



Australian Government

UEENEEG160A Evaluate performance of LV electrical machines

Release: 2

UEENEEG160A Evaluate performance of LV electrical machines

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers electrical and mechanical safety and performance evaluation of electrical machines across their load range. The unit encompasses working safely, setting up and conducting evaluation measurements, evaluating performance from measured parameters and documenting results and recommending any resulting corrective actions.

Application of the Unit

Application of the Unit 2)

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training. It applies to any formal recognition for this standard at the aligned AQF 6 level.

Licensing/Regulatory Information

License to practice 3)

The skills and knowledge described in this unit may require a license to practice in the workplace subject to regulations for undertaking of electrical work. Practice in workplace and during training is also subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

License to practice**3)**

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control and lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical devices and site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites**Prerequisite Unit(s)****4)****Competencies****4.1)**

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEG1 57A	Conduct electrical tests on LV electrical machines
UEENEEE1 01A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE1 02A	Fabricate, assemble and dismantle utilities industry components
UEENEEE1 04A	Solve problems in d.c. circuits
UEENEEE1 05A	Fix and secure electrotechnology equipment
UEENEEE1 07A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG0	Solve problems in single and three phase

Prerequisite Unit(s)	4)
	06A low voltage machines
	UEENEEG1 01A Solve problems in electromagnetic devices and related circuits
	UEENEEG1 02A Solve problems in low voltage a.c. circuits
	UEENEEG1 06A Terminate cables, cords and accessories for low voltage circuits
	AND
	UEENEEG1 50A Wind electrical coils
	UEENEEG1 51A Place and connect electrical coils
	UEENEEG1 53A Rewind three phase low voltage induction machines
	OR
	UEENEEG0 33A Solve problems in single and three phase electrical apparatus and circuits
	UEENEEG0 63A Arrange circuits, control and protection for general electrical installations
	UEENEEG1 08A Trouble-shoot and repair faults in low voltage electrical apparatus and circuits
	AND
	UEENEEG1 43A Develop engineering solution for synchronous machine and control problems
	UEENEEG1 49A Provide engineering solutions to problems in complex polyphase power circuits
	UEENEEE1 25A Provide engineering solutions for problems in complex multiple path circuit
	UEENEEE1 26A Provide solutions to basic engineering computational problems
	AND

Prerequisite Unit(s)	4)
	UEENEEE1 29A Solve electrotechnical engineering problems
	OR
	UEENEEE1 01A Apply Occupational Health and Safety regulations, codes and practices in the workplace
	UEENEEE1 04A Solve problems in d.c. circuits
	UEENEEG1 01A Solve problems in electromagnetic devices and related circuits
	OR
	UEENEEH1 14A Troubleshoot resonance circuits in an electronic apparatus
	UEENEEE1 01A Apply Occupational Health and Safety regulations, codes and practices in the workplace
	AND
	UEENEEE1 04A Solve problems in d.c. circuits
	OR
	UEENEEH1 69A Solve problems in basic electronic circuits
	OR
	UEENEEG1 44A Develop engineering solutions for d.c. machine and control problems
	UEENEEE1 25A Provide engineering solutions for problems in complex multiple path circuit
	UEENEEE1 26A Provide solutions to basic engineering computational problems
	AND
	UEENEEE1 Solve electrotechnical engineering

Prerequisite Unit(s)	4)	
	29A	problems
	OR	
	UEENEEE1 01A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
	UEENEEE1 04A	Solve problems in d.c. circuits
	UEENEEG1 01A	Solve problems in electromagnetic devices and related circuits
	OR	
	UEENEEH1 14A	Troubleshoot resonance circuits in an electronic apparatus
	UEENEEE1 01A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
	AND	
	UEENEEE1 04A	Solve problems in d.c. circuits
	OR	
	UEENEEH1 69A	Solve problems in basic electronic circuits
	OR	
	UEENEEG1 45A	Develop engineering solutions for induction machine and control problems
	UEENEEG1 49A	Provide engineering solutions to problems in complex polyphase power circuits
	UEENEEE1 25A	Provide engineering solutions for problems in complex multiple path circuit
	UEENEEE1 26A	Provide solutions to basic engineering computational problems
	AND	

