



Australian Government

UEENEEK105A Conduct periodic maintenance of remote area power supply photo voltaic arrays

Release: 2

UEENEEK105A Conduct periodic maintenance of remote area power supply photo voltaic arrays

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

1) Scope:

1.1) Descriptor

This unit covers maintenance of remote area power supply (RAPS) photo voltaic arrays where the exposed voltage is not greater than 50 V a.c. or 120 V d.c. It encompasses working safely and to maintenance standards and following maintenance routines, identifying known types of photo voltaic array faults using routine procedures and completing the necessary maintenance reporting.

Application of the Unit

Application of the Unit 2)

This unit is intended primarily for indigenous persons seeking qualifications in RAPS system servicing. The unit may also be applied to work entry qualifications in renewable energy service work in general and be used in school-based vocational programs.

Licensing/Regulatory Information

License to practice 3)

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

Pre-Requisites

Prerequisite Unit(s) 4)

Competencies 4.1)

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

- | | |
|-----------------|--|
| UEENEEE1
01A | Apply Occupational Health Safety regulations, codes and practices in the workplace |
| UEENEEE1
02A | Fabricate, dismantle, assemble of utilities industry components |
| UEENEEK1
01A | Maintain safety and tidiness of remote area power supply systems |
| UEENEEE1
07A | Use drawings, diagrams, schedules, standards, codes and specifications |
| UEENEEK1
02A | Work safely with remote area power supply systems |
| UEENEEE1
31A | Solve problems in ELV circuits for non electrical workers |
| OR | |
| UEENEEE1
04A | Solve problems in d.c. circuits |

Literacy and numeracy skills 4.2)

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	3	Writing	3	Numeracy	3
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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 Prepare to conduct periodic maintenance on photo voltaic arrays	1.1 OHS procedures for a RAPS plant are identified, obtained and understood through established routines and procedures. 1.2 Established OHS risk control measures and procedures in preparation for the work are followed. 1.3 Safety hazards which have not previously been identified are reported and advice on risk control measures is sought from the work supervisor. 1.4 The nature and location of RAPS system is identified from documentation or from work supervisor to establish the scope of work to be undertaken. 1.5 Advice is sought from the work supervisor to ensure the work is coordinated effectively with

ELEMENT	PERFORMANCE CRITERIA
	fellow workers and the local community.
	1.6 Sources of materials that may be required for the work are identified and accessed in accordance with established routines and procedures.
	1.7 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.
2 Maintain RAPS systems photo voltaic arrays	2.1 Established OHS risk control measures and procedures for carrying out the work are followed.
	2.2 The need to test or measure live is determined in strict accordance with OHS requirements and when necessary conducted within established safety procedures.
	2.3 Circuits/machines/plant are checked as being isolated where necessary in strict accordance OHS requirements and procedures.
	2.4 Prescribed maintenance procedures are used to test and check RAPS system photo voltaic arrays.
	2.5 Photo voltaic array maintenance, including performance measurements and repairs are carried out safely and to prescribed routines and procedures.
	2.6 Known types of photo voltaic array functional faults are identified using routine fault finding procedures.
	2.7 Procedures are followed for referring non-routine events to immediate supervisor for directions.
	2.8 Maintenance and repair work is carried out efficiently without waste of materials and energy and without damage to apparatus, circuits, the surrounding environment or services
	2.9 Routine quality checks are carried out in accordance with work instructions.

ELEMENT	PERFORMANCE CRITERIA
3 Complete maintenance work of photo voltaic arrays and report	3.1 OHS work completion risk control measures and procedures are followed.
	3.2 Work site is cleaned and made safe in accordance with routine procedures.
	3.3 Procedures for referring local maintenance issues to the community are followed.
	3.4 Photo voltaic array performance measurements are reported to the work supervisor through the established maintenance reporting 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 must show that knowledge has been acquired of safe working practices and conducting periodic maintenance of remote area power supply (RAPS) photo voltaic arrays sets.

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

KS01-EK105A RAPS systems photovoltaic array maintenance techniques

Evidence shall show an understanding of maintaining remote area power supply (RAPS) photovoltaic arrays to an extent indicated by the following aspects:

T1 RAPS systems photovoltaic array maintenance techniques encompassing:

- Cleaning of photo voltaic modules
- Checking for damage or de-lamination
- Checking of module connections, connecting cable and integrity of the array structure
- Maintaining log books and maintenance regime

Evidence Guide

EVIDENCE GUIDE

9) This provides essential advice for assessment of the 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 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-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. 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 issues inherent in working with electricity, electrical equipment, gas or any other hazardous substance/material present a challenge for those determining competence. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday 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 must be met.

Evidence for competence in this unit must be considered holistically. Each element and associated performance criteria must be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence must 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 must 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, policies & workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Conduct periodic maintenance of remote area power supply (RAPS) photo voltaic arrays as described in 8) and including:

A Measuring and recording array no-load and load voltages together with ambient temperature

B Measuring and recording array output for three

load conditions

- C Visually inspecting array modules and support structure for physical damage
- D Visually inspecting array connections and cables
- E Identifying array defects and faults
- F Reporting all maintenance activities
- G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a 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 conducting periodic maintenance of remote area power supply (RAPS) photo voltaic arrays.

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 intended primarily 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:

UEENEEK10 3A Conduct periodic maintenance of remote area power supply battery banks

UEENEEK10 4A Conduct periodic maintenance of remote area power supply generator sets

UEENEEK10 6A Conduct periodic maintenance of remote area power supply wind generators

The critical aspects of occupational health and safety covered in unit UEENEEE101A and other discipline specific occupational health and safety units shall be incorporated in relation to this unit.

Range Statement

RANGE STATEMENT

10) 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 must be demonstrated in relation to least two different RAPS systems in which the photo voltaic array is charged from a photo voltaic array and a photo voltaic array and at least one similar RAPS system where the photo voltaic array is charged from a wind generator.

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

Competency Field **11)**

Renewable and Sustainable Energy