



Australian Government

Assessment Requirements for UETDRDS017 Design customer substations

Release: 1

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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.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least two (2) separate occasions and include:

- determining project requirements
- determining design specifications
- obtaining, inspecting and using relevant personal protective equipment (PPE) for site inspection
- determining requirements for site inspections in accordance with workplace requirements
- prioritising and sequencing work for completion in accordance with workplace requirements
- performing at least one (1) site inspection
- demonstrating use of systems modelling to evaluate and determine best outcomes
- applying sustainable energy principles and practices
- checking design for compliance against legislation, regulations, standards and codes of practice
- identifying, and minimising or eliminating health and safety risks by using safety and control measures
- 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) designs from at least two (2) of the following project types:
 - single transformer substation
 - multi-transformer substation
 - upgrade/alteration to existing asset
 - auto-changeover system
- drafting each of the following for each of six (6) substation designs:
 - single line diagram
 - above ground layout diagram
 - earthing layout diagram
 - primary plant dimensioning checklist
 - standards compliance checklist

- hazard identification, risk assessment and control measures.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria and include knowledge of:

- customer substation design, including:
 - project requirements
 - design specifications
 - hazard, risk assessment and risk control requirements, including potential hazards
 - types and application of PPE
 - site inspections
 - 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
 - manuals, diagrams and drawings
- types, functionality and maintenance of specialist tools, including:
 - laser scans
 - geotech studies
 - survey equipment
 - ground penetrating radar
- buried services and other infrastructure, including:
 - telecommunications
 - power
 - water
 - sewerage
 - gas
- relationship between primary and secondary systems
- types of substations or upgrades, including:
 - single transformer substations
 - multi-transformer substations
 - upgrade/alteration to existing assets
 - auto-changeover systems
- transformers, including:
 - types
 - characteristics
 - basic construction
 - operation under load/no-load conditions
 - types and operation of tap changing switches

- efficiency and cooling
- auxiliary equipment
- maintenance
- restrictions to parallel operation
- harmonics issues and remedies
- testing and fault-finding procedures
- fire and oil management, including:
 - bund design
 - flame traps
 - oil/water separation systems.
- high voltage (HV) switchgear, including:
 - protection and alarms
 - operating limitations
 - protection device rating
 - switching equipment and practices
 - paralleling requirements
 - isolation and earthing procedures
 - common distribution faults
- metering and control equipment including:
 - types of meters
 - installation and removal
 - associated equipment and accessories
 - testing procedures
- automation systems, including:
 - function
 - main components
 - operation procedure
- layout principles for a distribution substation including:
 - relationship to overall power system
 - purpose
 - location
 - equipment layout
- principles of computer-aided drafting.

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 tools, equipment and PPE currently used in industry to design customer substations
- applicable documentation, including workplace requirements, relevant industry standards, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume Implementation Guides are found in VETNet -

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