Unit ID: 1491

Domain **METALLURGICAL PROCESSING - CORE**
Title: **Control and monitor automated plant and machinery**

Level: 4 **Credits: 12**

Purpose

This unit standard is intended for those who carry out metallurgical processing operations. People holding credit for this unit standard are able to: Demonstrate knowledge of control systems used in metallurgical processing operations; apply control systems used in metallurgical processing operations; control and monitor plant and machinery with control system; fault find and correct control system problems; and complete duties pertaining to the control and monitor of automated plant and machinery.

Special Notes

1. Entry information:

   Prerequisite
   - 1449 - *Comply with health, safety and environmental rules and regulations pertaining to processing operations;* or demonstrated equivalent knowledge and skills.

2. Assessment evidence may be collected from a real workplace or a simulated workplace in which processing operations are carried out.

3. This unit standard may be assessed in a holistic way with other relevant technical unit standards selected from the metallurgical processing, mineral processing, hydrometallurgy, or pyrometallurgy domain.

4. *'Control systems'* may include but are not limited to Supervisory Control And Data Acquisition (SCADA) systems; Distributed Control Systems (DCS); and Programmable Logic Controllers (PLC).

5. Safe working practices include day-to-day observation of safety policies and procedures and compliance with emergency procedures.

6. Specifications refer to any, or all of the following: manufacturer's specifications and recommendations, and workplace specific requirements.

7. Performance of all elements in this unit standard must comply with relevant regulatory, legislative, workplace requirements and/or manufacturers' specifications. Expected worksite targets are to be met.

8. Regulations and legislation, including subsequent amendments, relevant to this unit standard may include but are not limited to the following:
   - Labour Act, No. 11, 2007
   - Mineral Act, No. 33, 1992
   - Mine Health and Safety Regulations, 1999
   - Regulations relating to the Health and Safety of employees at work, 1997

and all industry specific regulations, legislations, code of practice, or code of conduct.

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 and the Namibia Training Authority. All approved unit standards, qualifications and national assessment arrangements are available on the Namibia Training Authority website www.nta.com.na.

Elements and Performance Criteria

Element 1: Demonstrate knowledge of control systems used in metallurgical processing operations

Range

Basic logic includes but is not limited to measuring the variable, comparing it to a setting and adjusting some parameter in an attempt to move the variable closer to the setting.

Modes include automatic; manual; and ratio control.

Fail-safe positions include open; close; and percentage.

Elements include measurement elements; signal transfer elements; actuators responding to signals, alarms, trips, interlocks, and fail-safe.

Performance Criteria

1.1 The principles and basic logic of control systems are explained using simple examples.

1.2 The different control modes used in control systems are explained with examples of practical applications.

1.3 The three different types of control systems are explained: open loop, feed-forward, and feedback.

1.4 The purpose and application of safety devices, alarms, and trips in a control system are described.

1.5 The reason for different fail-safe positions in a control system is explained.

1.6 The elements of a control system are identified.

Element 2: Apply control systems used in metallurgical processing operations

Performance Criteria

2.1 Work instructions, including plans, quality requirements, handling procedures and operational details are obtained, explained, clarified and applied to the allocated task.

2.2 Safety and security requirements, including personal protective clothing, are obtained from the site safety plan, workplace policies and procedures, explained, and applied to the allocated task.

2.3 Environmental protection requirements are identified from the project environmental management plan and applied to the allocated task.

2.4 Communication channels are established and maintained according to workplace procedures.

Element 3: Control and monitor plant and machinery with control system

Performance Criteria

3.1 Monitoring of control system, and control room pre-operation and visual checks, are performed according to workplace procedures.

3.2 Procedures for start-up and log onto control system to operate plant and machinery are established and implemented according to workplace procedures.

3.3 Plant, machinery and personnel safety is monitored through control system according to workplace procedures.

Element 4: Fault find and correct control system problems

Range

Problems may include routine and non-routine, operational and maintenance problems.

Performance Criteria

4.1 Minor deviations of the plant and machinery's normal operating parameters are identified and corrected according to workplace procedures.

4.2 Emergency shutdown procedures are followed, if applicable, according to workplace procedures.

4.3 Abnormal conditions are reported to control room and/or appropriate personnel according to workplace procedures.

4.4 Plant and machinery is isolated and tagged prior to maintenance work according to workplace procedures.

4.5 Routine planned inspections, preventative maintenance are carried out and documented as per maintenance schedule according to workplace procedures.

Element 5: Complete duties pertaining to the control and monitor of automated plant and machinery

Range

Housekeeping may include but is not limited to ensure the work area is ready for next user; remove work materials to designated locations; correctly identify waste and re-usable material; and remove waste and re-usable materials to designated locations.

Performance Criteria

5.1 Task-specific tools, personal protective and safety equipment, are cleaned, maintained and stored for further use according to workplace procedures.

5.2 Good housekeeping practices are maintained according to workplace procedures.

5.3 Reporting and recording requirements are met according to workplace procedures.

5.4 Work related documents are completed according to job requirements and workplace procedures.

Registration Data

Subfield:	Metallurgy
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Body responsible for review:	Namibia Training Authority