



**Australian Government**

# **UETTDRSB35 Maintain discrete control and protection systems**

**Release: 1**

# UETTDRSB35 Maintain discrete control and protection systems

## 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 covers the isolation, inspection, testing, adjustment, repair, refurbishment and/or overhaul and functional checks of discrete protection and control devices. It includes the requirements to prove the functionality of discrete devices, such as direct current (d.c.) supplies, overcurrent, overload, earth fault, transformer temperature controls, alarms and indication circuits.

The application of the skills and knowledge described in this unit requires a licence/registration to practice in the workplace subject to regulations for undertaking of electrical work.

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

## Pre-requisite Unit

All competencies in the Common Unit Group must have been completed, plus all competencies in one (1) of the identified Pathway Unit Group(s).

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

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 low voltage electrical apparatus and circuits

UEENEEG063A Arrange circuits, control and protection for general electrical installations

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage a.c. circuits

UEENEEG106A Terminate cables, cords and accessories for low voltage circuits

UEENEEG108A Trouble-shoot and repair faults in low voltage electrical apparatus and circuits

UEENEEG109A Develop and connect electrical control circuits

UEENEEK142A Apply environmentally and sustainable procedures in the energy sector

Pathway 1 - Electrician

UEENEEG103A Install low voltage wiring and accessories

UEENEEG104A Install appliances, switchgear and associated accessories for low voltage electrical installations

UEENEEG105A Verify compliance and functionality of low voltage general electrical installations

UEENEEG107A Select wiring systems and cables for low voltage general electrical installations

Pathway 2 - Electrical Fitter

UEENEEG199A Conduct compliance and functional verification of electrical apparatus and existing circuits

## Competency Field

Substation

## Unit Sector

Not applicable.

## Elements and Performance Criteria

### ELEMENTS

Elements describe the essential outcomes.

#### **1 Plan for the maintenance of discrete protection and control devices**

### PERFORMANCE CRITERIA

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

- 1.1** Work schedules, including drawings, plans, requirements procedures and material lists, are acquired, analysed and the extent of work determined
- 1.2** Relevant requirements and established procedures for the work are communicated to all personnel and identified for all worksites
- 1.3** Hazards are identified, work health and safety (WHS)/occupational health and safety (OHS) risks assessed and control measures prioritised, implemented and monitored, including emergency exits kept clear, to

ensure safe systems of work are followed and according to established procedures

- 1.4** Work is prioritised and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to agreed quality standards and in accordance with established policies and procedures
- 1.5** Risk control measures are identified, prioritised, implemented and evaluated against the work schedule
- 1.6** Resources, including personnel, equipment, tools and personal protective equipment (PPE), required for the job are identified, acquired and confirmed safe and in technical working order
- 1.7** Liaison issues with other personnel and/or authorities are resolved and activities coordinated to facilitate the work
- 1.8** Personnel participating in the work, including plant operators and contractors, are fully briefed, their respective responsibilities explained and coordinated, and appropriate authorisation checked in accordance with established procedures
- 1.9** Worksite is prepared according to the work schedule and to minimise risk and damage to property and personnel in accordance with established procedures

## **2 Carry out the maintenance of discrete protection and control devices**

- 2.1** WHS/OHS and sustainable energy principles and practices to reduce the incidence of accidents and minimise waste are implemented and monitored in accordance with established procedures
- 2.2** Cardiopulmonary resuscitation (CPR), rescue from live electrical apparatus and other related safety procedures are in place according to requirements and established procedures
- 2.3** Safe working documentation is acquired and requirements completed in accordance with established procedures
- 2.4** Lifting, use of power tools/equipment techniques and practices are safely exercised in accordance with established procedures

