings and servings.
- Application of various cables types
- Cable varieties - single cables, flexible cables, flexible cords, shielded cables, armoured cables, ribbon cables, other similar and like cables
- Typical characteristics and use of power circuit cables and control circuit cables

T3 Installing cables in buildings, structures and premises encompassing:

- Building construction method and construction sequence.
- Typical cable routes through buildings, structures and premises.
- Building codes affecting the installation of cables in buildings, structures and premises - limitation on penetration structural elements and maintenance of fire protection interiority
- Cable segregation requirements

T4 Basic cable and conductor terminations encompassing:

- Insulation removal and replacement
- Conductor handling and cable terminations - general aspects and soldering involving pins on electronic components and stranded conductors carrying current up to 25 amperes, application of connecting devices for conductors and terminals, continuity through connections and insulation resistance testing, stress release on cables/conductors.

REQUIRED SKILLS AND KNOWLEDGE

T5 Power cable and conductor terminations encompassing:

- Types of cable glands and their application - glands for circular sheathed cables; steel wire armoured (SWA) cables and mineral-insulated metal-sheathed (MIMS) cables.
- Cable termination techniques
- Terminal types and applications
- Conductor termination techniques - need for sound termination, consequences of poor conductor termination, conductor and terminal preparation.

T6 Telecommunication cable and conductor terminations encompassing:

- Approved termination devices and sockets.
- Special termination tools and their use.
- Cable colour coding up to 100 pair indoor and outdoor cable
- End to end testing
- Methods of terminating cables - cables less than twenty pair, twenty pair cable and greater
- Cable labelling devices
- Colour coding of cables, sockets and termination modules and standard connectors used with twisted pair, optical fibre and coaxial cables

T7 Terminating cable and conductor used in electronic equipment encompassing:

- Cable and conductor types and characteristics - insulated wire, harness wiring, high performance cables (transmission performance parameters and electrical characteristics)
- Types include UTP, FTP, and STP
- Coaxial cables types and characteristics - types include qualshield, trishield coaxial are armour plated coaxial cables
- Cable anchoring and support methods
- Termination methods

T8 Installation of metering and control equipment encompassing:

- Standards, codes, legislation, supply authority regulations and or enterprise requirements pertaining to the installation and maintenance of energy meters and associated equipment
- Types of meters - kilowatt-hour meters single and polyphase, demand meters, recording meters and electronic recording metering systems summators
- Installation and removal methods - direct connection and plug in method, enterprise specific
- Types of associated equipment and accessories - meter boards, service fuse, links, contactors, time switch, audio frequency injection relay
- Testing procedures - safety testing, polarity testing

T9 Powerline safety practices encompassing:

- Protective apparatus and apparel for linework - responsibilities for the selection,

REQUIRED SKILLS AND KNOWLEDGE

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 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	Any one of the following:	Induction disk energy meter Electronic energy meters Maximum demand meters Electronic summators
B	At least one of the following:	Service fuses Service links Meter boards Meter panels
C	At least one of the following:	Time switches Frequency injection relays Controlled output meters Contactors
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 installation and replacement of energy meters 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 Industry to which this Competency Standard Unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

**Concurrent
assessment and
relationship with
other units**

9.5)

There are no concurrent assessment recommendations for this unit.

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the installation and replacement of whole current energy meters and associated equipment, where replacement may include the identification of faults and the return to service.

Installation may include single and polyphase meters and associated equipment.

Replacement may include the removal and return to service of ‘like for like’ energy meters and associated equipment in a variety of environments and contexts.

Associated equipment includes load control devices such as time switches and audio frequency injection relays, plug in meter bases, service fuses and links, contactors and meter boards and panels where the installation uses direct-wired (non-current transformer) metering.

Meters include induction disc energy meters, electronic energy meters, maximum demand meters, electronic summators, time switches and relays, provided that they are basic direct-wired instruments. Current transformer metering is not included.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section 1 of this volume and form an integral part of the Range Statement of this unit:

- Appropriate and relevant persons (see Personnel)
- Appropriate authorities
- Appropriate work platform
- Assessing risk
- Assessment
- Authorisation
- Confined space
- Diagnostic, testing and restoration
- Documenting detail work events, record keeping and or storage of information
- Drawings and specifications
- Emergency
- Environmental and sustainable energy procedures
- Environmental legislation
- Environmental management documentation
- Established procedures
- Fall prevention
- Hazards
- Identifying hazards
- Inspect
- Legislation

RANGE STATEMENT

- 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)**

Industry Specific Cross-Discipline Units