Australian Government

UEPOPS362A Operate and Monitor Generator/Alternator

Release: 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

UEPOPS362A Operate and Monitor Generator/Alternator

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit deals with the skills and knowledge required to operate, inspect and monitor a Generator/Alternator

Application of the Unit

Application of the Unit **2)**

This unit is intended to augment formally acquired competencies. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice **3)**

The skills and knowledge described in this unit do not require a licence to practise in the workplace. However, practice in this unit is subject to regulations directly related to Occupational Health and Safety.

Pre-Requisites

Prerequisite Unit(s) **4)**

Competencies **4.1)**

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

Where pre-requisite pathways have been identified. All competencies in the Common Unit Group must be have been completed.

There are no prerequisite units

Literacy and numeracy skills **4.2)**

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following levels. A description of what each level entails is provided in Section 2.3.1 Language, Literacy and Numeracy.

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills **5)**

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 Plan and prepare work	1.1	Safety issues are identified to comply with enterprise/site requirements
	1.2	Work, plant and type of start requirements are identified from relevant personnel and documentation
	1.3	The turbine running-up and loading schedule are ascertained from relevant documentation and in accordance with enterprise/site requirements
	1.4	Localised plant inspection, pre operational tests and field preparation for service are carried out in accordance with manufacturer and enterprise/site procedures
	1.5	Plant operational prerequisites are established in accordance with manufacturer and enterprise/site procedures
	1.6	Sequence for recommissioning of plant is determined to suit existing circumstances in accordance with enterprise/site requirements
2 Operate plant	2.1	Output is adjusted to achieve required generator/alternator operating requirements and demand, observing operational requirements
	2.2	Plant is operated within limits of plant design, regulators requirements, enterprise or site requirements
	2.3	Plant is monitored and observed to detect deviations from required operating conditions

ELEMENT	PERFORMANCE CRITERIA	
	2.4	Corrective actions are taken to rectify abnormalities in accordance with manufacturer and enterprise/site procedures
3 Test plant operation	3.1	Tests are performed in accordance with defined procedures applicable to the operational test
	3.2	System and plant is observed for correct operational response
	3.3	Correct action is taken when response is not in accordance with documentation, plant integrity or personnel safety requirements
	3.4	Plant is returned to required operational status upon completion of test
4 Analyse plant faults	4.1	Cause of abnormal plant operating conditions are identified by analysing the technical and operational information in a logical and sequential manner
	4.2	Actions necessary to rectify fault are correctly determined
	4.3	Plant integrity and personnel safety is maintained through consultation with appropriate personnel, and reference to plant, technical and operational documentation
5 Monitor and inspect plant	5.1	Plant to be monitored/inspected is physically identified
	5.2	Plant is monitored/inspected for normal operation or to detect deviations
	5.3	Corrective action taken is in accordance with enterprise procedures
	5.4	Appropriate personnel are notified when defects are detected
6 Complete documentation	6.1	Documentation is updated and plant problems, movements, abnormalities and status are reported and logged in accordance with enterprise/site procedures

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 operating a generator/alternator.

The extent of the Essential Knowledge and Associated Skills required follows:

KS01-PO362A Generator/Alternator

Evidence shall show that knowledge has been acquired for safe working practices of:

T1 Safety legislation and regulations

T2 Enterprise procedures

T3 Plant drawings and manufacturers manuals

T4 Introduction to and typical arrangements of power production plant

T5 Relevant plant and equipment, its location and operating parameters

T6 Electric motor types and characteristics

T7 Generator/alternator excitation systems types and characteristics

T8 Generator/alternator cooling systems types and characteristics

T9 Automatic voltage regulators types and characteristics

T10 Pump and compressor types and characteristics

T11 Switchgear types and characteristics

T12 Electrical protection types and characteristics

T13 Control and data acquisition systems

T14 Generator/alternator types and characteristics

T15 Generator performance characteristics

T16 Electrical fundamentals

T17 Generator/alternator theory of operation

T18 Heat exchanger types and characteristics

T19 lubrication systems and oil conditioning systems types and characteristics

KS02-PO362A Generator/Alternator

Specific skills needed to achieve the Performance Criteria:

