



Australian Government

Department of Education, Employment and Workplace Relations

UEPOPS515B Coordinate power generation

Release: 1

UEPOPS515B Coordinate power generation

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit deals with the skills and knowledge required to coordinate operation and control of multiple generators sharing load under the control of one operator.

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 and where applicable contracts of training such as apprenticeships and the like.

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 pre-requisite 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 5 Writing 5 Numeracy 5

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 for plant operation	1.1 Safety issues are identified to comply with enterprise/site requirements
	1.2 Work, plant and resource requirements are identified from relevant information and documentation
	1.3 Pre operational checks are carried out in accordance with enterprise and site requirements
	1.4 Where appropriate, the teams and individuals roles and responsibilities within the team are identified and, where required, assist in the provision of the on-the-job training
2 Operate generator and excitation system	2.1 System is operated in accordance with enterprise/site and manufacturer's operating procedures
	2.2 Synchronising requirements are assessed, evaluated and achieved to ensure machine/system stability during synchronising
	2.3 System is monitored and observed to detect deviations from normal operating conditions
	2.4 Corrective actions are taken to rectify abnormalities in accordance with manufacturer's and enterprise/site procedures
3 Control generation of electrical energy	3.1 Generator output is adjusted to meet demand whilst observing operating requirements
	3.2 Reactive power generation and voltage regulation requirements are assessed and the system is controlled to achieve the desired output
	3.3 Generator stabilities and operating limits are assessed and the system is controlled to maintain those limits in accordance with enterprise/site and manufacturer's procedures
	3.4 Generator cooling systems and limits are monitored and assessed and excitation system is controlled to maintain those limits in accordance

ELEMENT	PERFORMANCE CRITERIA
4 Coordinate generation control	<p>with enterprise/site and manufacturer's procedures</p> <p>4.1 Load sharing between multiple generators is controlled to maintain optimum efficiency and plant reliability</p> <p>4.2 Output of generators is adjusted to meet demand whilst observing operating requirements</p> <p>4.3 System/plant key indicators are monitored and adjusted to maintain within limits and detect deviations from normal operating conditions</p> <p>4.4 Corrective actions taken to rectify system abnormalities are in accordance with manufacturer's, enterprise/site requirements</p> <p>4.5 System integrity, personal safety and continuity of supply are maintained throughout.</p> <p>4.6 Consultation with appropriate personnel is undertaken as required in accordance with enterprise/ site requirements.</p> <p>4.7 Systems are operated at optimum efficiency</p>
5 Monitor system/plant	<p>5.1 System/plant to be monitored is physically identified</p> <p>5.2 System/plant is monitored for normal operation or to detect deviations</p> <p>5.3 Corrective action taken is in accordance with enterprise/site procedures</p> <p>5.4 Appropriate personnel are notified when defects and abnormal operating conditions are detected</p>
6 Analyse system/plant faults	<p>6.1 Causes of abnormal system operating conditions are identified by analysing the technical and operational information in a logical and sequential manner</p> <p>6.2 Actions necessary to rectify fault are correctly determined</p> <p>6.3 System/plant integrity and personnel safety are</p>

ELEMENT**PERFORMANCE CRITERIA**

		maintained through consultation with appropriate personnel, and reference to plant, technical and operational documentation
	6.4	Appropriate personnel are arranged for local investigation of identified operational abnormalities
7	Complete documentation	7.1 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 co-ordinating power generation.

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

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

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T1 Evidence shall show that knowledge has been acquired for safe working practices of:

- Relevant environmental, occupational health and safety legislation and regulations
- Enterprise procedures
- Plant drawings and manufacturers manuals
- Introduction to and typical arrangements of power production plant
- Relevant plant and equipment, its location and operating parameters
- Relevant state and territory regulations
- Electric motor types and characteristics
- Switchgear types and characteristics
- Electrical protection types and characteristics
- Electrical principles
- Process control principles
- Plant process control systems
- a.c. generators types and characteristics
- Transformers types and characteristics
- Generator excitation and cooling systems, types and characteristics types and characteristics
- Plant status
- Enterprise recording procedures
- Systems components and interactions

T2 Specific skills needed to achieve the performance criteria:

- Interpret plant drawings and manufacturers manuals
- Apply relevant state and territory regulations
- Apply enterprise recording procedures
- Identify plant status;
- Prepare plant/equipment for operation
- Communicate effectively
- Coordinate the operation of plant and equipment
- Maintain generator unit integrity

REQUIRED SKILLS AND KNOWLEDGE

- Apply principles of electrical generation
- Apply data analysis techniques and tools
- Recognise abnormal plant operating conditions
- Apply or determine appropriate corrective actions required
- Plan and prioritise work
- Coordinate the operation of equipment to maintain plant integrity, personnel safety and continuity of supply
- Coordinate the operation of equipment to maintain optimum efficiency
- Interpret remote indication of plant status and condition

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the competency standard unit and must be read in conjunction with the Performance Criteria and the range statement of the competency standard 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.

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 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 pre-requisites 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) of this unit
 - Demonstrate an appropriate level of employability skills
 - Conduct work observing the relevant Anti Discrimination legislation, regulations, policies 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
- Planning and preparing for one operator isolated plant operations
- Operating generator and excitation systems
- Controlling and coordinate generation of electrical energy
- Analysing system faults
- 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 competency standard 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 competency standard 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.

Key indicators may include frequency time error, bus voltage, machine/ equipment voltage and current limits, plant temperatures, reactive power flows, power factor, generation plant load capabilities, protection settings, visual and audible indicators, analogue and digital displays and load shedding requirements.

Systems, plant and equipment may include generator cooling systems; fuel delivery system; generator and generator auxiliary plant; generator excitation system; generation fire protection system; unit coordinated control system; generator circuit breaker/transformer; unit auxiliary switchboards; electricity market auto loading procedures prime mover governing system.

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

Information and documentation sources may include verbal or written communications; enterprise safety rules documentation; enterprise operating instructions; equipment and alarm manuals; dedicated computer equipment; enterprise standing instructions and plant notes; enterprise log books; market load profile forecasts; electricity market bidding information; and manufacturer's operation and maintenance 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).

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

Appropriate personnel for consultation, to give or receive direction may include supervisor/team leader or equivalent; other coordinators of energy production; other operating staff; technical and engineering officers or equivalent; maintenance personnel; and contractor staff.

Operating within an isolated system the environment may be remote from plant and equipment being operated; (operation is assisted by remote indicators of plant status and other parameters monitored); during night periods; during inclement or otherwise harsh weather conditions; and in wet/noisy/dusty areas.

Unit operations (systems requirements) may include spurious faults in automatic systems operating out of range, failure of automatic system components and routine plant movement.

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.