Australian Government

Assessment Requirements for UETTDRDS49 Establish and manage power system geographical information systems data

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
- completing geographical information systems (GIS) records relating to six (6) distribution or sub-transmission network relating to the following project types:
  - overhead extensions (distribution or sub-transmission)
  - underground extensions (distribution or sub-transmission)
  - substation construction (distribution or sub-transmission)
- completing projects including:
  - any preparation and updating of detailed construction drawings of distribution and sub transmission networks
  - the use of a GIS
- 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:

- drawings, diagrams and schedules used in electrotechnology work encompassing:
  - drawing types and applications: drawing layouts and conventions - mechanical drawings, electrical/electronic schematics, wiring diagrams, PC boards, location diagrams (architectural drawings), cable routes and switching arrangements, and building details
  - drawing symbols - symbols representing electrotechnology circuit components, equipment location, and cable routes and control arrangements
  - cable/wiring/connection and equipment/component/schedules
- working safely on or around electrical equipment through the application of risk management principles and control measures for dealing with non-electrical hazards and extra-low voltage (ELV), low voltage (LV) and high voltage (HV) hazards and high current hazards

encompassing:

- risk management and assessment of risk - principle and purpose of risk management and processes for conducting a risk assessment
- hazards associated with LV, ELV and high currents - arrangement of power distribution and circuits in an electrical installation, parts of an electrical system and equipment that operate at LV and ELV and parts of an electrical system and equipment where high currents are likely
- risks and control measures associated with HV - parts of an electrical system and equipment that operate at HV; the terms 'touch voltage', 'step voltage', 'induced voltage' and 'creepage' as they relate to the hazards of HV; and control measures used for dealing with the hazards of HV
- optical fibre safety - coherent optical sources and joining procedures and laser safety class 3a devices or their replacement
- risks and control measures associated with LV - risks associated with modifying electrical installations; fault finding, maintenance and repair; control measures before, during and after working on electrical installations; circuits or equipment; isolation and tagging-off procedures; risks and restrictions in live work and control measures for live work
- risks and control measures associated with harmful dusts and airborne contaminants: - thermal insulation, fibrous cement materials and asbestos, and other fibre reinforced switchboard materials
- safety, selection, use, maintenance and care of test equipment - safety characteristics of electrical testing devices, safe use of electrical testing device, and checks and storage methods for maintaining the safety of testing devices

- WHS/OHS enterprise responsibilities encompassing:
  - provisions of relevant WHS/OHS legislation
  - principles and practice of effective WHS/OHS management
  - management arrangements relating to regulatory compliance
  - enterprise hazards and risks, control measures and relevant expertise required
  - characteristics and composition of workforce and their impact on WHS/OHS management
  - relevance of enterprise management systems to WHS/OHS management
  - analysis of working environment and design of appropriate WHS/OHS management systems
  - analysis of relevant data and evaluation of WHS/OHS system effectiveness
  - assess resources to establish and maintain WHS/OHS management systems
- installation of overhead distribution conductors encompassing:
  - standards, codes, legislation, supply authority regulations and/or enterprise requirements applicable to installing conductors and associated equipment
  - requirements for the use of overhead line construction manuals, system diagrams/plans and drawings - material lists, conductor size, type and route length
  - constructions types and structures for distribution and sub-transmission lines
  - types, sizes and characteristics of overhead conductors
  - resources for the stringing and maintenance of conductors - types of LV and HV overhead

electrical conductor connections; causes and effects of poor electrical connections; reasons for and methods used to maintain standard phase sequencing; removing, repairing and replacing damaged conductors; minimum clearances between overhead conductors and LV and HV structures
    - techniques for conductor installation - types and application of tools, equipment and hardware; and methods of stringing, tensioning and termination of LV and HV conductors
- electrical equipment fundamentals used in the powerline industry encompassing:
    - legislation, standards, codes, legislation, supply authority regulations, and specific enterprise regulations pertaining to the use and care of electrical equipment
    - electrical equipment will vary according to the enterprise but encompass both HV and LV equipment
    - characteristics, capabilities and application of powerline electrical equipment
    - safety precautions with regards to using electrical equipment
    - techniques in pre-use inspection on the serviceability of electrical equipment
    - techniques in the general maintenance, care and storage of electrical equipment
    - identifying hazards, assessing and controlling risks associated with the use of electrical equipment
- principles of safe design encompassing:
    - Commonwealth/state/territory legislation, standards, codes, supply authority regulations and/or enterprise requirements associated with safe design principles
    - particular reference to state and territory regulations regarding working near energised conductors, electrical access, heights, confined space, testing procedures and licensing rules
    - application of safe design principles - safe design duty related information, safe design process related information and safe design evaluations
- enterprise-specific switching diagrams and drawing encompassing:
    - types and application of enterprise-specific switching drawings and documents - wiring and schematic diagrams and switching symbols, mechanical drawings dealing with switching operations, project charts, switching schedules, graphs, technical manuals and catalogues, and instructions/worksheets
    - interpretation of different system switching diagrams - LV system switching diagrams, direct current (d.c.) traction supply sectioning diagrams, HV transmission and distribution system symbols and feeder plans, and processes of updating switching diagrams
- enterprise-specific data management processes encompassing:
    - standards, codes, legislation, supply authority regulations and/or enterprise requirements applicable to data management
    - requirements for the use of manuals, substation diagrams/plans and drawings
    - types of enterprise-specific computer software
    - techniques in storing and retrieving data and reports from the computer
    - techniques in using the data management systems in following necessary commands and protocols in accordance with the enterprise-specific procedures
    - calculation of results and data measurements using the computer
    - techniques in the preparation of preliminary works creation and closure

- procedures for the location and rectification of faults in electrical equipment up to 1000 volts alternating current (a.c.) and or 1500 volts d.c. encompassing:
  - relationship of WHS/OHS to the location and rectification of faults in electrical equipment - Acts and regulations, identification of personal safety and 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 and fault-finding techniques and procedures
  - fundamental electrical concepts - effects of current, practical resistors, sources of electromagnetic field (EMF); 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 procedure and fault-finding procedures (prescriptive)
- GIS principles encompassing:
  - standards, codes, supply authority regulations and/or enterprise requirements associated with the use of geographic information systems
  - requirements for the use of system manuals, system diagrams/plans and drawings
  - techniques in system use - system structure, preparation of data, methods of data entry, methods of accessing data, linking to other databases and output options.

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 to undertake establishment and management of GIS data
- 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