



Australian Government

UEECD0036 Provide engineering solutions for problems in complex multiple path circuits

Release: 1

UEECD0036 Provide engineering solutions for problems in complex multiple path 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 provide engineering solutions for problems in complex multiple path circuits.

It includes preparing tools, equipment and materials; and providing solutions for complex multiple path circuits. It also includes completing work and documentation.

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

Pre-requisite Unit

Not applicable

Competency Field

Cross Discipline

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare tools, equipment and materials for problem solving

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 work preparation measures and workplace procedures are followed |

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|--|---|
| | <p>1.3 Scope of circuit/s problems are obtained from documentation and/or work instructions to determine the work</p> <p>1.4 Advice is sought from the work supervisor to ensure the work is coordinated with others</p> <p>1.5 Materials required for work are identified and accessed in accordance with workplace procedures</p> <p>1.6 Tools, equipment and testing devices required for work are obtained and checked for correct operation and safety</p> |
| <p>2 Provide solutions for complex multiple path circuits</p> | <p>2.1 WHS/OHS risk control work measures and workplace procedures are followed</p> <p>2.2 Inspect and test live work is conducted in accordance with WHS/OHS requirements and workplace procedures</p> <p>2.3 Circuits are checked and isolated as required in accordance with WHS/OHS requirements and workplace procedures</p> <p>2.4 Methods used to solve circuit problems are used from measured and calculated values as they apply to complex multiple path circuits</p> <p>2.5 Unplanned situations are dealt with in accordance with WHS/OHS and approval of a relevant person</p> <p>2.6 Problems are solved without damage to apparatus, circuits, the surrounding environment and/or services using sustainable energy practices</p> |
| <p>3 Complete work and documentation</p> | <p>3.1 WHS/OHS work completion risk control measures and workplace procedures are followed</p> <p>3.2 Worksite is cleaned and made safe in accordance with workplace procedures</p> <p>3.3 Justification for solutions used to solve circuit problems is documented</p> <p>3.4 Work completion is documented and relevant person/s notified in accordance with workplace procedures</p> |

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.

- Solving 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 parameters
 - developing circuits to comply with specified functions using established methods

Unit Mapping Information

This unit replaces and is equivalent to UEENEEE125A Provide engineering solutions for problems in complex multiple path 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 UEECD0036 Provide engineering solutions for problems in complex multiple path 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:

- analysing complex multiple path circuits
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including
 - using risk control measures
- completing work and documenting problem-solving activities
- completing written justification of solutions
- coordinating work with others
- dealing with unplanned events in accordance with problem-solving techniques and workplace procedures
- determining the operating parameters of existing circuits
- inspecting and testing active systems
- obtaining and following work instructions
- obtaining and using tools, equipment and products
- preparing to solve problems in complex multiple path circuits
- providing effective solutions to circuit problems from measurements and calculations
- providing solutions for problems in complex multiple path circuits
- using sustainable energy practices in accordance with workplace procedures
- using testing devices.

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:

- complex alternating current (a.c.) power and maximum power transfer theorem
- complex impedance
- mesh and nodal analysis for a.c. linear circuits
- mesh and nodal analysis for direct current (d.c.) linear circuits

- Norton's principles for d.c. linear circuits
- phasors
- problem-solving techniques
- relevant complex multiple path circuits
- relevant industry standards
- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications and operating instructions
- relevant materials, tools, equipment, product and testing devices
- relevant sustainable energy principles
- relevant tools, equipment and products
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace instructions, policies and procedures
- series and parallel a.c. linear circuits
- star-delta conversions
- superposition principles and Kirchhoff's law applied to a.c. linear circuits
- superposition principles for d.c. linear circuits
- Thévenin and Norton theorems applied to a.c. linear circuits
- Thévenin's principles for d.c. linear circuits
- transients
- voltage/current sources and Kirchhoff's law for d.c. linear circuits.

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, facilities, tools, equipment and personal protective equipment (PPE) currently used in industry
- resources that reflect current industry practices in relation to solving problems in complex multiple path circuits.
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

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