



Australian Government

MEM13017 Apply safety practices, procedures and compliance standards associated with licensed electrical work

Release: 3

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Modification History

Release 3. Prerequisite units update

Release 2. Minor adjustments to reflect ERAC requirements for electrician licensing and revision of Essential Performance Capabilities

Release 1. New unit

Application

This unit of competency has been developed for Engineering Tradesperson – industrial electrician apprenticeship training and the recognition of trade-level skills in working safely with electrical installations and equipment; following work health and safety (WHS) systems and procedures; and the scope, application and fundamental principles of AS/NZS 3000:2007 Electrical installations (known as the Australian/New Zealand Wiring Rules).

It covers knowledge of the application of WHS regulations; procedures for identifying and mitigating electrical hazards; supervision requirements applying to apprentices and trainees; following documented safe work methods, including safe isolation procedures: and application of compliance standards to ensure electrical installations and equipment are safe to use.

This unit covers the skills and knowledge required to meet the Electrical Regulatory Authorities Council (ERAC).

Essential Performance Capabilities (EPCs):

- EPC 45 – Demonstrate the knowledge and practices that are essential for working safely with electrical equipment and tools, for safe manual handling, working safely at heights and in confined spaces. Knowledge of testing and tagging procedures to AS 3760.
- EPC 55 – Demonstrate knowledge and application of electricity generation systems and electricity converters and the requirements of AS/NZS 3000 Wiring Rules for stand-alone and grid connected systems. Basic knowledge of battery storage systems and uninterruptible power supplies.

And

Essential Performance Capability (EPC) classified as 'critical':

- EPC 10 – Demonstrate an understanding of the fundamental safety principles of AS/NZS 3000 Part 1. Knowledge of hierarchy of standards. Normative/informative text.
- EPC 31 – Demonstrate the knowledge and skill to perform effective isolation of any equipment, including switch and lock off, circuit isolation, equipment testing and tag out procedures, including capacitor banks.
- EPC 43 – Demonstrate understanding of the requirements for personal safety in the workplace and application of safety practices.

Some jurisdictions require the holder of this unit to be licensed or certified and users should check with the relevant authorities.

Band: A

Unit Weight: 2

Pre-requisite Unit

MEM13015 Work safely and effectively in manufacturing and engineering

Competency Field

Work health and safety

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Follow WHS systems and procedures	1.1 Follow standard operating procedures (SOPs)
	1.2 Comply with WHS requirements at all times, including appropriate risk control measures
	1.3 Use appropriate personal protective equipment (PPE) in accordance with SOPs
	1.4 Identify job requirements from specifications, drawings, job sheets or work instructions
	1.5 Isolate and tag circuits and equipment in accordance with procedures, where required
	1.6 Ensure all tools and equipment are checked for safety in accordance with procedures and regulatory requirements
	1.7 Follow established safety rules before beginning work on electrical wiring and equipment
	1.8 Determine and implement the level of supervision required appropriate to the type of electrical work and the level of the apprentice's and/or trainee's training
	1.9 Follow safe work procedures when working at heights

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.
and in confined spaces

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| 2. Perform emergency first aid | 2.1 Assess situation to identify points of danger to the injured person and potential rescuer |
| | 2.2 Rescue/recover injured person or provide assistance to injured person in accordance with recognised standards/procedures |
| | 2.3 Make contact with the appropriate medical and rescue authorities |
| | 2.4 Record details of first aid given |
| 3. Identify codes of practice, standards and organisations that have an impact on the work of licensed electricians | 3.1 Identify the codes of practice that apply to work carried out by licensed electricians |
| | 3.2 Apply the fundamental safety procedures as outlined in AS/NZS 3000:2007 Electrical Installations (known as the Australian/New Zealand Wiring Rules) Part 1 |
| | 3.3 Identify the other relevant standards that apply to work carried out by licensed electricians |
| | 3.4 Identify other regulatory requirements that apply to work carried by licensed electricians |
| | 3.5 Identify reference compliance standards for electricity generation systems and electricity converters |
| | 3.6 Identify organisations that have an impact on the roles and responsibilities of licensed electricians |

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

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

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

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|---|--|
| Regulatory requirements include: | <ul style="list-style-type: none">• AS/NZS 3000:2007 Electrical installations (known as the Australian/New Zealand Wiring Rules)• AS/NZS 3008.1.1:2009 Electrical Installations – Selection of cables – Cables for alternating voltages up to and including 0.6/1 kV – typical Australian installation conditions• AS/NZS 3017:2007 Electrical installations – Verification guidelines• AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment• Electrical Safety Act (various states/territories)• electrical regulations (various states/territories)• local service rules• the Building Code of Australia |
| Compliance standards include: | <ul style="list-style-type: none">• AS/NZS 4777:2005 (series), Grid connected inverter systems• AS/NZS 5033:2014 Installation and safety requirements for photovoltaic (PV) arrays• AS/NZS 3010:2005 Electrical installations – Generating sets• AS/NZS 4509 (series), Stand-alone power systems• AS 3011.1:1992 Electrical installations – Secondary batteries installed in buildings |
| Organisations include: | <ul style="list-style-type: none">• Electrical Regulatory Authorities Council (ERAC)• Electrical Safety Office or equivalent (various states/territories)• Electrical Contractor Association or equivalent (various states/territories)• energy supply authorities• local TAFE |
| Safe working practices include: | <ul style="list-style-type: none">• demonstration of safe working practices and installation in accordance with industry established safe and sound practices |

Unit Mapping Information

Release 2. Equivalent. Minor adjustments to reflect ERAC requirements for electrician licensing and revision of Essential Performance Capabilities.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM13017 Apply safety practices, procedures and compliance standards associated with licensed electrical work

