



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **UEENEEG007B Select and arrange equipment for general electrical installations**

Release: 1

## **UEENEEG007B Select and arrange equipment for general electrical installations**

### **Modification History**

Not Applicable

### **Unit Descriptor**

#### **Unit Descriptor**

**1)**

##### **1.1) Descriptor**

This unit covers selecting equipment for electrical installations operating at voltages up to 1,000V a.c. or 1,500 V d.c. to meet performance standards. These encompass schemes for protection of persons and property, correct function, compatibility with the supply, arrangement of circuits and selection of switchgear, controlgear, protection devices and wiring based on calculated and deemed-to-comply solutions.

### **Application of the Unit**

#### **Application of the Unit** 4)

This unit is intended as an additional competency to relevant competencies previously acquired and is therefore not applicable to those entering work.

## Licensing/Regulatory Information

### 1.2) License to practice

The skills and knowledge described in this unit do not require a license to practice in the work place. However practice in this unit is subject to regulations directly related to occupational health and safe and contracts of training such as new apprenticeships.

## 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.

UEENEEG002B Solve problems in single and three phase low voltage circuits

For the full prerequisite chain details for this unit please 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 select equipment.	1.1	The extent and nature of the electrical installation is determined from job specifications.
		1.2	Safety and other regulatory requirements to which the electrical installation shall comply are identified, obtained and understood.
2	Arrange installation into circuits.	2.1	Circuits are arranged to ensure safe and functional operation of the installation.
		2.2	Circuits are arranged to comply with technical standards and job specifications and requirements.
		2.3	Earthing is arranged to comply with the MEN system requirements.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b>
3 Select cables, protection and switchgear.	3.1 Wiring is selected for suitability for the environments in which they are installed.
	3.2 Cable conductor sizes are selected to meet current-carrying capacity requirements and voltage-drop and fault-loop impedance limitations.
	3.3 Protection methods and devices are selected to meet co-ordination requirements for overload and short-circuit protection.
	3.4 Switchgear and control gear is selected to meet current, voltage and IP ratings and functional requirements.
	3.5 Earthing system components are selected to meet requirements of the MEN system.
	3.6 Evidence is obtained that electrical equipment selected complies with safety requirements.
4 Document electrical installation.	4.1 Reasons for selections made, including calculations, are documented in accordance with established procedures.
	4.2 Electrical installation arrangement and specifications for all selected items are documented in accordance with established procedures and forwarded to appropriate person(s).

## 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 selecting and arranging equipment for general electrical installations.

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.

- 2.1.1 Cable protection and support
- 2.1.2 Cable types and applications
- 2.1.3 Cables in buildings, structures and premises
- 2.2.1 Enterprise communication methods
- 2.2.2 Enterprise work activities records
- 2.3.1 Electrical control devices
- 2.5.1.2 Drawings and diagrams
- 2.5.2.1 Technical standards, regulations and codes for electrical installations
- 2.5.10 Technical manuals and catalogues
- 2.5.11 Environmental and heritage awareness
- 2.6.1 Protection devices and applications
- 2.6.2.1 Switchboards/distribution boards
- 2.7.1.2 Electrical installations, wiring and accessories
- 2.7.1.3 Electrical wiring systems
- 2.7.2 Electrical installations, equipment requirements
- 2.7.3 Electrical installations, safety principles and

## **REQUIRED SKILLS AND KNOWLEDGE**

requirements

- 2.7.4.1 Electrical installations, protection methods and devices
- 2.7.4.2 Electrical installations, circuit arrangements and cable selection
- 2.11.3.1 Fixing and support devices and techniques

## 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:
  - Select and arrange equipment for general electrical installations as described as described in 8) and including:
    - A Arranging electrical installations to comply with safety and other regulatory and functional requirements.
    - B Selecting appropriate type and size of cables.
    - C Selecting protection methods and devices that meet co-ordination requirements for overload and

## EVIDENCE GUIDE

short-circuit protection.

- D Selecting switchgear and control gear that meet current, voltage and IP ratings and functional requirements.
- E Selecting appropriate earthing components.
- F Documenting installation arrangement, specification for items selected and reasons for the selections made.
- 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.

### 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 selecting and arranging equipment for general electrical installations.

## 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:

UEENEE001B Use basic computer applications relevant to a workplace

The critical aspects of occupational health and safety covered in unit UEENEE001B 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 selecting and arranging equipment for at least two general electrical installations comprising a main switchboard, at least supplying lighting, one circuit supplying socket outlets, one circuit supplying a fixed appliance. One of the installations shall include a distribution board additional to the main switchboard and a circuit supplying a three-phase load.

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	4	Writing	4	Numeracy	4
---------	---	---------	---	----------	---

## Custom Content Section

Competency Field 5)

Electrical