



Australian Government

UEEEL0047 Identify, shut down and restart systems with alternate supplies

Release: 2

UEEEL0047 Identify, shut down and restart systems with alternate supplies

Modification History

Release 2. This is the second release of this unit of competency in the UEE Electrotechnology Training Package.

Assessor requirements updated in Assessment Conditions.

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to identify, shut down and restart systems with alternate supplies.

It includes identifying the system configuration, working safely with electricity generation systems and inverters, identifying hazards and controlling the associated risks, isolation and testing for de-energisation, reinstating the system after isolation, and completing relevant documentation.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, a relevant contract of training, such as an Australian Apprenticeship, may be required.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Pre-requisite Unit

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

UEECD0019 Fabricate, assemble and dismantle utilities industry components

UEECD0020 Fix and secure electrotechnology equipment

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications

UEEEL0003 Arrange circuits, control and protection for general electrical installations

UEEEL0020 Solve problems in low voltage a.c. circuits

UEEEL0023 Terminate cables, cords and accessories for low voltage circuits

UEEEL0019 Solve problems in direct current (d.c.) machines

UEEEL0021 Solve problems in magnetic and electromagnetic devices

and

UEECD0043 Solve problems in direct current circuits

or

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits

Competency Field

Electrical

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to work on systems with alternate supplies

2 Identify and isolate alternate supplies

PERFORMANCE CRITERIA

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

- 1.1** Nature of the installation is obtained from appropriate written documentation, electrical drawings and/or relevant person/s to determine the scope of work
- 1.2** WHS/OHS workplace procedures are obtained, interpreted and applied
- 1.3** Hazards are identified, risks are assessed, and control measures are implemented
- 1.4** Tools, equipment and circuit testing devices are obtained and checked for correct operation and safety in accordance with workplace procedures
- 1.5** Work supervisor is consulted to ensure work is coordinated effectively with others
- 2.1** Labelling indicating generation system/s connected on site is located, interpreted and checked against electrical diagrams

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|----------|---|---|
| | 2.2 | Switchboard, circuits and known supply are identified |
| | 2.3 | Site procedures for isolation and shutdown are obtained and interpreted |
| | 2.4 | Circuit to be isolated is identified and tested |
| | 2.5 | Shutdown procedures are completed in accordance with industry standards and workplace procedures |
| | 2.6 | Isolation of energy sources is completed and proved in accordance with workplace procedures, industry standards and regulatory requirements |
| | 2.7 | Systems are inspected and tested for compliance with industry and regulatory standards |
| | 2.8 | Battery storage system integrity is checked in accordance with industry standards and regulatory requirements |
| | 2.9 | System is re-instated after isolation |
| 3 | Complete work and document records | |
| | 3.1 | WHS/OHS work completion risk control measures and procedures are followed |
| | 3.2 | Worksite is cleaned and made safe in accordance with workplace procedures |
| | 3.3 | Work completion is documented, electrical drawings are updated, and relevant personnel are notified in accordance with workplace procedures and regulatory requirements |

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 UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Identifying, shutting down and restarting

- one with an energy source that is still

systems must include electricity generation systems and electricity converters relevant to the installation type, including:

- available once turned off; and
- one inverter energy system
- AND, at least two of the following:
 - grid-connected inverter systems
 - photovoltaic (PV) array systems
 - micro-inverters
 - engine-driven generating sets
 - stand-alone power systems
 - battery systems

Unit Mapping Information

No equivalent unit.

Links

Companion Volume Implementation Guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEEEL0047 Identify, shut down and restart systems with alternate supplies

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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, performance criteria and range of conditions on at least two separate occasions and include:

- applying work health and safety (WHS)/occupational health and safety (OHS) workplace procedures
- identifying and assessing hazards and risks, including hazards based on supply system labelling, and implementing control measures
- obtaining and checking required tools, equipment and testing devices
- reading and interpreting electrical documentation, labelling and drawings
- identifying alternative supply arrangements and configurations
- applying safe shutdown procedures
- isolating energy sources in accordance with workplace procedures and regulatory requirements, including:
 - applying safe isolation practices
 - identifying correct isolation device
 - identifying and checking operation of control device/s
 - identifying live conductors
 - identifying known source of electromotive force (EMF) for testing purposes
 - correctly using a voltage tester
 - isolating multiple supplies, where required
 - isolating under no loads
 - ensuring all energy sources are isolated
 - de-energising charging sources, including:
 - solar charge controllers
 - battery chargers
 - proving systems are isolated
 - tagging-out all supplies

- ensuring all installation work complies with relevant industry standards and legislation to which the selection, installation and control equipment of each type of system must comply
- checking battery storage system integrity is in accordance with industry standards and regulatory and manufacturer requirements, including ventilation, correct isolation devices and installation position
- safely re-instating generation system to operational mode according to site documentation and manufacturer instructions
- completing required documentation and forwarding to relevant parties.

Knowledge Evidence

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

- working safely with alternate supplies, including identifying hazards and controlling risks in compliance with regulatory and enterprise requirements
- main types, arrangements and configurations of alternative supplies (generating system), including renewable and non-renewable generating systems
- fundamental requirements, including:
 - connection methods of alternative supplies
 - local supply authority requirements
 - characteristics and operation of uninterruptable power supplies (UPS)
 - direct current (d.c.) polarity requirements, including switching, correct rating of d.c. switches and protection devices
 - importance of replacing components like-for-like
 - inverter principles, including operation and interaction with the installation, anti-islanding and islanding requirements and testing requirements
 - identification and labelling requirements and their purpose
 - arrangement for connecting an alternative supply to an installation, including automatic and manual changeover switches, multiple main switches and switchboard wiring
 - earthing arrangements, including equipotential bonding, and earthing methods and requirements for stand-alone systems and generators
- safe isolation of the generator/energy source, including:
 - anti-islanding
 - auto changeover/auto start
 - backup – external power supply (EPS)/UPS mode or backup mode
 - earth fault alarm
 - voltage rise
 - voltage parameters AS/NZS 4777 Grid connection of energy systems via inverters
 - no loads
 - deenergising charging sources such as solar charge controllers, and battery chargers
 - AS/NZ 4836 Safe working on or near low-voltage electrical installations and equipment

- labelling and identification of alternate supply systems
- battery storage systems, including regulatory and manufacturer requirements
- relevant industry standards to which the selection, installation and control equipment of each type of system must comply, including:
 - AS/NZS 3000 Electrical installations (known as the Australian/New Zealand Wiring Rules) relating to the requirements for electricity generation systems installation and electricity converters
 - AS/NZS 4777(series) Grid connection of energy systems via inverters
 - AS/NZS 5033 Installation and safety requirements for photovoltaic (PV) arrays
 - AS/NZS 3010 Electrical installations - generating sets
 - AS/NZS 4509 (series) Stand-alone power systems
 - AS 3011 Electrical installations - Secondary batteries installed in buildings
 - AS/NZS 5139 Electrical installations - Safety of battery systems for use with power conversion equipment
- site and regulatory documentation requirements.

Assessment Conditions

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

Assessors must also hold the occupational licence for the jurisdiction the assessment is occurring where the activity being assessed requires a licence to practice.

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 workplace operational situations that replicate 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, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, manufacturer instructions, regulations, codes of practice and operation manuals.

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