



Australian Government

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

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.

Error in Knowledge Evidence corrected.

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 evaluate and modify low voltage (LV) lighting circuits, equipment and controls.

It includes working safely, identifying faults in luminaires and associated control equipment, repairing/replacing luminaire and control equipment components, ensuring all work complies with relevant Australian Standards and legislation, and completing work and documenting activities.

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.

Pre-requisite Unit

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

UEECD0019 Fabricate, assemble and dismantle utilities industry components

UEECD0020 Fix and secure electrotechnology equipment

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

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

UEEEL0021 Solve problems in magnetic and electromagnetic devices

UEEEL0020 Solve problems in low voltage a.c. circuits

UEEEL0023 Terminate cables, cords and accessories for low voltage circuits

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

Elements describe the essential outcomes

1 Prepare to work on lighting circuits

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element

- 1.1** Scope of work is obtained from relevant documentation, electrical drawings or relevant person/s
- 1.2** WHS/OHS requirements and workplace procedures for a given work area are identified and applied
- 1.3** Hazards are identified, risks are assessed and control measures are implemented
- 1.4** Advice is sought from work supervisor to ensure the work is coordinated effectively with others
- 1.5** Sources of materials required for work are determined in accordance with workplace procedures
- 1.6** Tools, equipment and testing devices required to carry out work are obtained and checked for correct operation and safety

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|--|---|
| 2 Evaluate and modify lighting circuits | <ul style="list-style-type: none">2.1 Equipment and circuits are checked and arrangement identified2.2 Circuits are checked and isolated in accordance with workplace procedures and regulatory requirements2.3 The need to test or measure live work is determined in accordance with WHS/OHS requirements and when necessary conducted in accordance with workplace procedures2.4 Fault/s and probable cause/s are identified from measured and calculated values as they apply to lighting equipment2.5 Required components are identified and replaced in accordance with manufacturer specifications and industry standards2.6 Unexpected situations are dealt with safely and with the approval of relevant person/s |
| 3 Complete work and document activities | <ul style="list-style-type: none">3.1 WHS/OHS work completion risk control measures and workplace procedures are followed3.2 Worksite is cleaned and made safe in accordance with workplace procedures3.3 Justification for solutions used to modify circuits and equipment is documented3.4 Work completion is documented and an appropriate person/s notified 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.

Evaluating and modifying lighting circuits, equipment and controls must be demonstrated in two of the following settings:

- commercial
- industrial
- domestic.

Unit Mapping Information

No equivalent unit

Links

Companion Volume Implementation Guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls

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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:

- # applying work health and safety (WHS)/occupational health and safety (OHS) workplace procedures, including:
 - # identifying and assessing hazards and risks, and implementing control measures
- # checking circuits are isolated in accordance with workplace procedures and regulatory requirements
- # determining the operating parameters of existing lighting circuits and equipment
- modifying existing lighting circuits and their controls to comply with specified operating parameters, including drawing and connecting lighting circuits that incorporate:
 - one-way
 - two-way
 - # intermediate switching of light points using the loop at the light/switch methods of thermoplastic sheathed (TPS) wiring
- # developing lighting circuits and equipment to comply with a specified function and operating parameters
- # determining the cause of low illuminance level in existing lighting circuits and equipment
- determining conditions causing existing lighting circuits and equipment to be unsafe
- # connecting lighting equipment and controls
- # identifying faulty components in luminaires and auxiliary/control equipment from test results
- # testing luminaires and auxiliary/control equipment for serviceability
- ensuring all work complies with relevant Australian Standards and legislation
- completing work and documenting activities.

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:

- loop at the light method of wiring lighting circuits
- loop at the switch method of wiring lighting circuits
- installation methods of accessories and wiring for a lighting circuit incorporating one-way, two-way and intermediate switching of lighting points using the loop at the light/switch method of TPS wiring
- TPS cabling requirement for the loop at the light/switch circuit
- correct operation of the installed circuits including testing for compliance with industry standards
- emergency and evacuation lighting and lighting control, including:
 - factors and requirements of emergency and evacuation lighting concerning illumination levels, luminaire positioning and operating period
 - characteristics of maintained, non-maintained and sustained emergency lighting systems
 - arrangement of batteries in point and central bank emergency lighting supply systems
 - lighting control methods
- principles of lighting technology, including:
 - basic electrical terminology
 - colour theory
 - lighting techniques
- local Supply Authority requirements for maintaining high power factor
- terminology, principles and standards relevant to lighting (energy efficiency as per National Construction Code (NCC))
- types of luminaires:
 - different types of luminaires, their features and purpose
 - operation of different types of luminaires
 - expected lamp life, colour rendering and efficacy for typical types of different types of luminaires
- lighting circuits, equipment and controls used for the following applications:
 - commercial
 - industrial
 - domestic
- lighting layout in terms of visual comfort and relevant Australian Standards
- Australian Standards and local requirements for lighting
- light-emitting diode (LED) lighting and its applications
- Neon, Argon and Xenon lighting and their applications
- comparison of incandescent, low intensity discharge, high intensity discharge, LED and other types of lighting
- fire protection – residential fire and smoke alarms, including:

- types of fire and smoke alarms
- regulations and standards requirements regarding residential fire and smoke alarms
- locations for residential fire and smoke alarms
- wiring methods for residential fire and smoke alarms
- operation of typical residential fire and smoke alarms
- identifying faults in luminaires and auxiliary/control equipment, including circuit and wiring diagrams of common lighting circuits, including:
 - common fault symptoms and associated causes
 - common faults in luminaires and auxiliary/control equipment
 - techniques for repairing/replacing faulty lighting components
- input and output parameters of equipment incorporating electronic components for; controlling/switching lighting, auxiliary control equipment, energy measurement and control, rectifying and inverting electrical supplies
- hazards and safety requirements related to equipment incorporating electronic components used in electrical systems
- relevant manufacturer specifications.

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 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 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

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