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SOUTH AFRICAN QUALIFICATIONS AUTHORITY
REGISTERED QUALIFICATION:

Occupational Certificate: Sugar Processing Controller

SAQA QUAL ID		QUALIFICATION TITLE		
97590		Occupational Certificate: Sugar Processing Controller		
ORIGINATOR				
Development Quality Partner - AgriSETA				
PRIMARY OR DELEGATED QA BODY			NQF SUB-FRAMEWORK	
-			OQSF - Occupational Qualifications Sub-framework	
QUALIFICATION TYPE	FIELD		SUBFIELD	
Occupational Certificate	Field 01 - Agriculture and Nature Conservation		Secondary Agriculture	
ABET BAND	MINIMUM CREDITS	PRE-2009 NQF LEVEL	NQF LEVEL	QUAL CLASS
Undefined	230	Not Applicable	NQF Level 05	Regular-ELOAC
REGISTRATION STATUS		SAQA DECISION NUMBER	REGISTRATION START DATE	REGISTRATION END DATE
Registered		IEXC 0002/16	2016-02-17	2019-02-17
LAST DATE FOR ENROLMENT		LAST DATE FOR ACHIEVEMENT		
2020-02-17		2023-02-17		

In all of the tables in this document, both the pre-2009 NQF Level and the NQF Level is shown. In the text (purpose statements, qualification rules, etc), any references to NQF Levels are to the pre-2009 levels unless specifically stated otherwise.

This qualification does not replace any other qualification and is not replaced by any other qualification.

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

The purpose of this qualification is to prepare a learner to operate as a Sugar Processing Controller. A Sugar Processing Controller achieves production targets and quality standards by monitoring, controlling and responding to operational variables, processing equipment, resource and by ensuring the mechanical integrity of equipment.

A qualified learner will be able to:

- Control sugar processing equipment to achieve planned sugar outputs that meet product specifications.

- Control sugar milling operations and resources to achieve efficiency standards.
- Monitor and enforce compliance with Safety, Health, Environmental Protection and Quality (SHEQ) policies, practices and procedures in a sugar processing plant.
- Monitor and ensure the integrity of operational equipment and facilities for a sugar processing unit.

Rationale:

This qualification responds to the needs of the sugar processing industry for persons controlling the processing operations in a sugar mill or processing plant. The qualification addresses the industry need to provide knowledge and build competency for future training and will address the critical labour market need for broadening the pool of qualified persons in the sugar industry who are tasked with controlling the equipment, processes and standards in the production of sugar.

The qualification supports a progressive pathway for the development of operational staff employed in a sugar processing and refining plant and promotes career opportunities in the sector for persons employed at equipment operator level.

Past training practices for staff employed in related functionaries mainly focused on a range of in-house training programmes offered by individual companies with the support of the Sugar Milling Research Institute and the technical training facility of the South African Sugar Association, the Shukela Training Centre. This qualification recognises past practices that has worked well for the industry over many years, but further enhances these programmes through the establishment of an occupational qualification that formalises and structures practical and experiential learning components.

This qualification provides an opportunity for new entrants, as well as those who have been employed in operator related positions, aspiring for employment in a managerial position in the sugar processing industry.

LEARNING ASSUMED TO BE IN PLACE AND RECOGNITION OF PRIOR LEARNING

Recognition of Prior Learning (RPL):

RPL for access to the external integrated summative assessment: Accredited providers and approved workplaces must apply the internal assessment criteria specified in the related curriculum document to establish and confirm prior learning. Accredited providers and workplaces must confirm prior learning by issuing a statement of result or certifying a work experience record.

RPL for access to the qualification: Accredited providers and approved workplaces may recognise prior learning against the relevant access requirements.

Entry Requirements:

Learners are required to have the following in order to be considered for admission:

- NQF Level 4 qualification with Communication and Mathematical Literacy.

Or

- NCV at NQF Level 4.

RECOGNISE PREVIOUS LEARNING?

Y

QUALIFICATION RULES

This qualification is made up of the following compulsory Knowledge and Practical Skill Modules:

Knowledge Modules:

