



**Australian Government**

# **UETDRSB011 Maintain high current d.c. equipment and switchgear**

**Release: 1**

# UETDRSB011 Maintain high current d.c. equipment and switchgear

## Modification History

Release 1. This is the first release of this unit of competency in the UET Transmission, Distribution and Rail Sector Training Package Release 4.0.

## Application

This unit includes the skills and knowledge required to maintain high current direct current (d.c.) equipment and switchgear in the electricity supply industry (ESI).

It includes d.c. circuit breakers, rectifier transformers, rectifiers, isolators and links, harmonic filters, negative reactors, and energy dissipation resistors.

It also includes diagrams, drawings, manuals, specialised tools, and testing equipment.

*Note: Entry into this unit is for users who:*

- *hold the unit UETDREL005 Work safely in the vicinity of live electrical apparatus or equivalent,*
- and*
- *hold an Electrician licence or the equivalent issued in an Australian state or territory,*
- or*
- *hold an Electrician qualification or the equivalent issued in an Australian state or territory.*

*This unit can be undertaken in conjunction with the qualification listed above, provided all requirements for completion of the Certificate III qualification are met prior to issuing this unit.*

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

Other conditions may also apply under state and territory legislative and regulatory licensing requirements which must be confirmed prior to commencing this unit.

## Pre-requisite Unit

Refer to Application.

## Competency Field

Substation

## Unit Sector

Not applicable.

## Elements and Performance Criteria

### ELEMENTS

Elements describe the essential outcomes.

### PERFORMANCE CRITERIA

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

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|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1 Prepare to maintain high current d.c. switchgear and equipment</b> | <b>1.1</b> Legislation, regulations, standards, codes of practice and organisational workplace requirements for the work to be done are reviewed and determined<br><br><b>1.2</b> Work plan is obtained and confirmed in accordance with workplace requirements, and where relevant, communicated to the appropriate personnel<br><br><b>1.3</b> Hazards are identified, risks assessed, and control measures identified and applied<br><br><b>1.4</b> Work is prioritised and sequenced for completion in accordance with work plan and workplace requirements<br><br><b>1.5</b> Plant, tools, equipment and personal protective equipment (PPE) required for work are determined, obtained and confirmed in working order<br><br><b>1.6</b> Work permits are determined in accordance with workplace requirements<br><br><b>1.7</b> Liaison and communication issues with authorised personnel, authorities and clients are resolved to facilitate work, as required<br><br><b>1.8</b> Worksite is prepared in accordance with the work plan and workplace requirements |
| <b>2 Maintain high current d.c. switchgear and equipment</b>            | <b>2.1</b> Legislation, regulations, standards, codes of practice and organisational workplace requirements for the work to be performed are applied and monitored<br><br><b>2.2</b> Work permits are received and signed in accordance with workplace requirements<br><br><b>2.3</b> Lifting, working at heights, working in confined spaces and the use of plant, tools, equipment and PPE are                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

- carried out in accordance with workplace requirements
- 2.4 High current d.c. switchgear and equipment is maintained in accordance with workplace requirements
  - 2.5 Quality checks of work are undertaken in accordance with work plan and workplace requirements
  - 2.6 Incidents or unplanned events are responded to in accordance with workplace requirements
- 3 Complete work and documentation**
- 3.1 Completed work is checked for compliance against the work plan and workplace requirements
  - 3.2 Work permits are signed off in accordance with workplace requirements
  - 3.3 Worksite is rehabilitated, cleaned and made safe in accordance with workplace requirements
  - 3.4 Plant, tools and equipment are cleaned, checked and returned to storage, and surplus resources and materials are managed in accordance with workplace requirements
  - 3.5 Work records, reports and documentation are completed, and where relevant, appropriate personnel notified in accordance with workplace 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 UET Transmission, Distribution and Rail Sector Training Package Companion Volume Implementation Guide.

## Unit Mapping Information

This unit replaces and is not equivalent to UETDRSB27 Maintain high current d.c. equipment and switchgear.

## Links

Companion Volume Implementation Guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=229bace1-b7bc-4653-9300-dffb13ecfad7>

# Assessment Requirements for UETDRSB011 Maintain high current d.c. equipment and switchgear

## Modification History

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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 (2) separate occasions and include:

- applying relevant legislation, regulations, standards, codes of practice and organisational workplace requirements including:
  - work health and safety (WHS)/occupational health and safety (OHS) requirements
- identifying hazards, assessing risks, and identifying, applying and monitoring control measures
- obtaining, inspecting and using relevant personal protective equipment (PPE)
- dealing with an unplanned event on at least one (1) occasion
- obtaining and signing relevant work permits in accordance with workplace requirements
- completing relevant work records, reports and documentation
- using at least five (5) of the following testing equipment on at least one (1) occasion:
  - ammeter
  - voltmeter
  - insulation resistance tester
  - micro-ohm tester
  - multimeter
  - drop-out tester
- using drawings and diagrams including all of the following:
  - building layouts
  - cable block diagrams
  - cable schedules
  - operating and substation arrangement diagrams
  - wiring diagrams and schematic drawings
- maintaining high current direct current (d.c.) equipment and switchgear on at least six (6) of the following types:
  - d.c. circuit breaker
  - rectifier transformer
  - rectifier

- isolator and link
- harmonic filter
- negative reactor
- energy dissipation resistor
- maintaining high current d.c. associated equipment on at least ten (10) of the following:
  - d.c. feeder
  - surge arrester
  - isolating link
  - busbar
  - cable
  - cable support
  - pit and enclosure
  - protection/alarm system
  - control wiring
  - metering
  - supervisory interface
  - cabinet
  - rail earth contactor (REC)
- maintaining protection using at least three (3) of the following types:
  - buchholz
  - frame leakage
  - overcurrent
  - earth leakage
  - reverse current
  - delta I
  - diode protection.

## 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:

- relevant legislation, regulations, standards, codes of practice and organisational workplace requirements, including WHS/OHS requirements
- hazard, risk assessment and risk control requirements, including potential hazards
- types and application of PPE
- safe use of plant, tools and equipment
- application, purpose and types of permits
- events constituting an unplanned event or incident
- procedures for responding to an unplanned event or incident
- workplace records, reports and documentation

- work on energised systems
- diagrams, drawings, and manuals, including:
  - electrical and mechanical drawings
  - operating and substation arrangement diagrams
  - manufacturers' manuals
- specialised tools, including:
  - types, construction and function
  - calibration
  - care and maintenance
- testing equipment, including:
  - types, construction and function
  - calibration
  - care and maintenance
- high current d.c. equipment, associated equipment and switchgear, including:
  - types, construction and function
  - maintenance procedures
  - procedures for checking maintenance tasks for compliance
- high current d.c. protection equipment:
  - types, construction and function
  - maintenance procedures
  - checking maintenance tasks for compliance.

## 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:

- relevant and appropriate materials, tools, equipment and PPE currently used in industry
- applicable documentation, including workplace requirements, equipment specifications, regulations, codes of practice and operation manuals.

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