



Australian Government

Assessment Requirements for UETTDRTS28 Repair, test and calibrate protection relays and meters

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
- using all of the following simple protection schemes:
 - auxiliary
 - overcurrent
 - timers
 - voltage
- using at least three (3) of the following intermediate protection devices:
 - inverse time delay overcurrent
 - voltage regulating relays
 - differential
 - pilot wire
- using at least two (2) of the following advanced protection schemes:
 - multi-zone impedance
 - multi-function feeder protection
 - phase comparison
 - digital current differential
- dealing with unplanned events on at least one (1) occasion.

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:

- procedures for the location and rectification of faults in electrical equipment up to 1000 volts alternating current (a.c.) and/or 1500 volts direct current (d.c.) encompassing:
 - relationship of WHS/OHS to the location and rectification of faults in electrical

- equipment - acts and regulations, identification of personal safety, workplace hazards, working with electrically operated tools and equipment, emergency first aid/resuscitation, rescue from a live electrical situation, and enterprise policies and procedures
- types of drawings - differentiation between symptoms, faults and causes in malfunctioning equipment, fault-finding techniques and procedures
- fundamental electrical concepts - effects of current, practical resistors, sources of electromagnetic field, series, parallel and series-parallel circuits, electrical measurement, capacitors, inductors and magnetism
- fundamentals of general appliances - basic principles of appliances (non-mathematical), appliance identification, appliance ratings, basic principles of operation of control equipment and protection devices, fault conditions and symptoms, safe isolation procedures, test equipment, safe testing procedures, including continuity, fault types in appliances and fault-finding procedures (prescriptive)
- fundamentals of single phase induction motors - basic principles of operation (non-mathematical), motor identification, motor ratings, basic principles of operation of control equipment and protection devices, fault conditions and symptoms, safe isolation procedures, test equipment, safe testing procedures, including continuity, fault types in phase splitting and universal type motors and fault-finding procedures (prescriptive)
- fundamentals of three phase induction motors - basic principles of operation (non-mathematical), motor identification, motor ratings, motor starter principles, basic principles of operation of control equipment and protection devices, fault conditions and symptoms, safe isolation procedures, safe testing procedures and fault-finding procedures (prescriptive)
- fundamentals of single and three phase electrical heaters - basic principles of operation, types of electrical heaters, electrical heater identification, electrical heater ratings, basic principles of operation of control and protection devices, fault conditions and symptoms, safe testing procedures and fault-finding procedures (prescriptive)
- detailed operation of metering devices and principles encompassing:
 - common circuit configurations
 - meters and measurement principles
 - instrument transformer application
 - testing of metering systems and devices
 - implications of market operation
- detailed operation of fundamental test equipment encompassing:
 - care and safe use
 - operating principles
 - comparison of different operating principle meters used for the same purpose
 - accuracy and loading effects of meters - measurement of voltage, current, power, resistance, insulation resistance, impedance and phase sequence, and the use of oscilloscopes
- detailed operation of protection test equipment encompassing:
 - care and safe use
 - operating principles

- comparison of different operating principle meters used for the same purpose
- accuracy and loading effects of meters - measurement of timing, voltage, current, resistance, inductance, capacitance, impedance, frequency, phase angle, phase difference, and the use of primary, secondary and gas injection equipment
- protection schemes encompassing:
 - standards, codes, legislation, supply authority regulations and/or enterprise requirements applicable to protection schemes
 - types of protection schemes - reasons for use, application of protection zones around system elements and degree of protection
 - types of feeder protection equipment - overcurrent protection inverse time-current operating characteristics
 - operation of overcurrent protection equipment used on distribution systems
 - operation of automatic circuit reclosers (ACR) and their time-current characteristics
 - types and characteristics of over-current relays
 - coordination methods of a distribution feeder protection scheme
 - earth fault protection used on a distribution feeder
 - operation of a single wire earth return (SWER) system.

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>