Australian Government

Department of Education, Employment and Workplace Relations

UEPOPS443A Coordinate Wind Farm Operations

Release: 1

UEPOPS443A Coordinate Wind Farm Operations

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit deals with the skills and knowledge required to coordinate the safe and effective management of energy production of a wind farm.

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 4 Writing 4 Numeracy 4

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.
2 Monitor wind farm operations.	2.1 Wind turbines and equipment is monitored for normal operation in accordance with enterprise procedures.
	2.2 Alarms are acknowledged, prioritised and responded to in accordance with enterprise procedures.
	2.3 Deviations from normal operation are identified and corrective action taken is in accordance with enterprise procedures.
	2.4 Plant and equipment trends are created to monitor key areas or problems in accordance with enterprise procedures.
	2.5 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
3 Control wind farm electrical energy production.	3.1 Wind farm energy output is controlled to meet the operational/load requirements of the enterprise and clients.
	3.2 Wind turbines are manually adjusted for operation requirements in accordance with enterprise/site and manufacturer’s procedures.
	3.3 Wind turbines are taken out of service and shut down for operational and maintenance requirements in accordance with enterprise/site and manufacturer’s procedures.

ELEMENT		PERFORMANCE CRITERIA	
		3.4	Wind turbines are run-up and placed into service for operational requirements in accordance with enterprise/site and manufacturer's procedures.
		3.5	Appropriate personnel are notified when defects and abnormal operating conditions are detected.
4	Test wind farm operation.	4.1	Tests are performed in accordance with defined procedures applicable to the operational test.
		4.2	System/plant is observed for correct operational response.
		4.3	Corrective action is taken when response is not in accordance with documentation, plant/system integrity or personnel safety requirements.
		4.4	System/plant is returned to required operational status upon completion of test.
5	Analyse system/plant faults.	5.1	Causes of abnormal system operating conditions are identified by analysing the technical and operational information in a logical and sequential manner.
		5.2	Actions necessary to rectify fault are correctly determined.
		5.3	System/plant integrity and personnel safety are maintained through consultation with appropriate personnel, and reference to plant, technical and operational documentation.
		5.4	Appropriate personnel are arranged for local investigation of identified operational abnormalities.
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 co-ordinating wind farm electrical energy production.
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.
- Wind farm principles.
- Wind turbine types and characteristics.
- Wind turbine support systems.
- Wind turbine generator, types and characteristics.
- Wind farm control systems types and characteristics.
- Generator control systems.
- Electric motor types and characteristics.
- Switchgear types and characteristics.
- Electrical protection types and characteristics.
- Electrical principles.
- Process control principles.
- Transformers types and characteristics.
- Generator excitation and cooling systems, types and characteristics.
- Enterprise recording procedures.
- Control and data acquisition systems.
- Supervisory, alarm, protection and control equipment.
- The systems components and interactions.
- High voltage electrical systems.

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.

REQUIRED SKILLS AND KNOWLEDGE

- Organise resources.
- Coordinate electrical energy generation.
- Apply diagnostic and testing techniques.
- Identify and respond to abnormal plant operating conditions.
- Plan and prioritise work.
- Use relevant hand tools.
- Communicate effectively.
- Apply data analysis techniques and tools.
- Coordinate the operation of interacting systems.
- Coordinate the operation of plant and equipment.
- Apply principles of electrical generation.

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 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 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 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
  - Conduct work observing the relevant Anti-Discrimination legislation, regulations, polices and workplace procedure

- Demonstrated performance across a representative range of contexts from the prescribed items below:
  - The preparation and planning of work
  - The operation of generator and excitation systems
  - Coordination of unit operations
  - Analysing plant faults
  - Monitoring plant operation
  - Controlling system energy generation
  - The knowledge of generator and system stability principles

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 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.
Wind farm plant and equipment may include: wind turbines, generator cooling systems, generator excitation systems, generator auxiliary plant, generation fire protection system, wind turbine control system, generator circuit breaker, transformer, switchboards, electricity market auto loading systems, supervisory and control equipment, HV protection equipment and circuit breakers.
Safety standards may include relevant sections of Occupational Health and Safety legislation, enterprise safety rules, 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, d.c.S alarms.
Communications may be by means of telephone, two way radio, pager, computer (electronic mail) and operating logs (written or verbal).
Tests may include: supply change-over tests, "black" start tests and capability tests.
Appropriate personnel to consult, give or receive direction may include supervisor/team leader or equivalent; other coordinators of energy production; technical and engineering officers or equivalent; maintenance personnel; and contractor staff.
Operating environment may be remote from plant and equipment being operated, where 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.
Wind farm operations (systems requirements) may include normal generating models and system auto frequency control mode.
Faults and abnormal operating conditions may include unit trip, market distribution network disturbances, loss of station a.c. supplies, generator excitation/transformer, circuit breaker faults/malfunctions and wind turbine control malfunctions.
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