- 2.5 Hazard warnings and safety signs are recognised and hazards and assessed WHS/OHS risks are reported to immediate authorised personnel for directions according to established procedures
  - 2.6 Maintenance of discrete protection and control devices is undertaken according to requirements and established procedures
  - 2.7 Data is analysed and compared with compliance specifications to ensure completion of the maintenance work is within an agreed timeframe and according to requirements
  - 2.8 Essential knowledge and associated skills are applied for the safe maintenance of discrete protection and control devices to ensure completion in an agreed timeframe and to quality standards with a minimum of waste according to requirements
  - 2.9 Unplanned events or conditions are responded to in accordance with established procedures
- 3 Complete the maintenance of discrete protection and control devices**
- 3.1 Final inspections of discrete protection and control devices are undertaken and checked against the work schedule to ensure they comply with all requirements, including all required documentation
  - 3.2 Anomalies between the work schedule requirements and measured performance are reported and solutions identified in accordance with established procedures
  - 3.3 Safe working documentation is surrendered and transformer made ready for service
  - 3.4 Worksite is rehabilitated, cleaned up and confirmed safe in accordance with established procedures
  - 3.5 Tools, equipment and any surplus resources and materials are cleaned, checked and returned to storage in accordance with established procedures
  - 3.6 Required work completion records, reports and/or documentation and information are completed, processed and appropriate personnel notified in accordance with established 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 UETTDRSB35A Maintain discrete control and protection systems.

## 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 UETTDRSB35 Maintain discrete control and protection systems

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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
- undertaking functional checks and testing of discrete control and protection devices including all of the following:
  - isolate discrete protection
  - control and indications
  - overcurrent and earth fault relays
  - direct current (d.c.) supplies
  - trip and control circuits
  - alarms and indications
  - function test of discrete devices
- inspecting discrete control and protection devices including at least three (3) of the following:
  - neutral displacement
  - no-volt changeover
  - discrete auto-reclose
  - d.c. frame leakage
  - oil surge (site maintenance)
  - voltage regulation
  - parallel operation
  - thermal overloads
  - transformer temperature control devices
  - CEL fail
- dealing with unplanned events on at least one (1) occasion.

## 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:

- principles of statutory and safety considerations encompassing:
  - Commonwealth/state/territory legislation, standards, codes, supply authority regulations and/or enterprise requirements associated with working on high voltage (HV)
  - particular reference to state and territory regulations - working near energised conductors, electrical access, heights, confined space, testing procedures and licensing rules
- principles of isolation and tagging procedures associated with protection testing encompassing:
  - standards, codes, Commonwealth/state/territory legislation, supply authority regulations and/or enterprise requirements associated with the installation, maintenance, isolation and tagging procedures
  - requirements for the use of isolation and tagging, manuals, system diagrams/plans and drawings
  - techniques in documenting isolations
  - techniques in appropriate isolation and tagging procedures in accordance with Commonwealth/state/territory legislation, supply authority regulations and enterprise standards
  - techniques in the installation and maintenance procedures protection devices in accordance with Commonwealth/state/territory legislation, supply authority regulations and enterprise standards
- maintenance procedures associated with discrete protection schemes encompassing:
  - standards, codes, Commonwealth/state/territory legislation, supply authority regulations and/or enterprise requirements associated with the maintenance procedures
  - requirements for the use of maintenance manuals, system diagrams/plans and drawings
  - techniques in maintenance procedures – planning, policy and testing techniques
  - close out requirements
- relay manufacturer specifications encompassing:
  - standards, codes, Commonwealth/state/territory and local government legislation, supply authority regulations and/or enterprise requirements applicable to the use and application of relay manufacturer specifications
  - requirements for the use of relay manufacturer manuals, system diagrams/plans and drawings
  - types, function and characteristics of specific relays - differences between specific relays used for the same functionality
- safe handling and/or disposing of insulation materials used in power distribution devices, which are potential environmental pollutants, encompassing:
  - standards, codes, Commonwealth/state/territory and local government legislation, supply authority regulations and/or enterprise requirements applicable to the handling and disposing of insulation or heat dissipation materials used in power distribution devices
  - identification of environmental issues associated with the handling and disposing of

insulation materials

- safety precautions when handling and disposing of heat dissipation materials - safe working practices; WHS/OHS hazards and precautions; identification of hazards; assessing and controlling risks; types, selection, maintenance and uses of personnel protective equipment (PPE); permit to work systems and isolation procedures; types and function of specialised equipment; safe working practices when using specialised equipment; and emergency response and rescue, including first aid
- techniques in the handling and disposing of insulation materials - polychlorinated biphenyls (PCB), asbestos, insulating Oil and sulfur hexafluoride (SF6) gas.

## 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, equipment and PPE currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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