



Australian Government

Department of Education, Employment and Workplace Relations

UEENEEG046B Develop engineering solutions for energy supply system protection problems

Release: 1

UEENEEG046B Develop engineering solutions for energy supply system protection problems

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor

1)

1.1) Descriptor

This unit covers developing engineering solutions to resolve problems with energy supply system protection. It encompasses working safely, apply extensive knowledge of energy supply system protection operation, protection devices and their application, gathering and analysing data, applying problem solving techniques, developing and documenting solutions and alternatives.

Note.

Typical protection problems are those encountered in meeting performance requirements and compliance standards, revising a protection operating parameters and dealing with protection malfunctions..

Application of the Unit

Application of the Unit 4)

This unit applies to any recognised development program that leads to the acquisition of a formal award at AQF level 4 or higher.

Licensing/Regulatory Information

1.2) License to practice

The skills and knowledge described in this unit require a license to practice in the workplace for work involving direct access to plant and equipment connected to installation wiring at voltage above 50 V a.c. or 120 V d.c. However other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the 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.

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 apparatus 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) 2)

2.1) Competencies

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

UEENEEG038B Diagnose and rectify faults in electrical energy distribution systems

OR

UEENEEG039B Diagnose and rectify faults in distributed generation systems

OR

UEENEEG042B Diagnose and rectify faults in electrical energy supply transmission systems

AND

UEENEEG049B Solve problems in complex polyphase power circuits

For the full prerequisite chain details for this unit please

Prerequisite Unit(s) 2)
refer to Table 2 in Volume 1, Part 2

Employability Skills Information

Employability Skills 3)
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 unit of competency 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 develop engineering solution for energy supply system protection problems.	1.1 OHS processes and 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 The extent of the protection problem is determined from performance specifications and situation reports and in consultations with relevant persons. 1.4 Activities are planned to meet scheduled timelines in consultation with others involved in the work.

ELEMENT	PERFORMANCE CRITERIA
	1.5 Effective strategies are formed to ensure solution development and implementation is carried out efficiently.
2 Develop engineering solution for energy supply system protection.	2.1 OHS risk control measures and procedures for carrying out the work are followed.
	2.2 Knowledge of supply system protection arrangements, operation, device characteristics and applications are applied to developing solutions to supply system protection problems.
	2.3 Parameters, specifications and performance requirements in relation to each protection problem are obtained in accordance with established procedures.
	2.4 Approaches to resolving supply system protection problems are analysed to provide most effective solutions.
	2.5 Unplanned events are dealt with safely and effectively consistent with regulatory requirements and enterprise policy.
	2.6 Quality of work is monitored against personal performance agreement and/or established organizational or professional standards.
3 Test, document and implement engineering solution for energy supply system protection problems.	3.1 Solutions to protection problems are tested to determine their effectiveness and modified where necessary.
	3.2 Adopted solutions are documented including instruction for their implementation that incorporates risk control measure to be followed.
	3.3 Appropriately competent and qualified person(s) required to implement solutions to supply system protection problems are coordinated in accordance with regulatory requirements and enterprise policy. (Note)
	3.4 Justification for solutions used to solve supply

ELEMENT

PERFORMANCE CRITERIA

system protection problems is documented for inclusion in work/project development records in accordance with professional standards.

Note:

A license to practice in the workplace is required for work involving direct access to plant and equipment connected to installation wiring at voltages above 50 V a.c. or 120 V d.c.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) 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 developing engineering solutions for energy supply system protection problems.

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 (EKAS) required is given in Volume 2 - Part 2.2 EKAS. It forms an integral part of this unit.

2.6.22.5 Electrical power system protection diagnostic

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.

EVIDENCE GUIDE

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 - UEE07'. 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:
 - Develop engineering solutions for energy supply system protection problems as described in 8) and including:
 - A Understanding the extent of the protection problem.
 - B Forming effective strategies for solution development and implementation.
 - C Obtaining protection parameters, specifications and performance requirements appropriate to each problem.

EVIDENCE GUIDE

- D Testing and solutions to protection problems.
- E Documenting instruction for implementation of solutions that incorporate risk control measure to be followed.
- F Documenting justification of solutions implemented in accordance with professional standards.
- G 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 developing engineering solutions for energy supply system protection problems.

EVIDENCE GUIDE

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:

UEENEEG038B Diagnose and rectify faults in electrical energy distribution system
OR

UEENEEG039B Diagnose and rectify faults in distributed generation systems
OR

UEENEEG042B Diagnose and rectify faults in electrical energy supply transmission system
OR

UEENEEG049B Solve problems in complex polyphase power circuits

The critical aspects of occupational health and safety covered in unit UEENEEE001B and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

8) 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 developing engineering solution for at least four supply system protection problems.

Note.

Typical protection problems are those encountered in meeting performance requirements and compliance standards, revising a protection operating parameters and dealing with protection malfunctions.

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

2.2) Literacy and numeracy skills

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
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Custom Content Section

Competency Field 5)

Electrical

