Australian Government

Assessment Requirements for UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories

Release: 2

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Modification History

Release 2. This is the second release of this unit of competency in the UEE Electrotechnology Training Package.

Workplace evidence requirements updated in Performance Evidence and Assessment Conditions.

Assessor requirements updated in Assessment Conditions.

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology 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, performance criteria and range of conditions on at least two separate occasions and include:

- # reading and interpreting drawings and schedules related to cable layouts, apparatus locations and circuit connections
- # planning cable routes and installation of appliances, switchgear and accessories and obtaining installation materials
- # identifying underground services
- selecting underground consumers mains in accordance with AS/NZS 3000 and local supply authority requirements
- sequencing the installation effectively with other relevant people
- installing and terminating consumer mains for connection via overhead terminals and underground
- # installing of conduit, cable ladder/tray
- # installing wiring systems for low voltage (LV) circuits
- routing, placing and securing cables in accordance with industry standards
- # installing LV electrical apparatus and associated equipment
- selecting equipment suitable for installation in given damp situations
- # placing and securing appliances, switchgear and accessories accurately in their planned location
- terminating cables and conductors, including aerial types in accordance with industry standards
- # terminating subcircuit cabling at switchboards and connecting components including:
  - correct interconnection between switchgear, protection devices and links'
  - use of adequately sized cables
  - correct marking of equipment

  - clear identification of circuit neutral conductors
- # terminating and connecting appliances, switchgear and accessories in accordance with industry standards
- # conducting safety inspection, testing and documentation of installed circuits, including verification of earth continuity, insulation resistance, polarity, circuit connections and protection arrangements
- # maintaining fire integrity.

Knowledge Evidence

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

- standards, codes and requirements applicable to the installation of wiring systems and electrical equipment, including:
  - cables and methods of mechanical protection and support
  - techniques for protection against and from other services
  - identifying prohibited cable locations
  - identifying systems with alternate supplies
  - building codes affecting the installation of cables and current-using carrying equipment and accessories in buildings, structures and premises, including limitation on penetration of structural elements, maintenance of fire protection integrity, requirements for emergency/safety services and wiring above suspected ceilings
  - issues affecting electrical installations in heritage buildings and premises (limitation on penetration of structural and finished elements, accessing cable routes, types and colour of exposed accessories)
  - techniques for protection against thermal effects
  - required and permitted locations of current-using equipment and accessories
  - control, switching, overcurrent and residual current device (RCD) protection
  - equipotential bonding in accordance with AS/NZS 3000 and local supply authority requirements
  - sizing of wiring enclosures based on space factor recommendations of AS/NZS 3000 Wiring Rules
- techniques for installing cables and wiring systems, including:
  - typical cable routes through buildings, structures and premises
  - application of wiring accessories
  - drawing-in, placing and fixing of cables
  - cable and conductor terminations
  - methods of maintaining fire rating integrity
  - techniques for inspecting and testing installed and terminated cables to ensure they comply with continuity and insulation resistance and are safe to connect to the supply
  - connection of electrical equipment and terminal configuration for connection of phase,

neutral and protective earthing conductors for the following types of equipment:
  - heating
  - lighting and smoke detectors
  - motors
  - transformers
  - switchgear and accessories pendant socket outlets
  - appliances.
- termination of subcircuit cabling at switchboards and connection to components including:
  - correct interconnection between switchgear, protection devices and links'
  - correct preparation for fitting and connection of local supply authority equipment
  - use of adequately sized cables
  - correct marking of equipment
  - clear identification of circuit neutral conductors
  - correct polarity
  - safe removal of equipment and termination of unused cable
- varied and additional standards and requirements for special situations, including:
  - patient treatment areas
  - marinas and boats at LV
  - transportable structures and vehicles and their site supplies
  - shows and carnivals
  - systems with alternate supplies
- methods for the installation, modification and testing of electrical installations and equipment for construction and demolition sites, complying with AS/NZS 3012 and applicable workplace safety legislation including:
  - supply requirements
  - switchboards for the purpose of construction and demolition
  - protection of circuits
  - construction wiring
  - lighting
  - socket outlets
  - circuits for lifts
  - calibration of instruments
  - inspection and testing methods
  - initial and periodic inspection and testing
- identifying hazardous areas, including:
  - additional training required to work competently with electrical equipment for hazardous areas
  - nature of areas classified as a hazardous area
  - responsibility for classifying a hazardous area
  - awareness of standards called up by the Wiring Rules for selection, installation,

inspection and maintenance of electrical equipment and installations in hazardous areas AS/NZS 3000 requirements for hazardous areas

- requirements for the installation of cables and accessories in damp situations and extra-low voltage (ELV) installations, including:
  - restricted zones around baths, showers, fixed water containers, pools, sauna heaters and fountains/water features for given installations
  - techniques for selecting equipment suitable for installation in given damp situations
  - voltage range that defines ELV
  - use of RCDs for damp situations
  - separated extra-low voltage (SELV) system and a protected extra-low voltage (PELV) system
  - AS/NZS 3000 Electrical installations (known as the Australian/New Zealand Wiring Rules) requirements for selecting ELV systems and devices for a range of installations and conditions
  - equipotential bonding in showers, bathrooms, swimming and spa pools
- installation of aerial conductors and underground wiring including:
  - AS/NZS 3000 requirements
  - types and application of aerial conductors
  - aerial span limitations and required clearances
  - selection of aerial supporting poles/post and struts for a given application
  - use and requirements of catenary support systems
  - acceptable cable types and protection for underground wiring categories
  - underground wiring depth and protection
  - underground wiring clearances from other services
  - techniques for termination of aerial cables
  - techniques for testing of installed cables in compliance with Australian Standards
  - install unprotected consumer's mains to reduce the risk of short-circuit to a minimum
- hazards and safety requirements related to equipment incorporating electronic components used in electrical systems.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessors must also hold the occupational licence for the jurisdiction the assessment is occurring where the activity being assessed requires a licence to practice.

Assessment must occur in suitable workplace operational situations where it is appropriate to do so, where this is not appropriate, assessment must occur in suitable simulated workplace operational situations that replicate 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, equipment specifications, regulations, relevant industry standards, codes of practice and operation manuals.

In addition, evidence of Performance Evidence items of this unit marked with a hash (#) must be gathered in authentic workplace operational conditions (not simulated) before final determination of competence in this unit can be made.

Links

Companion Volume Implementation Guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6