



Australian Government

UETTD RIS67 Solve problems in energy supply network equipment

Release: 1

UETTDRI67 Solve problems in energy supply network equipment

Modification History

Release 1. This is the first release of this unit of competency in the UET Transmission, Distribution and Rail Sector Training Package.

Application

This unit involves the skills and knowledge required to solve problems in energy supply network equipment in the electricity supply industry (ESI).

It includes determining correct operation of energy supply network electrical equipment and providing solutions. It also includes working safely, reading circuit and reticulation diagrams, applying problem solving processes from measurements and completing the necessary documentation.

The application of the skills and knowledge described in this unit may require a licence to practice in the workplace.

Other conditions may apply under State and Territory legislative and regulatory licensing requirement which must be confirmed prior to commencing this unit.

Pre-requisite Unit

Common Unit Group

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

UEENEEG006A Solve problems in single and three phase low voltage machines

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

Competency Field

Industry Specific Cross Discipline

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to solve problems in energy supply network equipment

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 Work health and safety (WHS)/occupational health and safety (OHS) procedures for a given work area are identified, obtained and understood

1.2 Extent of work to be undertaken is determined from reports and/or discussions with relevant person/s

1.3 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others

1.4 Materials required for work are determined in accordance with workplace procedures

1.5 Tools, equipment and testing devices required to take measurements are obtained in accordance with workplace procedures and checked for correct operation and safety

2 Solve problems in energy supply network equipment

2.1 WHS/OHS risk control measures and procedures for carrying out the work are followed

2.2 The need to test or measure live work is determined in accordance with WHS/OHS requirements and, when necessary, conducted in accordance with workplace safety procedures

2.3 Circuits/machines/plant are isolated, where necessary, in accordance with WHS/OHS requirements and workplace procedures

2.4 Safety hazards resulting from reports and risk control measures devised and implemented in consultation with appropriate personnel

2.5 Problem solving of energy network equipment is approached methodically using measured and calculated

	values of circuit/apparatus parameters
2.6	Circuit/apparatus components are dismantled, where necessary, and parts stored to protect them against loss or damage
2.7	Circuits/components are rechecked and their operational status is confirmed
2.8	Materials/replacement parts required to solve problems are sourced and obtained in accordance with workplace procedures
2.9	Effectiveness of the repair is tested in accordance with workplace procedures
2.10	Apparatus is reassembled, tested and prepared for return to service
2.11	Unplanned events are dealt with safely and with the approval of relevant personnel
2.12	Problem-solving activities are completed without damage to apparatus, circuits, the surrounding environment or services applying sustainable energy practices
3 Complete and report on problem solving in energy supply network equipment	3.1 WHS/OHS work completion risk control measures and procedures are followed
	3.2 Reusable, faulty or worn components are tagged and dispatched for repair to maintain adequate spares
	3.3 Maintenance work activities are documented in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the Companion Volume Implementation Guide.

Unit Mapping Information

This unit replaces and is equivalent to UETTDRIS67A Solve problems in energy supply network equipment.

Links

UET Training Package Companion Volume Implementation Guide is found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=229bace1-b7bc-4653-9300-dffb13ecfad7>

Assessment Requirements for UETTDRIS67 Solve problems in energy supply network equipment

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria on at least two separate occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including the use of risk control measures
- applying sustainable energy principles and practices
- solving problems in energy supply network equipment, including:
 - determining the operating parameters of existing energy supply equipment
 - envisaging the likely extent of work from reports and discussions with appropriate personnel
 - using methodical problem-solving techniques
 - solving problems efficiently
 - altering an existing energy supply equipment to comply with specified operating parameters
 - developing energy supply equipment to comply with a specified function and operating parameters
 - determining conditions causing an existing energy supply equipment to be unsafe
 - completing documentation correctly
- solving problems in energy supply network equipment on at least one (1) of the following energy supply network systems:
 - distribution overhead system
 - distribution underground system
 - transmission overhead system
 - transmission underground system
- using at least three (3) of the following distribution/transmission equipment:
 - voltage regulation equipment
 - on load tap changers
 - energy metering
 - demand meters
 - load control

- current transformers
- potential transformers
- dealing with unplanned events on at least one (1) occasion.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases, the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- generation, including:
 - primary energy sources
 - power stations
 - power station output
 - acts and legislation relating to generation
 - renewable energy sources and techniques
- transmission, including:
 - system requirements
 - principal components of a power system
 - voltage levels
 - grid systems
 - acts/legislation relating to transmission
 - future trends
- distribution, including:
 - high voltage (HV) distribution systems
 - medium/low voltage (LV) distribution systems
 - radial feeders
 - parallel feeders
 - ring main feeders
 - acts/legislation relating to distribution
- substations, including:
 - purpose
 - location
 - layout
- overhead and underground systems, including:
 - relative merits
 - applications

- planning
- installation
- power distribution system electrical characteristics, including:
 - transmission and distribution systems
 - inductance, capacitance and resistance
- voltage problems in a power distribution system, including:
 - LV
 - unbalanced voltages
 - voltage rises
- voltage regulation, including:
 - autotransformers with on-load tap changer (OLTC)
 - transformers with OLTC
 - static capacitors
 - load control
- control of OLTC, including:
 - regulation relays
 - control circuits
 - line drop compensation
- power distribution system faults, including:
 - type/classification of fault
 - typical causes/effects of faults
 - three phase symmetrical fault levels
 - fault level limitation
- voltage surges in a power distribution system, including:
 - lightning surges
 - switching surges
 - typical surge levels
 - surge impedance, typical values
 - significance of the system surge impedance
- metering and metered quantities, including:
 - purpose
 - energy
 - maximum demand
 - accuracy classes for metering systems
- energy and demand meters, including:
 - construction
 - operation
 - adjustments
 - testing
- metering circuits, including:

- direct metering
- instrument transformer metering
- electronic metering systems and recording meters, including:
 - types
 - applications
 - connections
- load control, including:
 - purpose
 - methods.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated conditions involving realistic and authentic activities that replicate operational workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, facilities, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, relevant industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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