



Australian Government

UEECD0045 Solve problems in multiple path extra-low voltage (ELV) a.c. circuits

Release: 1

UEECD0045 Solve problems in multiple path extra-low voltage (ELV) a.c. circuits

Modification History

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 solve problems in multiple path extra-low voltage (ELV) alternating current (a.c.) circuits.

It includes working safely, applying problem-solving procedures, measuring devices, and providing solutions from measurements and calculations to problems in multiple path circuits.

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) 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, skills and knowledge described in this unit require a relevant contract of training, such as an Australian Apprenticeship.

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.

Permits may also be required for some work environments, such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

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

Pre-requisite Unit

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

Cross Discipline

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to work on multiple path ELV a.c. electrical circuits

2 Solve multiple path ELV a.c circuit problems

PERFORMANCE CRITERIA

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

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|------------|---|
| 1.1 | Work health and safety (WHS)/occupational health and safety (OHS) processes and workplace procedures for a given work area are identified, obtained and applied |
| 1.2 | WHS/OHS risk control measures and workplace procedures in preparation for the work are followed |
| 1.3 | Scope of circuit problem is obtained from documentation and/or work supervisor |
| 1.4 | Advice is sought from work supervisor to ensure work is coordinated effectively with others |
| 1.5 | Sources of materials required for work are identified and accessed in accordance with workplace procedures |
| 1.6 | Tools, equipment and testing devices required for work are obtained and checked for correct operation and safety |
| 2.1 | WHS/OHS risk control work measures and workplace procedures are followed |
| 2.2 | Need to test and measure live work is determined in accordance with WHS/OHS requirements and workplace procedures |
| 2.3 | Circuits are checked and isolated, as required, in accordance with WHS/OHS requirements and workplace procedures |
| 2.4 | Methods are used to solve a.c circuit problems from measured and calculated values as they apply to multiple |

		path electrical circuits
	2.5	Unplanned situations are dealt with safely in accordance with workplace procedures and approval of relevant person/s
	2.6	Problems are solved without damage to apparatus, circuits, the surrounding environment or services using sustainable energy practices
3	Complete work and document problem-solving activities	3.1 WHS/OHS work completion risk control measures and workplace procedures are followed 3.2 Worksite is cleaned and made safe in accordance with workplace procedures 3.3 Justification for solutions used to solve circuit problems is documented 3.4 Work completion is documented and relevant 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.

Circuit problems must include at least two of the following:

- determining the operating parameters of an existing circuit
- altering an existing circuit to comply with specified operating parameters
- developing circuits to comply with a specified function and operating parameter

Unit Mapping Information

This unit replaces and is equivalent to UEENEEE119A Solve problems in multiple path extra-low voltage (ELV) a.c. circuits.

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 UEECD0045 Solve problems in multiple path extra-low voltage (ELV) a.c. circuits

Modification History

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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 relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including
 - using risk control measures
- checking and isolating circuits
- identifying and assessing sources of materials required for work
- obtaining and checking tools, equipment and testing devices for correct operation and safety using sustainable energy practices
- obtaining scope of circuit/s from documentation and/or work supervisor
- preparing to work on multiple path extra-low voltage (ELV) alternating current (a.c.) electrical circuits
- seeking advice from the work supervisor
- solving a.c. circuits problems from measuring and calculating values
- testing and measuring live circuits
- dealing with unplanned situations safely and with the approval of relevant person/s
- workplace documenting, including:
 - justifications solution
 - work completion.

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:

- problem-solving techniques
- relevant capacitance in a.c. circuits
- relevant impedance
- relevant inductance in a.c. circuits
- relevant isolation of circuits

- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications and operating instructions
- relevant materials, tools, equipment and testing devices
- relevant methods to measure and calculate values
- relevant phasors
- relevant power and power factor
- relevant resistance in a.c. circuits
- relevant resonance
- relevant sinusoidal alternating voltage and current
- relevant test and measure live work procedures
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies and procedures
- sustainable energy principles.

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 suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated suitable 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 simulations
- relevant and appropriate materials, tools, facilities and equipment used in industry
- resources that reflect current industry practices in relation to solving problems in multiple path ELV a.c. circuits
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

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