Modification History

Release 3. Prerequisite units updated

Release 2. Minor adjustments to reflect ERAC requirements for electrician licensing and revision of Essential Performance Capabilities

Release 1. New unit

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- determining the electrical and non-electrical isolation requirements to prevent the creation of hazards linked from the loss of machine/system/process control according to established procedures
- using lock out tag procedures with appropriate tags/signs
- preparing a safe work method statement (SWMS) or job safety analysis (JSA) in the absence of established procedures for effective isolation
- proving electrical isolation and following established safety rules prior to working on electrical equipment or wiring, including capacitor banks
- ensuring all electrical equipment and tools are tested and tagged and up to date
- supervising all electrical apprentices and trainees to the level determined by their training and competence
- working safely at heights and in confined spaces
- applying procedures for movement/treatment of injured, including:
 - safe rescue of victim from a live situation
 - clearing of airways
 - cardio-pulmonary resuscitation (CPR)
 - care of spinal injuries
 - treatment of cuts/lesions
 - treatment of burns/scalds
 - treatment of shock
- accessing and using other relevant standards associated with electrical installation work
- accessing and abiding by codes of practice and other regulatory requirements
- contacting (when appropriate) organisations for guidance and assistance.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- typical hazards and risks in an electrical installation, including:
 - effects on the human body of various levels of alternating current (AC) and direct current (DC) and duration of current flow for various current paths
 - risk of ignition of flammable materials due to the thermal effects of current or electric arcs in normal service of an electrical installation
 - risk of injury from mechanical movement of electrical actuated equipment
 - protection from direct contact (basic protection)
 - acceptable methods
 - use of extra-low voltage (ELV)
- procedures and principles used to control risks associated with these hazards, including:
 - the development of a work health and safety (WHS) policy
 - consultation with everyone involved in the workplace
 - providing information training
 - identifying and assessing hazards
 - implementing and following risk control measures
 - maintaining and improving the WHS program
- approved lock out and tag procedures, including:
 - purpose and use of SWMS or JSA
 - reasons for isolation
 - lock-off equipment and signage
 - tools and equipment to prove electrical isolation of circuit/installation/system including capacitor banks is dead
- testing and tagging guidelines for electrical equipment and tools in accordance with AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment
- level of supervision required by electrical apprentices and trainees
- safe use of ladders and elevated work platforms, and working at heights
- working in confined spaces, including the following:
 - identification of the hazards
 - assessing the risks
 - controlling the risks
 - emergency procedures
- workplace emergency procedures, including appropriate methods of rescue:
 - removal of the victim of electric shock, including live switchboard rescue from live low voltage conductors
 - release from contact with live high voltage conductors (no attempt should be made until circuit has been switched off)
 - risks associated with fallen distribution lines and the associated voltage gradients

- other points of danger, including:
 - fire
 - traffic
 - risks including chemicals
 - possibility of falls
- life support – CPR procedures, including duty of care
- appropriate use of fire extinguishers for given types of fires
- using carbon dioxide or dry chemical powder to fight electrical fires
- appropriate local medical and rescue services
- recording of first aid delivered
- codes of practice and regulatory requirements, including:
 - Electrical Safety Act or equivalent
 - Electrical Regulations or equivalent
 - Service Rules provided by local electricity distributors
 - Building Code of Australia
- AS/NZS 3000:2007 Electrical installations (known as the Australian/New Zealand Wiring Rules) Part 1 – Scope, application and fundamental principles in regards to the following:
 - scope and application
 - referenced documents
 - definitions
 - alterations, additions and repairs
 - alternative arrangements
 - protection for safety, including:
 - against both direct and indirect contact by use of ELV
 - against direct and indirect contact
 - use of residual current devices (RCDs)
 - thermal effects in normal service
 - unwanted voltages
 - over-current and fault currents
 - over-voltage
 - injury from mechanical movement
 - devices for isolation
 - fire integrity
 - design of an electrical installation, including:
 - protection, functioning and compatibility
 - supply characteristics
 - maximum demand
 - voltage drop
 - electrical installation circuit arrangements
 - external influences

- selection of electrical equipment, including:
 - safety requirements
 - external influences
 - adverse effects and interference
 - evidence of compliance
- installation of electrical equipment, including:
 - safe and sound practice
 - accessibility
 - information and identification
 - segregation
- inspection and testing, including:
 - visual inspection
 - continuity of earthing system
 - insulation resistance
 - polarity
 - correct circuit connections
- knowledge of hierarchy of standards
- normative/informative text
- other relevant standards associated with electrical installation work and testing and tagging of electrical equipment and tools
- Australian/New Zealand Wiring Rules requirements for electricity generation systems installation and electricity converters
- reference compliance standards, including:
 - AS/NZS 4777 (series), Grid connected inverter systems
 - AS/NZS 5033:2014 Installation and safety requirements for photovoltaic (PV) arrays
 - AS/NZS 3010:2005 Electrical installations – Generating sets
 - AS/NZS 4509 (series), Stand-alone power systems
 - AS 3011.1:1992 Electrical installations – Secondary batteries installed in buildings
- fundamental requirements of electricity generating systems, including:
 - DC polarity, including switching and protection devices
 - inverter principles
 - safe isolation and testing of systems
 - arrangement for connecting an alternative supply to an installation
 - earthing arrangements
- battery storage systems and requirements
- uninterruptible power supplies
- organisations that can have an impact of the role of the licensed electrician.

Assessment Conditions

- Assessors must:

- have vocational competency in applying safety practices, procedures and compliance standards associated with licensed electrical work at least to the level being assessed with relevant industry knowledge and experience
- satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* and comply with the *National Vocational Education and Training Regulator Act 2011* or equivalent legislation covering VET regulation in a non-referring State as the case requires.
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications.
- 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.

Links

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