Australian Government

UEENEEG159A Conduct mechanical tests on electrical machines and components

Release: 2

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

UEENEEG159A Conduct mechanical tests on electrical machines and components

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers mechanical safety and functional testing of electrical machines and their mechanical components. The unit encompasses working safely, setting up and conducting tests, taking measurements, interpreting and documenting test results and 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.

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.

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.

UEENEEG157A	Conduct electrical tests on LV electrical machines
UEENEEE101A	Apply Occupational Health and Safety regulations, codes and practices in the workplace
UEENEEE102A	Fabricate, assemble and dismantle utilities industry components
UEENEEE104A	Solve problems in d.c. circuits
UEENEEE105A	Fix and secure electrotechnology equipment
UEENEEE107A	Use drawings, diagrams, schedules, standards, codes and specifications
UEENEEG006A	Solve problems in single and three phase low voltage machines
UEENEEG101A	Solve problems in electromagnetic devices and related circuits
UEENEEG102A	Solve problems in low voltage a.c. circuits
UEENEEG106A	Terminate cables, cords and accessories for low voltage circuits

AND

UEENEEG150A	Wind electrical coils
UEENEEG151A	Place and connect electrical coils
UEENEEG1	Rewind three phase low voltage induction

Prerequisite Unit(s) **4)**

53A	machines
OR	
UEENEEG033A	Solve problems in single and three phase electrical apparatus and circuits
UEENEEG063A	Arrange circuits, control and protection for general electrical installations
UEENEEG108A	Trouble-shoot and repair faults in low voltage electrical apparatus and 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 4 Writing 4 Numeracy 4

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 conduct mechanical tests on electrical machines.	1.1	OHS procedures for a given work area are identified, obtained and understood.
		1.2	Established OHS risk control measures for work preparation are followed.
		1.3	The extent of the work is determined from job sheets, specifications and regulatory requirements.
		1.4	Advice is sought from the work supervisor to ensure the work is coordinated effectively with others.
		1.5	Machine data is obtained from data records or directly from measurements and recorded in accordance with established procedures.
		1.6	Winding is stripped from stator in accordance with established procedures.
		1.7	Materials required for the work are obtained in accordance with established procedures.
		1.8	Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2	Conduct mechanical tests on three phase induction machines.	2.1	Established OHS risk control work measures are followed.
		2.2	Machines/equipment are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
			Note:

ELEMENT	PERFORMANCE CRITERIA	
		Particular attention shall be given to following risk control measure related to high voltage hazards
	2.3	All necessary mechanical tests/measurements are conducted to established cause of faults or operational condition of the machine.
	2.4	Status of the machine is determined from test results and recorded.
	2.5	Prescribed solutions are used to resolve work completion issues.
	2.6	Routine quality checks are conducted to ensure coils are correctly wound with correct wire, number of turns and shape.
	2.7	Work is completed in acceptable timeframe given environment and workplace conditions.
3 Complete work report.	3.1	OHS measures work completion risk controls are followed.
	3.2	The status of the machine including specifications for any repair work required is documented in accordance with established procedures and appropriate person(s) notified.

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 conducting mechanical tests on electrical machines.

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

KS01-EG159A Electric motor mechanical measuring and testing devices and techniques

Evidence shall show an understanding of electric motor mechanical measuring and testing devices and techniques to an extent indicated by the following aspects:

T1 Devices and techniques for measuring geometric attributes encompassing:

- Measuring device for geometric attributes.
- Dynamic balancing.
- Alignment of shafts.

T2 Operational Test/measuring devices and their application encompassing:

- Operational test/measuring devices.
- Applications.

T3 Setting up test/measuring devices encompassing:

- safety procedures
- set up procedures

T4 Taking and interpreting readings encompassing:

- Correct method.
  - Taking and interpreting reading
  - Dynamic balancing
  - Aligning shafts
  - Measuring roundness

T5 Storage, maintenance and care of test/measuring devices encompassing:

- Storage of mechanical measuring and testing devices.
- maintenance of mechanical measuring and testing devices.
- Care of mechanical measuring and testing devices

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, polices and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Conduct mechanical tests on electrical machines as described in 8) and including:

A Dismantling machine and storing parts securely.

B Setting up tests correctly.

C Taking test/measurements reading accurately.

D Determining the status of the machine correctly from test result.

E Documenting the status of the machine clearly.

F 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.

Note:

Successful completion of relevant vendor training may be used to contribute to evidence on which competency is deemed. In these cases the alignment of outcomes of vendor training with performance criteria and critical aspects of evidence shall be clearly identified.

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 conducting mechanical tests on 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 electrical tests on LV electrical machines 7A

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

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 conducting mechanical tests on at least two different electrical mechanical with one of the machines having at least two mechanical faults. The purpose of the tests is to establishing:

- The causes of faults in machines, and
- Whether a machine has been correctly repaired and complies with all requirements

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