



Australian Government

Assessment Requirements for UEEEL0019

Solve problems in direct current (d.c.) machines

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:

- complying work health and safety (WHS)/occupational health and safety (OHS) requirements, including:
 - identifying safety risks associated with using generators, motors, rotating machinery and inductive loads
 - confirming isolation of circuits
- connecting and testing a direct current (d.c.) machine
- identifying of faults in a machine from electrical measurements
- recording electrical measurements and comparing with nameplate ratings
- reversing the direction of rotation of a d.c. motor
- ensuring all work complies with relevant industry standards and legislation
- completing required documentation and reporting.

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:

- rotating machine construction, testing and maintenance, including:
 - care, maintenance and testing processes for rotating machines
 - components of a d.c. machine
 - difference between a generator and a motor in terms of energy conversion
 - nameplate of a machine
 - safety risks associated with using rotating machinery
 - types of faults in electric machines
- generators, including:
 - basic operation of a d.c. generator
 - equivalent circuit for a d.c. generator
 - importance of residual magnetism for a self-excited generator
 - load characteristics of a d.c. generator
 - methods of excitation used for d.c. generators
 - open circuit characteristics of d.c. generators
 - prime movers, energy sources and energy flow used to generate electricity
 - reversing the polarity of a d.c. generator
 - types of d.c. generators and their applications
 - calculating generated and terminal voltage of a d.c. shunt generator
 - applying Fleming's left-hand rule for motors and right-hand rule for generators
- motors, including:
 - basic operation of a motor
 - circuit diagrams and characteristics of the different types of d.c. motors
 - effect of back emf in d.c. motors
 - equivalent circuit for the types of d.c. motors
 - operation of a motor and its energy flow
 - safety risks associated with using motors (including risks of series d.c. motors)
 - torque as the product of the force on the conductors and the radius of the armature/rotor
 - calculating force and torque developed by a motor
 - types of d.c. motors and their applications
- machine efficiency, including:
 - efficiency characteristic of a d.c. machine and the conditions for maximum efficiency
 - losses that occur in a d.c. machine
 - methods used to determine the losses in a d.c. machine
 - calculating losses and efficiency of a d.c. machine
 - methods used to maintain high efficiency
- safety considerations for inductive loads
- 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>