



Australian Government

Assessment Requirements for UETTD RIS69 Diagnose and rectify faults in energy supply apparatus

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.

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
- diagnosing and rectifying faults in energy supply apparatus, including:
 - applying logical diagnostic methods
 - using fault scenarios to test the cause of system faults
 - identifying faults and competency needed to rectify them
 - rectifying faults in system controls
 - verifying that the system operates correctly
 - documenting fault rectification
 - dealing with unplanned events on at least one occasion.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases, the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

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:

- control of voltage encompassing:
 - conditions leading to voltage collapse and system disintegration
 - effects on the system of high voltage (HV)/low voltage (LV)
 - voltage control devices - voltage regulators applied to generators and synchronous phase modifiers; electromagnetic voltage regulators; series and parallel capacitors; on-load tap changers (OLTC) transformers and static VAR compensations (SVCs), such as saturated reactor (SR) compensations, thyristor controlled reactor (TCR) compensators, combined

TCR/TSCs and the production of wave-form distorting harmonics and control devices

- the importance of the location in the system of voltage control devices
- the use of graphical methods to calculate the size of VAR regulating plant
- control of power encompassing:
 - base load and spinning reserve
 - regulating machines
 - rapid start plant
 - phase shifting transformers and various forms of load shedding
 - principles and practices of automated control of individual machines
 - stations and transmission/tie-line elements
 - synchronising power
- the relationship between power and frequency encompassing:
 - limiting values
 - machine stabilising - steam by-pass, rapid valving, slip stabilisers and over speed limiting
 - use of single pole generator CB's
 - use of machine AVR's as angular stabilisers
 - damped and un-damped system oscillations
 - relationship between fault clearance times and system stability
 - calculation of critical clearance angles based on equal area criteria
- types of communication systems encompassing:
 - telephone, power line carrier, dedicated cable, microwave links and fibre optics
 - quantities and signals to be communicated
 - advantages and disadvantages of the various systems
 - equipment requirements
- transient over-voltages in power systems encompassing:
 - switching and lightning over-voltages and their effect on different plant items
 - transient over-voltage control and reduction using surge diverters, shield wires and CB control
 - insulation systems, insulation coordination, insulation grading in plant items, bushings and capacitor bushings
- factors leading to the generation of corona encompassing:
 - consequences of corona
 - reduction of corona
 - conductor bundling, grading rings and conductor surface treatment
- power system protection encompassing:
 - location of CT's in major plant items
 - earthing principles and devices
 - fault current control/limitation using neutral earthing compensators (NEC's), neutral point earth impedances, high conductivity shield wires and parallel feed interlocking
 - application of different types of protection.

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, facilities, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, relevant industry standards, equipment specifications, regulations, codes of practice and operation manuals.

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>