Australian Government

UEEEL0039 Design, install and verify compliance and functionality of general electrical installations

Release: 2

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Modification History

Release 2. Updated superseded imported Pre-Requite units.

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to design, install, inspect and test to verify an electrical installation is safe and complies with regulatory requirements.

It includes working safely; designing, installing, commissioning and fault finding of electrical installations; visual inspections and mandatory testing; following workplace procedures; and completing mandatory reporting requirements.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, a relevant contract of training, such as an Australian Apprenticeship, may be required.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Those holding an 'Unrestricted Electrician's Licence' or equivalent issued in an Australian state or territory meet the requirements of this unit and its prerequisite requirements.

A 'licensed electrician' who requires this unit to demonstrate currency for regulatory purposes may be required to undertake this unit to demonstrate their currency with verification of compliance requirements. In this case they are deemed to have met the prerequisites for this unit provided that they hold a current 'electricians licence' or its equivalent issued in an Australian state or territory; and, have recently been in employment as a licensed electrician sufficient to evidence current knowledge of applicable standards and regulations.

Pre-requisite Unit

HLTAID009 Provide cardiopulmonary resuscitation

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

UEECD0016 Document and apply measures to control WHS risks associated with electrotechnology work

UEECD0019 Fabricate, dismantle and assemble utilities industry components

UEECD0020 Fix and secure electrotechnology equipment

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications

UEEEL0003 Arrange circuits, control and protection for general electrical installations

UEEEL0005 Develop and connect electrical control circuits

UEEEL0008 Evaluate and modify low voltage heating equipment and controls

UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment, and controls

UEEEL0010 Evaluate and modify low voltage socket outlets circuits

UEEEL0012 Install low voltage wiring, appliances, switchgear and associated accessories

UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits

UEEEL0018 Select wiring systems and cables for low voltage general electrical installations

UEEEL0019 Solve problems in direct current (d.c.) machines

UEEEL0020 Solve problems in low voltage a.c. circuit

UEEEL0021 Solve problems in electromagnetic devices

UEEEL0023 Terminate cables, cords and accessories for low voltage circuits

UEEEL0024 Solve problems in alternating current (a.c.) rotating machines

UEEEL0025 Test and connect transformers

UEEEL0047 Identify, shut down and restart systems with alternate supplies

UETDRRF004 Perform rescue from a live LV panel

and

UEECD0043 Solve problems in direct current circuits

or

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits

Competency Field

Electrical

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Prepare to design, install, inspect and test an electrical installation	**1.1** WHS/OHS control measures for the site are identified and applied
	1.2 WHS/OHS risk control measures and workplace procedures are followed in preparation for work
	1.3 Safety hazards, which have not previously been identified, are noted and risk control measures are implemented
	1.4 Installation documentation and/or relevant industry standard are reviewed and applied
	1.5 Appropriate person/s is consulted to ensure work is coordinated with others involved on the worksite
	1.6 Need to test or measure live electrical work is determined in accordance with WHS/OHS requirements and conducted in accordance with workplace safety procedures
	1.7 Circuits, machines and/or plant are isolated in accordance with WHS/OHS job requirements and workplace procedures
	1.8 Installation of wiring, appliances, switchgear, control gear and associated accessories is planned and appropriately sequenced in consultation with relevant person/s
	1.9 Locations of appliances, switchgear, accessories and cable routes are planned within the constraints of building structure, other services, specifications and regulatory requirements
	1.10 Tools, equipment and testing devices needed to verify compliance are obtained in accordance with workplace procedures and checked for correct operation and safety
	1.11 Preparatory work is checked to ensure it complies with planned specifications and no damage has occurred

2 Select wiring systems, cables, control and protection for general electrical installations	**2.1**	Wiring system is selected and suitable for the environments in which it will operate
	2.2	Cable conductor sizes are selected to meet current-carrying capacity requirements and voltage-drop and earth fault-loop impedance limitations in accordance with relevant industry standards
	2.3	Protective devices are selected to meet the required switching and tripping currents coordination and discrimination for overload and short circuit protection in accordance with relevant industry technical standards
	2.4	Earthing system components are selected to meet multiple earthed neutral (MEN) system in accordance with relevant industry standards
	2.5	Residual current devices (RCDs) are selected to meet the required circuit switching and tripping currents in accordance with relevant industry technical standards
	2.6	Switchgear/control gear is selected to meet current and voltage requirements and confirmed suitable for environmental conditions (ingress protection (IP) ratings) and functional requirements
	2.7	Switchboards are arranged to accommodate control and protective devices, links, safety services and other distributor equipment in accordance with relevant industry technical standards
3 Install low voltage (LV) wiring and associated accessories	**3.1**	Wiring and accessories are installed and terminated to comply with technical standards and job specifications and requirements
	3.2	Cables and conductors are terminated at accessories in accordance with manufacturer specifications and regulatory requirements
	3.3	Ongoing compliance and safety inspection of installed wiring systems and testing of installed circuits is undertaken
	3.4	Defects revealed through ongoing compliance and safety inspection and tests are rectified
4 Install and connect LV	**4.1**	Appliances, switchgear and accessories are installed to

appliances, switchgear and associated accessories		comply with technical standards and job specifications and requirements with sufficient access to affect terminations, adjustment and maintenance
	4.2	Wiring is terminated at appliances, switchgear and accessories in accordance with manufacturer specifications and functional and regulatory requirements
	4.3	Ongoing compliance and safety inspections of the installed appliances, switchgear and accessories are undertaken
	4.4	Defects revealed through ongoing compliance and safety inspection are rectified
5 Visually inspect and conduct safety testing on electrical installation	**5.1**	Wiring is checked for suitability within the environments in which it is installed to ensure it is suitably protected from damage or overheating in accordance with relevant industry standards
	5.2	Cable conductor sizes are compliant with current-carrying capacity, voltage-drop and fault-loop impedance limitations in accordance with relevant industry standards
	5.3	Protection methods and devices are verified as meeting coordination requirements for overload and short-circuit protection in accordance with relevant industry standards
	5.4	Switchgear and control gear rating is verified as being appropriate and meets functional requirements in accordance with relevant industry standards
	5.5	Electrical equipment inspection and testing evidence is cited and verified in accordance with WHS/OHS safety regulations
	5.6	Earthing system and components are located correctly, and conductor selection sizes are verified
	5.7	Markings on switchboards are checked for accuracy and clarity and comply with requirements
	5.8	Mandatory tests are conducted in accordance with relevant industry standards
	5.9	Testing is conducted to verify fault-loop impedance is sufficiently low and RCDs operate in accordance with

		relevant industry standards
6 Report inspection and test findings	**6.1**	WHS/OHS risk control work completion measures and procedures are followed
	6.2	Worksite is cleaned and made safe in accordance with workplace procedures
	6.3	Non-compliance defects are identified and reported in accordance with workplace procedures
	6.4	Recommendations for rectifying defects are made in accordance with workplace procedures
	6.5	Mandatory documentation is completed in accordance with workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Designing, installing and verifying compliance and functionality of at least two general electrical installations must include:

- a main switchboard supplying more than one circuit each for:
  - lighting
  - socket outlets
  - fixed appliances
- one installation must include a circuit supplying a three phase load
- one installation must include a safety service or alternate supply
- one installation must include a distribution board separate from the main switchboard

Unit Mapping Information

This unit replaces and is not equivalent to UEENEEG105A Verify compliance and functionality of low voltage general electrical installations.

Links

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