



Australian Government

UEEEL0079 Plan and analyse LV electrical apparatus

Release: 1

UEEEL0079 Plan and analyse LV electrical apparatus

Modification History

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

Application

This unit covers planning and analysing the correct operation of single and three phase low voltage electrical apparatus. It covers planning their use in electrical installations, apparatus arrangements, and issues related to operation, characteristics, protection and solutions to apparatus problems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

NIL

Competency Field

Electrical

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to plan and analyse single and three phase low voltage electrical apparatus

PERFORMANCE CRITERIA

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

- 1.1** Work, health and safety (WHS) / occupational health and safety (OHS) risk control measures are identified and applied
- 1.2** Apparatus to be analysed, and scope of work to be undertaken are identified and confirmed

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|---|------------|---|
| | 1.3 | Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety |
| 2 Plan and analyse single and three phase low voltage electrical apparatus | 2.1 | Apparatus is confirmed as being isolated where necessary in accordance with WHS/OHS requirements |
| | 2.2 | Apparatus is analysed using measured and calculated values as they apply to single and three-phase low voltage apparatus |
| | 2.3 | Apparatus problems are identified from analysis and solutions for rectification are recommended |
| | 2.4 | The use of apparatus in a specified electrical installation is planned in accordance with requirements |
| 3 Complete and document work | 3.1 | Results of analysis are recorded |
| | 3.2 | Justification for apparatus selection and installation planning is documented |
| | 3.3 | Work completion is documented and stored in an appropriate location |

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 Electrotechnology Training Package Companion Volume Implementation Guide.

Unit Mapping Information

This is a new 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 UEEEL0079 Plan and analyse LV electrical apparatus

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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 and performance criteria on at least two separate occasions and include:

- analysing the operating parameters of existing apparatus
- recommending alterations to existing apparatus to comply with specified operating parameters
- determining the cause of problems in existing apparatus
- recommending solutions for identified apparatus problems
- determining conditions causing existing apparatus to be unsafe
- justifying selection of apparatus for a specified range of applications and operating parameters
- planning apparatus installation in accordance with requirements.

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:

- lighting including:
 - wiring diagrams for lighting circuits
 - switching methods for lighting circuits
 - cabling requirements for lighting circuits
 - correct operation of installed lighting circuits
 - required compliance testing
 - basic concepts, terminology, principles and standards relevant to lighting
 - types of luminaires and incandescent lamps
 - operation of different lamp types including their control equipment
 - expected lamp life, colour rendering and efficacy for different lamp types
 - lighting layout in terms of visual comfort and relevant Australian standards
 - types of low intensity discharge lamps
 - types of high intensity discharge lamps

- LED lighting and its applications
- Neon, Argon and Xenon lighting and their applications
- power factor requirements
- comparison of incandescent, low intensity discharge, high intensity discharge, LED and other types of lighting
- 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
- 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
 - operation of typical residential fire and smoke alarms
- electrical heating control devices including:
 - methods of manual heat control
 - methods of automatic heat control
 - types and application for common thermostats
 - operation of common thermostats
 - sensitivity and differential of thermostats
 - testing of a thermostat
 - applications and operation of simmerstats
 - electronic heat control (phase control and zero voltage switching)
- fixed electrical heating appliances including:
 - determining the heat energy in joules and kWh in a simple heating process
 - methods of heat transfer
 - determining the heat energy input and output of a heating process
 - operation of reverse cycle air conditioning
- electrical water heater operation including:
 - types of water heaters (instantaneous and storage) and their methods of control
 - intrinsic safety (pressure relief and thermal cut-out)
 - testing of over temperature cut-out point of a thermostat
 - switchboard requirements to supply a controlled load water heater
 - internal circuit of a twin element water heater, and supply connections
 - solar heating system and its integration into an installation
- alternative supplies including:
 - reasons for the installation of alternative supplies
 - types of alternative supply systems

- characteristics and operation of uninterruptible power supplies (UPSs)
- batteries including:
 - common types of primary cells and secondary batteries and typical applications
 - terminal voltage of common primary cells and secondary cells
 - correct storage, handling and disposal techniques for cells and batteries
 - charge/discharge cycle for a secondary cell
 - effect of internal resistance on a secondary cell
 - state of charge of a secondary cell
 - commissioning procedures for various secondary batteries
 - safe working procedures when working with secondary cells and batteries.

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 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, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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