

Domain

**POWER PLANT OPERATIONS**

Title:

**Demonstrate knowledge of hydro power plant**

Level: 4

**Credits: 6**

### Purpose

This unit standard is intended for those who demonstrate knowledge of hydro power plant. People credited with this unit standard are able to explain operation principles of hydro generation plant; describe procedures of hydro plant power generation; describe operation of power plant auxiliary equipment; and explain water management principles.

This unit standard is intended for those who work as power station operators.

### Special Notes

1. Entry information:

Prerequisite

- *None*

2. This unit standard is to be delivered and assessed in the context of power plant operations and should be assessed in conjunction with other relevant technical units selected from this domain.

3. To demonstrate competence, at a minimum, evidence is required in demonstrating knowledge of hydro power plant operation.

4. Assessment evidence may be collected from a real workplace or a simulated workplace environment in which power plant operations are carried out.

5. Glossary of terms:

- '*Specifications*' refers to any, or all of the following: manufacturers' specifications and recommendations, workplace specific requirements, national and international standards and legislations
- '*ISO*' refers to International Organization for Standards
- '*SANS*' refers to South African National Standards.

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

- Labour Act No. 11 of 2007
- Petroleum Products and Energy Amendment Act No. 2 of 2005
- National Energy Fund Act of 2000
- Regulations relating to the health & safety of employees at work under Schedule 1 (2) of the Labour Act No.11 of 2007

- ISO 14001 (Environmental Management Standard)
- Electricity Act No.4 of 2007
- SANS 10142-1 and SANS 10142-2 electrical wiring codes 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](http://www.namqa.org) and the Namibia Training Authority on [www.nta.com.na](http://www.nta.com.na).

## **Elements and Performance Criteria**

### **Element 1: Explain operation principles of hydro generation plant**

#### **Performance Criteria**

- 1.1 Generation principles are identified and explained.
- 1.2 Advantages and disadvantages of hydro plant are identified and described.
- 1.3 Components of hydro power plant are identified and operation of each is described.
- 1.4 Hydro turbine features and operations are identified and explained.
- 1.5 Environmental effects of a hydro plant construction and operations are described.

### **Element 2: Describe procedures of hydro plant power generation**

#### **Performance Criteria**

- 2.1 Hydro plant layout and operation procedures are explained.
- 2.2 Procedures of plant start-up are identified and explained.
- 2.3 Procedures of plant shut-down are identified and explained.
- 2.4 Operation of safety equipment and alarms is explained.
- 2.5 Documentation of plant operation is explained.

### **Element 3: Describe operation of power plant auxiliary equipment**

#### **Performance Criteria**

- 3.1 Auxiliary power plant equipment are identified and explained.
- 3.2 Operation principles of auxiliary power plant equipment are explained.

### **Element 4: Explain water management principles**

#### **Performance Criteria**

- 4.1 Dam construction, lay-out and water catchment is described.
- 4.2 Water management principles are identified and described.
- 4.3 Reservoir control principles are described.

### **Registration Data**

<b>Subfield:</b>	Electrical Engineering
<b>Date first registered:</b>	24 July 2014
<b>Date this version registered:</b>	23 November 2023
<b>Anticipated review:</b>	23 November 2028
<b>Body responsible for review:</b>	Namibia Training Authority