



Australian Government

UETDRDS022 Design underground distribution systems

Release: 1

UETDRDS022 Design underground distribution 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 underground distribution systems in the electricity supply industry (ESI).

It includes distribution layout principles and infrastructure, including underground asset types, materials, and equipment and tools.

It also includes material lists, cable specifications, buried services, and other infrastructure.

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

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 underground distribution 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 underground distribution systems

- 2.1** Site inspection is performed
- 2.2** Underground distribution system is 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** Sustainable energy principles are used to evaluate and determine best outcomes in accordance with workplace requirements
- 2.5** Design is checked for compliance against legislation, regulations, standards and codes of practice
- 2.6** Health and safety risks are identified and minimised or eliminated by using safety and control measures in the design process
- 2.7** Quality checks of work are undertaken in accordance with workplace requirements

3 Complete work and documentation

- 3.1** Completed work is checked against customer 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 UETDRDS005 Design underground distribution power 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 UETDRDS022 Design underground distribution 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 (2) separate occasions and include:

- designing underground distribution systems, including:
 - specifications
 - requirements for site inspection
 - systems modelling to evaluate and determine best outcomes
 - sustainable energy principles and practices
 - 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
 - environmental sustainability principles
 - 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 six (6) underground distribution or sub-transmission system designs for at least three (3) of the following:
 - residential subdivision developments
 - industrial/commercial subdivision developments
 - upgrade/alteration to existing assets
 - underground supplies to customers
- completing for each of the designs:
 - a design control checklist
 - rectifying errors.

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:

- underground distribution systems design, including:
 - project requirements
 - design 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 to evaluate and determine best outcomes
 - application of sustainable energy principles and practices
 - compliance with legislation, regulations, standards, codes of practice, and project and workplace requirements
 - work records, reports and documentation
- distribution infrastructure, including:
 - manuals, diagrams and drawings
 - residential subdivision developments
 - industrial/commercial subdivision developments
 - upgrade/alteration to existing assets
 - underground supplies to customers
 - material lists, cable size, type and route length
- control procedures and documents, including:
 - design control checklists
 - common design errors
 - rectification of errors
- layout principles for underground distribution, including determination of:
 - cable size, type and route length
 - materials, equipment and tools
 - component types, quantities and costing
 - component and equipment spacing
- installation considerations for underground cable including:
 - workplace requirements
 - excavation and trench safety regulations
 - gas detection procedures
 - working in confined spaces
 - PPE requirements
 - liquified gas equipment hazards
 - testing procedures for liquified gas equipment

- buried services and other infrastructure, including:
 - telecommunications
 - power
 - water
 - sewerage
 - gas
- trench excavation and reinstatement procedures
- calculation of voltage drop in relation to length of cable run
- techniques for reducing electrical stress on cables
- cable derating factors
- methods for joining and terminating cables
- techniques for the installation of cables above and below ground
- techniques for cable testing and the location of cable faults
- techniques for cable drawing.

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
- applicable documentation, including workplace requirements, relevant industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

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