



Australian Government

UEEEEC0074 Troubleshoot resonance circuits in an electronic apparatus

Release: 1

UEEEEC0074 Troubleshoot resonance circuits in an electronic apparatus

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 troubleshoot resonance circuits in an electronic apparatus.

It includes working safely, applying problem-solving procedures, and providing solutions derived from measurements and calculations to problems in resonance circuits.

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

No 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

Electronics and Communications

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.

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

1 Prepare to troubleshoot resonance circuits

- 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
- 1.3** Scope of fault is obtained from documentation and/or work supervisor to determine work to be undertaken
- 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 for work are obtained and checked for correct operation and safety

2 Solve problems in resonance circuits

- 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 in accordance with WHS/OHS requirements and workplace procedures
- 2.4** Fault finding of resonance circuits is conducted using measured and calculated values of parameters in accordance with workplace procedures
- 2.5** Unplanned situations are dealt with safely and with the approval of relevant person/s in accordance with workplace procedures
- 2.6** Fault-finding activities are carried out efficiently without waste of materials or damage to apparatus, the surrounding environment or services using sustainable energy practices

3 Complete work and document troubleshooting 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 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.

Solving resonance 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 specified function and operating parameters

Unit Mapping Information

This unit replaces and is equivalent to UEENEEH114A Troubleshoot resonance circuits in an electronic apparatus.

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 UEEEC0074 Troubleshoot resonance circuits in an electronic apparatus

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
- carrying out fault-finding activities without waste and damage to materials, apparatus, the environment or services
- checking and isolating circuits
- completing work and documenting troubleshooting activities
- dealing with unplanned situations safely and with the approval of relevant person/s
- demonstrating correct set-up and usage of oscilloscope for alternating current (a.c.) measurements
- obtaining and checking tools, equipment and testing devices for correct operation and safety
- obtaining scope of the fault from documentation and/or work supervisor
- preparing to troubleshoot resonance circuits
- seeking advice from work supervisor to ensure work is coordinated effectively
- solving problems in resonance circuits
- testing and measuring live circuits
- using sustainable energy practices
- calculating resonance parameters, including reactance and resonant frequency from supplied or measured values
- making measurements on resonance circuits
- making adjustments to resonance circuits.

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:

- filter characteristics, including bandwidth, roll off, attenuation and response curves

- filter principles and types, including high pass, low pass, bandpass and band-reject
- principles of inductance and inductive reactance
- impedance, voltage and current characteristics of parallel-resonant circuits
- impedance, voltage and current characteristics of series-resonant circuits
- measuring equipment for a.c. circuits
- Ohm's law for a.c. circuits
- power factor principles
- problem-solving techniques
- quality factor (Q) principles
- relevant checking and isolation methods for circuits
- relevant circuit measurements and parameter values calculations
- relevant industry standards
- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications and operating instructions
- relevant materials, tools, equipment and testing devices
- relevant resonance circuits
- relevant resonance formulae and definitions
- relevant testing and measuring methods
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace instructions, policies and procedures
- series, parallel and series-parallel a.c. circuits
- sinusoidal alternating voltage and current principles
- sustainable energy principles
- transformer principles and construction.

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 currently used in industry
- resources that reflect current industry practices in relation to troubleshooting frequency

dependent circuits

- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

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