



**Australian Government**

# **UETDRDS018 Design distribution protection systems**

**Release: 1**

# UETDRDS018 Design distribution 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 Release 4.0.

## Application

This unit includes the skills and knowledge required to design distribution protection systems in the electricity supply industry (ESI).

It includes calculations of fault levels, selection of appropriate protection devices and automation requirements, and protection coordination schemes.

It also includes recommendations to support the calculations, and compliance with workplace requirements.

The application of the skills and knowledge described in this unit may require 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 licensing requirements which must be confirmed prior to commencing this unit.

## Pre-requisite Unit

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

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits

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

UEEEL0020 Solve problems in low voltage a.c. circuits

UEEEL0021 Solve problems in magnetic and electromagnetic devices

UETDREL005 Work safely in the vicinity of live electrical apparatus

## Competency Field

Design

## Unit Sector

Not applicable.

## Elements and Performance Criteria

### ELEMENTS

### PERFORMANCE CRITERIA

Elements describe the essential outcomes.

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

#### **1 Prepare to design distribution protection systems**

- 1.1** Project requirements are determined
- 1.2** Design specifications are determined in accordance with workplace requirements
- 1.3** Tools, equipment and personal protective equipment (PPE) required for site inspections are determined, obtained and confirmed in working order
- 1.4** Requirements for site inspections are determined in accordance with workplace requirements
- 1.5** Work is prioritised and sequenced for completion in accordance with workplace requirements

#### **2 Design distribution protection systems**

- 2.1** Site inspection is performed where required
- 2.2** Distribution protection systems are designed in accordance with workplace requirements
- 2.3** Systems modelling is used to evaluate and determine best outcomes in accordance with workplace requirements
- 2.4** Design is checked for compliance against legislation, regulations, standards and codes of practice
- 2.5** Health and safety risks are identified and minimised or eliminated by using safety and control measures in the design process
- 2.6** Quality checks of work are undertaken in accordance with workplace requirements

#### **3 Complete work and documentation**

- 3.1** Completed work is checked against project and workplace requirements
- 3.2** Work records, reports and documentation are completed, approved and 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 UETDRDS006 Develop high voltage and low voltage distribution protection systems.

## 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 UETDRDS018 Design distribution protection systems

## 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:

- designing of distribution protection systems, including:
  - specifications
  - requirements for site inspection
  - systems modelling to evaluate and determine best outcomes
  - compliance against legislation, regulations, standards and codes of practice, project and workplace requirements
  - identifying, minimising or eliminating health and safety risks by using safety and control measures
  - obtaining, inspecting and using relevant personal protective equipment (PPE) for site inspection
  - prioritising and sequencing work for completion in accordance with workplace requirements
- performing at least one (1) site inspection
- performing ongoing quality checks of work in accordance with workplace requirements
- checking final design against project and workplace requirements
- completing relevant work records, reports and documentation
- completing at least two (2) protection system designs from two (2) of the following project types:
  - overhead designs
  - underground designs
  - substation designs
- completing all of the following for each design:
  - design control checklist
  - rectifying errors
  - calculations of fault levels
  - selection of appropriate protection devices
  - automation requirements
  - protection coordination schemes.

## 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:

- distribution protection systems development, including:
  - project requirements
  - development specifications
  - hazard, risk assessment and risk control requirements, including potential hazards
  - types and application of PPE
  - site inspections
  - prioritisation and sequencing of work for completion
  - use of systems modelling for best outcomes
  - compliance with legislation, regulations, standards, codes of practice, and project and workplace requirements
  - work records, reports and documentation
  - manuals, diagrams and drawings
- types of distribution equipment
- installation and maintenance procedures for distribution equipment
- electrical equipment associated with distribution field device protection and control schemes
- calculation of fault levels
- interrupting device capabilities
- types, operation, and setting of protection systems.

## 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, facilities, equipment and PPE currently used in industry for high voltage (HV) and low voltage (LV) distribution protection systems
- applicable documentation, including workplace requirements, relevant industry standards,

equipment specifications, regulations, codes of practice and operation manuals.

## **Links**

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