

Domain

Title:

Level: 1

SOLAR INSTALLATION
Demonstrate knowledge of solar energy technologies

Unit ID: 1646

Credits: 4

Purpose

This unit standard specifies the competencies required to demonstrate knowledge of solar energy technologies. It includes the following elements: Demonstrate understanding of solar energy; Demonstrate understanding of SHS technologies; Demonstrate understanding of SWH technologies; Demonstrate understanding of PVP technologies. This unit standard is intended for those who work in a solar energy installation environment.

Special Notes

1. Entry information:

Prerequisite:

- *1641: Apply safety rules and regulations in a solar energy installation environment* or demonstrated equivalent knowledge and skills.

2. Assessment evidence may be collected from a real workplace or simulated real workplace or an appropriate simulated realistic environment in which plumbing operations are carried out.

3. Performance of all elements in this unit standard must comply with all relevant workplace requirements or manufacturers' specifications.

4. Glossary of terms:

- 'SHS' refers to Solar Home System
- 'SWH' refers to Solar Water Heating
- 'PV' refers to Photo Voltaic
- 'PVP' refers to Photo Voltaic Pump.

5. Regulations and legislation relevant to this unit standard include the following:

- Labour Amendment Act, 2012 (Act No. 2 of 2012)
 - Occupational Health and Safety Regulations No. 18 of 1997
- and all subsequent amendments to any of the above.

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions, which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority on www.namqa.org and the Namibia Training Authority on www.nta.com.na.

Elements and Performance Criteria

Element 1: Demonstrate understanding of solar energy

Performance criteria

- 1.1 The concept of solar energy is explained.
- 1.2 Domestic applications of solar energy are explained.
- 1.3 Energy efficiency is explained.
- 1.4 Advantages and disadvantages of solar energy use are explained.

Element 2: Demonstrate understanding of SHS technologies

Performance criteria

- 2.1 Solar cell and solar modules are defined.
- 2.2 P-N junction is explained.
- 2.3 Modules' performance is explained.
- 2.4 Electrical quantities of modules are measured
- 2.5 The composition of various types of modules is explained.
- 2.6 Solar energy system components are defined.
- 2.7 The various types of photo-voltaic systems are listed and described.

Element 3: Demonstrate understanding of SWH technologies

Range:

Types of SWH technologies may include direct and indirect systems, passive and active systems, passive direct systems and active indirect systems.

Performance criteria

- 3.1 Heat energy and its movement are defined.
- 3.2 Benefits and risks associated with solar water heating are explained.
- 3.3 Types of solar water heaters are listed and described.
- 3.4 Construction of various types of water heater is explained.
- 3.5 SWH systems components are defined.

3.6 Mechanical and electrical quantities are explained.

Element 4: Demonstrate understanding of PVP technologies

Range:

Different PVP technologies are included, but limited to PV power supply.

Performance criteria

- 4.1. PV power supply to pumps is explained.
- 4.2. Pump components are listed and defined.
- 4.3. Construction of various types of pumps is explained.
- 4.4. Mechanical, electrical quantities and basic hydraulics are explained.

Registration Data

Subfield:	Electrical Engineering
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