

# **UEERE9988Y Fault find and repair off-grid photovoltaic/generating set systems to an electrical installation**

## **Modification History**

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

## **Application**

This unit involves the skills and knowledge required to fault find and repair off-grid photovoltaic (PV)/generating set (genset) systems to an electrical installation.

It includes preparing to work on off grid systems, solving problems in off grid systems and completing work and documenting problem-solving activities.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating current (a.c.) or 120 V direct current (d.c).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, a relevant contract of training, such as an Australian Apprenticeship, is required.

Additional and/or 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 work health and safety (WHS)/occupational health and safety (OHS) regulations.

## **Pre-requisite Unit**

UEERE9991Y Conduct site survey for off-grid photovoltaic/generating set systems

UEEEL0039 Design, install and verify compliance and functionality of general electrical installations

## **Competency Field**

Renewable Energy

## **Unit Sector**

Electrotechnology

## Elements and Performance Criteria

### ELEMENTS

Elements describe the essential outcomes.

### PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

#### **1 Prepare to fault find and repair off-grid PV/genset systems**

- 1.1** Work health and safety (WHS)/occupational health and safety (OHS) processes and procedures for relevant work area are identified and applied in accordance with workplace procedures
- 1.2** The nature of the fault/issue is identified from stakeholders and relevant data and documentation
- 1.3** Requirements for working with other stakeholders are confirmed and applied
- 1.4** Required materials, tools, apparatus and testing devices are identified, accessed and checked for correct operation and safety
- 1.5** Need to test or measure live electrical work is determined in accordance with WHS/OHS requirements and workplace procedures

#### **2 Fault find and repair off-grid PV/genset systems**

- 2.1** Circuits/apparatus are isolated in accordance with WHS/OHS requirements and workplace procedures
- 2.2** Nature of reported fault/issue is verified
- 2.3** System testing is conducted and documented
- 2.4** Fault or faults are diagnosed, faulty equipment is identified, and the replacement products required are documented
- 2.5** System is made safe, faulty apparatus is dismantled, recorded and stored in accordance with manufacturer guides and stakeholder instructions
- 2.6** Repaired or replaced apparatus is assembled in accordance with manufacturer guidelines, industry standards and regulation

#### **3 Complete and report repair work activities**

- 3.1** Repaired apparatus is tested and commissioned in accordance with manufacturer guidelines, industry standards and regulation

**3.2** Work area is cleaned and made safe

**3.3** Repair is documented and stakeholders notified

## Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

## Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Fault finding and repair of off-grid PV/genset systems must include at least three of the following:

- determining the operating parameters of an existing apparatus/modules
- identifying and locating electrical faults
- determining solar radiation faults and problems
- identifying and locating mechanical fault.

## Unit Mapping Information

This is a new unit.

## Links

UEE - Electrotechnology Training Package Companion Volume Implementation Guide at:  
[sector webpage link here]

# **Assessment Requirements for UEERE9988Y Fault find and repair off-grid PV/genset systems to an electrical installation**

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## **Performance Evidence**

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least two occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) procedures
- finding and repairing faults/issues in off-grid PV/genset systems including:
  - verifying the reported faults/issues
  - diagnosing fault/issue based on measured and expected values
  - determining and implementing solution
  - documenting issue and justification for the solution used.

## **Knowledge Evidence**

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- off-grid PV/genset systems maintenance processes including:
  - correct isolation and shutdown procedures prior to carrying out maintenance tasks
  - appropriate maintenance methods for the various system components using appropriate safety procedures
  - maintenance schedule for the system
  - problem-solving techniques, including measuring and calculating value requirements
- off-grid PV/genset systems fault finding:
  - procedures for individual equipment
  - procedures for interconnected systems
- off-grid PV/genset systems maintenance procedures including:
  - requirements for individual equipment
  - requirements for interconnected systems.

- requirements including relevant industry standards, regulations and manufacturer requirements
- off-grid PV/genset systems testing and commissioning procedures including:
  - safe testing of equipment
  - safe testing of system operation
- system configurations including multiple energy sources including:
  - systems with d.c. loads only
  - systems with d.c. and ac. loads
  - systems with a.c. loads
  - renewable energy only systems including PV, wind and micro-hydro
  - hybrid systems comprising one or more RE system with fuel generator
- electrical installation requirements including:
  - methods used in wiring and connecting the following in accordance with relevant Australian Standards and manufacturers requirements:
    - multiple PCEs and associated control equipment
    - PCEs with generating sets
    - PCEs and fuel generators directly with loads or with switchboards or distributions board
  - selection and locating the associated protection and isolating devices in accordance with relevant Australian standards and industry guidelines
  - wiring diagrams for the off-grid RE system showing the general circuit layout and protection between the various system components
- system control installation including:
  - control and monitoring equipment
  - associated cabling
  - control programming
- system testing and commissioning
- system documentation
- relevant manufacturer specifications
- relevant safe work method statements (SWMS)/job safety assessments or risk mitigation processes.

## Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in suitable simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- resources that reflect current industry practices in relation to fault finding and repair of PV/genset systems
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

## Links

UEE - Electrotechnology Training Package Companion Volume Implementation Guide at:  
[sector webpage link here]