



Australian Government

UEERE0035 Install ELV stand-alone photovoltaic power systems

Release: 1

UEERE0035 Install ELV stand-alone photovoltaic power systems

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 install extra-low voltage (ELV) stand-alone photovoltaic (PV) power systems.

It includes preparing to install ELV stand-alone PV power apparatus and systems, installing ELV stand-alone PV power apparatus and system, completing installation and reporting installation activities.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

UEERE0022 Solve basic problems in photovoltaic energy apparatus and systems

Competency Field

Renewable Energy

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to install ELV stand-alone PV power apparatus and systems

PERFORMANCE CRITERIA

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

- 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** WHS/OHS hazards are identified, risks assessed, reported to relevant person/s and workplace procedures

for risk control measures applied in preparation for work

- 1.3** System installation is planned in consultation with others impacted by the work and sequenced appropriately
- 1.4** Nature and location of the work are determined from documentation or relevant person/s to determine the scope of work
- 1.5** Sitting limitations and customer system requirements are identified through consultation with relevant person/s
- 1.6** Energy demand is assessed and recommendations made to the customer for energy efficiency improvements, as necessary
- 1.7** Suitable system components are specified and selected in accordance with workplace procedures
- 1.8** Location of system components is planned within the constraints of the building structure and regulations
- 1.9** Instructions for coordinating work with others is obtained from relevant person/s and applied
- 1.10** Materials and components required are obtained, pre-assembled, where necessary, and checked against job requirements in accordance with workplace procedures
- 1.11** Materials and components are prepared for transport to the site and transport is arranged in accordance with workplace procedures
- 1.12** Tools, equipment and testing devices required are obtained in accordance with workplace procedures and checked for correct operation and safety
- 1.13** Preparatory work is checked to ensure no unnecessary damage has occurred and complies with requirements

2 Install ELV stand-alone PV power apparatus and systems

- 2.1** Equipment is transported safely to site in accordance with workplace procedures
- 2.2** Need to test or measure live electrical work is determined in accordance with WHS/OHS requirements and conducted in accordance with workplace procedures

- 2.3 Circuits/machines/plant are isolated in accordance with WHS/OHS requirements and workplace procedures
 - 2.4 System components are installed in compliance with technical industry standards, job specifications and requirements, and with sufficient access to enable terminations, adjustment and maintenance
 - 2.5 Wiring is terminated at components and associated equipment in accordance with manufacturer specifications and functional and regulatory requirements
 - 2.6 Unplanned situations are discussed with relevant person/s and responded to in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
 - 2.7 Checks of installed apparatus quality are conducted in accordance with workplace procedures
 - 2.8 System installation is conducted minimising waste of materials, damage to apparatus, circuits, the surrounding environment and services using sustainable energy principles
- 3 **Complete installation and report installation activities**
 - 3.1 Worksite is cleaned and made safe in accordance with workplace procedures
 - 3.2 Final checks are conducted to confirm installed apparatus conforms to requirements
 - 3.3 System operation is tested and installation verified as compliant with standards and work specifications
 - 3.4 'As-installed' apparatus and associated equipment are documented and relevant person/s notified in accordance with workplace procedures
 - 3.5 Customer is informed of system operation, routine maintenance and limitations
 - 3.6 Documentation required by standards or job specifications is provided to the customer

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.

Unit Mapping Information

This unit replaces and is equivalent to UEENEEK134A Install ELV stand-alone photovoltaic power systems.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEERE0035 Install ELV stand-alone photovoltaic power systems

Modification History

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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 and performance criteria on at least one occasion and include:

- assessing customer energy requirements, efficiency improvements and site limitations
- reading and interpreting drawings related to and apparatus locations and circuit connections
- placing and securing system components accurately
- maintaining fire integrity
- connecting system components to comply with requirements
- testing system operation and verifying compliance with standards and job specifications
- completing necessary documentation, including handing over system operational documents to the customer and informing customer of system operation, routine maintenance and limitations
- dealing with unplanned events
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures and practices, including the use of risk control measures
- applying sustainable energy principles and practices
- checking isolation of circuits/machines/systems
- conducting quality checks during installation
- coordinating work with relevant person/s
- determining live electrical testing/measurement requirements
- identifying and accessing materials, tools, equipment and testing devices
- installing and setting up stand-alone extra-low voltage (ELV) photovoltaic (PV) power systems.

Knowledge Evidence

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

- stand-alone ELV PV systems, including:
 - PV array installation requirements encompassing:
 - WHS/OHS requirements and methods for working on roofs

- common methods of roof construction (rafters and tile battens) and methods to ensure integrity of waterproofing
- common types of roof-mounted and free-standing PV array frame construction and methods of tilt angle adjustment
- fixing methods for different roof types
- array mounting methods for north orientation roof sections and non-north facing roof sections
- aesthetic considerations in choosing an appropriate array location and type of mounting
- the mounting and fixing methods for at least one type of domestic available building integrated PV product
- electrical PV array installation requirements encompassing:
 - methods used in wiring and connecting PV arrays in accordance with Australian Standards AS/NZS 4509 Stand-alone power systems and AS 5033 Installation and safety requirements for photovoltaic (PV) arrays
 - considerations involved in wiring of series connected PV modules in order to minimise power losses due to shading
 - PV array wiring diagram, including the placement of blocking and bypass diodes
 - considerations involved in choosing the location of associated system equipment, including regulators and direct current (d.c.) control board
 - cable route from PV array/s to regulators so as to minimise the route length to battery
- system installation and maintenance encompassing:
 - installation work on a PV power system in accordance with relevant standards and WHS/OHS guidelines
 - correct isolation and shutdown procedures prior to carrying out maintenance tasks
 - routine maintenance tasks on PV arrays
 - required vegetation control to remove or reduce shading or soiling on a PV array
- relevant manufacturer specifications
- relevant safe work method statements (SWMS)/job safety assessments or risk mitigation processes
- relevant workplace documentation
- relevant workplace policies and procedures.

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
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

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