Australian Government

Assessment Requirements for UEEEL0021 Solve problems in magnetic and electromagnetic devices

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.

Assessor requirements updated in Assessment Conditions.

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

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) requirements, including:
  - identifying hazards and assessing risks and applying control measures
  - confirming isolation of circuits
- using methodological techniques to solve problems in circuits with an electromagnetic device from measured and calculated values
- determining the operating parameters of an existing circuit with an electromagnetic device, including:
  - the direction of magnetic field around a current-carrying conductor and a coil
  - a current-carrying conductor under the influence of a magnetic field
- modifying an existing circuit with an electromagnetic device to comply with specified operating parameters
- connecting electromagnetic devices to comply with a specified function and operating parameters
- 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:

- magnetism, including:
  - common magnetic and non-magnetic materials
  - magnetic field patterns of magnets

- magnets attraction and repulsion when brought in contact with each other
- practical applications of magnets
- principle of magnetic screening (shielding) and its applications
- electromagnetism, including:
  - conventions representing direction of current flow in a conductor
  - direction of force between adjacent current-carrying conductors
  - effect of current, length and distance apart on the force between conductors
  - magnetic field around an electromagnet, a single conductor and two adjacent conductors carrying current
  - magnetomotive force (mmf) and its relationship to the number of turns in a coil and the current flowing in the coil
  - practical applications of electromagnets
- magnetic circuit types and associated terminology
- methods used to reduce electrical losses in a magnetic circuit
- electromagnetic induction, including:
  - principle of electromagnetic induction
  - applications of electromagnetic induction
  - Lenz's law
- inductance, including:
  - applications of the different types of inductors
  - industry standard symbols for inductors
  - types of inductor cores
  - construction of an inductor
  - definition of terms: self-induction, inductance and mutual inductance, and time constants
  - effect of physical parameters on the inductance of an inductor
  - relationship between load voltage, current and self-induced electromagnetic force in a direct current (d.c.) circuit having inductance
  - practical applications for the effects of self and mutual induction
  - undesirable effects of self and mutual induction
- magnetic principles in measurement instruments
- magnetic devices, including:
  - operation and application of:
    - magnetic sensing devices
    - contactors and relays
    - solenoids
  - magnetic methods used to extinguish the arc between opening contacts
- 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 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, 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.

Links

Companion Volume Implementation Guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6