



**Australian Government**

# **UETDRDS003 Design power system distribution substations**

**Release: 1**

# UETDRDS003 Design power system distribution substations

## 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 2.0.

## Application

This unit covers the technical design of distribution substations to relevant standards and specifications, including earthing, location of substation relevant to load, customer and environmental needs and minor civil aspects. It also includes the necessary established procedures to ensure the substation design conforms to specific organisational technical standards, operational and system planning requirements and encompasses the principles of safe design.

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

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

UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEE125A Provide engineering solutions for problems in complex multiple path circuits

UEENEEE126A Provide solutions to basic engineering computational problems

UEENEEG101A Solve problems in electromagnetic devices and related circuits

UEENEEG102A Solve problems in low voltage a.c. circuits

UEENEEG149A Provide engineering solutions to problems in complex polyphase power circuits

UETDREL001 Apply environmental requirements

UETDREL005 Work safely in the vicinity of live electrical apparatus

UETDRIS005 Implement & monitor power system environmental & sustainable energy management policies & procedures

UETDRIS006 Implement and monitor the power system organisational WHS/OHS policies, procedures and programs

Pathway Unit Group 1

UETDRDS013 Organise and implement ESI line and easement surveys

UETDRDS014 Prepare and manage detailed construction plans for electrical power system infrastructure

Pathway Unit Group 2

UETDRDS006 Develop high voltage and low voltage distribution protection systems

## Competency Field

Design

## Unit Sector

Not applicable.

## Elements and Performance Criteria

### ELEMENTS

Elements describe the essential outcomes.

#### **1 Plan for and coordinate the safe design of distribution substations**

### 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) practices/procedures and environmental and sustainable energy procedures, which may influence the design of distribution substations, are reviewed and determined
- 1.2** Purpose of the design is established and expected outcomes of the work are confirmed with appropriate personnel
- 1.3** Organisational established procedures on policies and specifications for the design are obtained or established with appropriate personnel
- 1.4** Equipment/tools and personal protective equipment (PPE) are selected and coordinated based on specified requirements and established procedures

- 1.5 Work is prioritised and sequenced for the most efficient and effective outcome following consultation with others for completion within acceptable timeframes, to a quality standard and in accordance with established procedures
  - 1.6 Risk control measures are identified, prioritised and evaluated against the work schedule
  - 1.7 Relevant work permits are secured to coordinate the performance of work according to requirements and/or established procedures
  - 1.8 Resources, including personnel, equipment, tools and PPE required for the job are identified, scheduled and coordinated and confirmed safe and in technical working order
  - 1.9 Liaison and communication issues with other/authorised personnel, authorities, clients and landowners are resolved and activities coordinated to carry out work
  - 1.10 Site is prepared according to the work schedule and to minimise risk and damage to property, commerce and individuals in accordance with established procedures
- 2 **Carry out and coordinate the design of distribution substations**
  - 2.1 Circuit/systems modelling is used to evaluate alternative proposals in accordance with established procedures
  - 2.2 WHS/OHS and sustainable energy principles, functionality and practices to reduce the incidence of accidents and minimise waste are incorporated into the project in accordance with requirements and/or established procedures
  - 2.3 System design decisions are made on the basis of safety and effective outcomes according to requirements and/or established procedures
  - 2.4 Mathematical models of the distribution system are used to analyse the effectiveness of the finished project in accordance with requirements and established procedures
  - 2.5 Technical advice is given to potential hazards, safety risks and control measures so that monitoring and preventative action can be undertaken and/or appropriate authorities consulted, where necessary, in accordance

- with requirements and established procedures
- 2.6 Essential knowledge and associated skills are applied to analyse specific data and compare it with compliance specifications to ensure completion of the project within an agreed timeframe according to requirements
  - 2.7 Solutions to non-routine problems are identified and actioned using acquired essential knowledge and associated skills according to requirements
  - 2.8 Quality of work is monitored against personal performance agreement and/or established organisational and professional standards
- 3 Complete and coordinate the design of distribution substations**
- 3.1 Final inspections of the design are undertaken to ensure they comply with all requirements and include all specifications and documentation needed to complete the design brief
  - 3.2 Appropriate personnel are notified of completion and reports and/or completion documents are finalised
  - 3.3 Reports and/or completion documents are submitted to relevant personnel/organisations for approval and, where applicable, statutory or regulatory approval
  - 3.4 Approved copies of design documents are issued and records are updated 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 UET Transmission, Distribution and Rail Sector Training Package Companion Volume Implementation Guide.

## Unit Mapping Information

This unit replaces and is equivalent to UETDRDS37 Design power system distribution

substations.

## Links

Companion Volume Implementation Guides are found in VETNet -

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