Prerequisite Unit(s)	4)
	UEENEEE1 29A Solve electrotechnical engineering problems
	OR
	UEENEEE1 01A Apply Occupational Health and Safety regulations, codes and practices in the workplace
	UEENEEE1 04A Solve problems in d.c. circuits
	UEENEEG1 01A Solve problems in electromagnetic devices and related circuits
	OR
	UEENEEH1 14A Troubleshoot resonance circuits in an electronic apparatus
	UEENEEE1 01A Apply Occupational Health and Safety regulations, codes and practices in the workplace
	AND
	UEENEEE1 04A Solve problems in d.c. circuits
	OR
	UEENEEH1 69A Solve problems in basic electronic circuits

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 5 Writing 5 Numeracy 5

Employability Skills Information

Employability Skills 5)

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit
 Performance Criteria describe the required performance needed to demonstrate achievement of the element.
 Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1 Prepare to evaluate electrical machines.	1.1 OHS procedures for a given work area are identified, obtained and understood.
	1.2 Established OHS risk control measures and procedures in preparation for the work are followed.
	1.3 Examination and testing area is checked for safety hazards and risk control measures implemented in strict accordance with safety policy and procedures.
	1.4 Relevant documentation is obtained and read to determine the certification/approval specifications for which the equipment is to be assessed.
	1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.

ELEMENT	PERFORMANCE CRITERIA
2 Evaluate electrical machines.	<p>1.6 Tools, testing devices, and materials needed to carry out the work are obtained and checked for correct operation and safety.</p> <p>2.1 OHS risk control measures and procedures for carrying out the work are followed.</p> <p>2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.</p> <p>2.3 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.</p> <p>2.4 In depth knowledge of the performance requirements of the particular electrical machine under scrutiny is applied to the assessment process.</p> <p>2.5 Machine examination and tests are set up in accordance with established test methods and procedures for each particular parameter under scrutiny.</p> <p>2.6 Machine examination and tests are carried out methodically and results and comments systematically noted.</p> <p>2.7 Unexpected situations are dealt with safely and with the approval of an authorised person.</p> <p>2.8 Assessment is carried out without damage to systems, circuits, the surrounding environment or services and using sustainable energy practices.</p>
3 Complete work and document evaluate results.	<p>3.1 OHS work completion risk control measures and procedures are followed.</p> <p>3.2 Work site is cleaned and made safe in accordance with established procedures.</p> <p>3.3 Examination and test results are evaluated and non-compliance issues identified.</p>

ELEMENT**PERFORMANCE CRITERIA**

- 3.4 Examination, test results and comments on non-compliance issues are documented and reported to appropriate person(s) in accordance with established procedures.

Note 1:

Examples of documentation are those specifying safety requirements, technical standard, as marketed technical performance and product quality endorsement standards.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and evaluating performance of electrical machines.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EG160A Performance standards and regulatory requirements for the electrical rotating machine

Evidence shall show an understanding of evaluating the performance of electrical machines to an extent indicated by the following aspects:

T1 Additional technical standards, regulations and codes for special electrical installations encompassing:

- caravan parks
- construction and demolition sites
- marinas
- medical treatment areas
- moveable premises
- HV installation in consumer's premises

T2 Electrical machines, performance monitoring encompassing:

- Methods of testing the condition of bearings
- Methods of testing the condition of windings and terminal boxes.
- Methods of testing the condition of the coolers
- Problems likely to be created due to lack of maintenance on brush gear.
- Method of testing the general condition of a machine by vibration analysis
- Methods of checking the condition of couplings, pulleys, belts and the like.
- Determining machine operating efficiency

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment 9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit 9.2)

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
 - Apply sustainable energy principles and practices as specified in the performance criteria and range statement
 - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
 - Demonstrate an appropriate level of skills enabling employment
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Evaluate performance of electrical machines as described as described in 8) and including:
 - A Interpreting compliance documents.
 - B Setting up and conducting appropriate examinations and tests.
 - C Identifying non-compliance defects.
 - D Reporting examination and test results and non-compliance

issues clearly and accurately.

E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

**Context of and
specific
resources for
assessment** 9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved

industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to evaluating performance of electrical machines.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 ‘Assessment Guidelines’.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEG15 Conduct mechanical tests on electrical machines
9A and components

Range Statement

RANGE STATEMENT

10) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to at least two different types of electrical machine:

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field	11)
	Electrical