T1 Interpret plant drawings and manufacturers manuals

T2 Apply relevant state and territory regulations

T3 Apply enterprise recording procedures

REQUIRED SKILLS AND KNOWLEDGE

T4 Identify plant status

T5 Prepare plant/equipment for operation

T6 Organise resources

T7 Apply diagnostic and testing techniques

T8 Identify and respond to abnormal plant operating conditions

T9 Plan and prioritise work

T10 Use relevant hand tools

T11 Communicate effectively

T12 Apply data analysis techniques and tools

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the unit of competency and must be read in conjunction with the Performance Criteria and the Range Statement of the unit and the Training Package Assessment Guidelines.

The Evidence Guide forms an integral part of this Competency Standard Unit and shall be used in conjunction with all components parts of this unit and, performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment **9.1)**

Longitude 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 accord with Industry and, Regulatory policy in this regard.

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. Hence, sources of evidence need to be 'rich' in nature so as 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 – UEP12". 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 6) Essential

Knowledge and Associated Skills of this unit

- employability skillsConduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures

- Demonstrated performance across a representative range of contexts from the prescribed items below:
  - Knowledge and application of relevant sections of: Occupational Health and Safety legislation; Statutory legislation; Enterprise/site safety procedures; Enterprise/site emergency procedures
  - Preparation and planning of work
  - Operation of generator/alternator unit
  - Operationally testing plant
  - Analysing plant faults
  - Monitoring plant operation
  - Dealing with an unplanned event 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.

Competency Standards should be assessed in the workplace or simulated workplace and under the normal range of workplace conditions.

Assessment of this unit will be supported with documentary evidence, by means of endorsement stating type and application of work.

In addition to the resources listed above in Context of assessment', evidence should show competency working, in limited spaces, with different types of plant and equipment as well as different structural/construction types and methods and in a variety of environments.

Method of assessment **9.4)**

This unit shall be assessed by methods given in Section 1.3.00 Assessment Guidelines..

Note: Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed 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)**

There are no recommended concurrent assessments with this unit, however in some cases efficiencies may be gained in terms of learning and assessment effort being concurrently managed with allied competency standard units where listed.

Nil

Range Statement

RANGE STATEMENT

10) This relates to the unit of competency 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.

Generator/alternator plant and equipment may include cooling water systems; lubrication systems; excitation systems; automatic voltage regulators, control system; supervisory, alarm and control equipment; electrical motors, fans and pumps; electrical supply and distribution systems; fire protection equipment; heat exchangers, filters and strainers; transformers; water drainage systems; and environmental protective systems.

Prime movers may include steam turbine; gas turbine; hydro turbine; wind turbine and reciprocating engine.

Safety standards may include relevant sections of Occupational Health and Safety legislation, enterprise safety rules, relevant state and federal legislation, national standards for plant and Australian standards and enterprise safety procedures and practices.

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; dedicated computer equipment; enterprise/site standing and operating instructions; enterprise log books; manufacturer operation and maintenance manuals; and equipment and alarm manuals.

Technical and operational indicators may include stimuli (audio, smell, touch, visual), remote or local indicators and recorders, computers and alarms (visible and or audible).Tests may include HV relay tests, Control system operation tests, Rotor earth tests, Oil quality test and Cooling system tests

Communications may be by means of telephone, two way radio, pager, computer (electronic mail) and operating logs (written or verbal).

Appropriate personnel to consult, give or receive direction may include, supervisor/team leader , Network regulator, engineering officer, maintenance office or equivalent, technical and officers, contractor staff, maintenance staff,

Test, fault finding and operating tools may include low and high voltage testers, proving dead equipment, powered or non-powered hand tools.

Operating environment may be remote from plant, aided by indicators and monitors, during inclement or otherwise harsh weather conditions, in wet/noisy/dusty/hot areas, during night periods or locally aided by visual and audible indicators.

Generic terms are used throughout this Training Package for vocational standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms are given in Section 2.1 Preliminary Information and Glossaries.

Unit Sector(s)

Not applicable.

Competency Field

Competency Field **11)**

Operations.