- 313908000-KM-01, Introduction to sugar processing laboratory work, at NQF Level 4, Credits 8.
- 313908000-KM-02, The sugar manufacturing process, at NQF Level 5, Credits 12.
- 313908000-KM-03, Sugar processing factory control calculations, at NQF Level 5, Credits 12.
- 313908000-KM-04, Sugar juice extraction, at NQF Level 4, Credits 4.
- 313908000-KM-05, Sugar juice handling and clarification, at NQF Level 5, Credits 4.
- 313908000-KM-06, Evaporation, at NQF Level 5, Credits 8.
- 313908000-KM-07, Pan Boiling theory and technology, at NQF Level 5, Credits 8.
- 313908000-KM-08, Crystallisation, Centrifuging and Drying, at NQF Level 5, Credits 4.
- 313908000-KM-09, Water and effluent treatment, at NQF Level 4, Credits 4.
- 313908000-KM-10, Sugar refining, at NQF Level 5, Credits 4.
- 313908000-KM-11, Operations management, at NQF Level 5, Credits 12.
- 313908000-KM-12, Safety, Health, Environment, Risk and Quality Control, (SHERQ), at NQF Level 5, Credits 8.
- 313908000-KM-13, Mechanical maintenance, at NQF Level 5, Credits 4.
- 313908000-KM-14, Operational communication and reporting, at NQF Level 4, Credits 4.

Total number of Credits for Knowledge Modules: 96.

Practical Skill Modules:

- 313908000-PM-01, Monitor and control sugar processing equipment, at NQF Level 5, Credits 16.
- 313908000-PM-02, Control sugar milling operations and resources, at NQF Level 5, Credits 8.
- 313908000-PM-03, Monitor and direct subordinate performance and conduct, at NQF Level 5, Credits 8.
- 313908000-PM-04, Enforce compliance to Safety, Health, Environmental protection and Quality standards, at NQF Level 5, Credits 6.
- 313908000-PM-05, Conduct and respond to in-line quality tests and reports, at NQF Level 5, Credits 8.
- 313908000-PM-06, Inspect and coordinate maintenance of equipment, at NQF Level 5, Credits 8.
- 313908000-PM-07, Compile and present production reports, at NQF Level 4, Credits 4.

Total number of Credits for Practical Skill Modules: 58.

This qualification also requires the following Work Experience Modules:

- 313908000-WM-01, Sugar processing equipment control procedures, at NQF Level 5, Credits 28.
- 313908000-WM-02, Sugar processing resource control procedures, at NQF Level 5, Credits 16.
- 313908000-WM-03, Safety, health, environmental protection and quality compliance procedures, at NQF Level 5, Credits 16.
- 313908000-WM-04, Mechanical equipment functionality and availability processes, at NQF Level 4, Credits 16.

Total number of Credits for Work Experience Modules: 76.

EXIT LEVEL OUTCOMES

1. Control sugar processing equipment to achieve planned operational outputs within product specifications.
2. Control sugar milling operations and resources to achieve efficiency standards.
3. Monitor and enforce compliance, safety, health, environmental protection, quality and procedures in a sugar processing plant.
4. Monitor and ensure the integrity of operational equipment and facilities for a sugar processing plant.

ASSOCIATED ASSESSMENT CRITERIA

Associated Assessment Criteria for Exit Level Outcome 1:

- Knowledge of sugar processing technology, equipment and processes in the control of equipment is applied.
- Cane yard operations to ensure required cane supply to the mill are controlled and coordinated.
- Extraction operations are controlled to maximise sugar recovery.
- Juice clarification operations to minimise turbidity and sucrose losses are undertaken.
- Juice evaporation operations to satisfy factory requirements are carried out.
- Pan Boiling operations to produce sugar of consistent quality within specification and to minimise sugar losses in molasses are controlled and coordinated.
- Centrifugation operations to achieve the required sugar molasses quality are controlled and coordinated.
- Knowledge of the application of mass and energy balances to control sugar processing operations is applied.
- Factory performance figures to optimise factory operations through liaison with relevant parties are monitored, assessed and used.
- Equipment utilisation and procedures (e.g. start-up, shut down, purging, cleaning, lock out, emergency stop, shift handover) for a sugar processing line are controlled.
- Instrumentation readings on equipment operation within required specifications and adjustments to equipment settings where required are monitored and controlled.

Associated Assessment Criteria for Exit Level Outcome 2:

- Knowledge of operational management to control a sugar processing plant is applied.
- Production demands by planning, scheduling and monitoring sugar processing operations and resources requirements are met.
- Labour requirements for specific production runs are met and shift rosters are drawn up.
- Subordinate performance in accordance with accepted industrial relations practices and supervisory concepts are monitored and directed.

Associated Assessment Criteria for Exit Level Outcome 3:

- Safety Health, Environment and Quality control concepts are applied.
- Risk assessments to monitor and control operational activities in a sugar process plant are conducted.
- Various analytical methods to determine quality indicators such as Pol, Brix and Purity values are applied.
- Sugar process samples are analysed and interpreted.
- Sampling practices are monitored and controlled to ensure reliability and validity of results.
- Quality reports are analysed and corrective measures are formulated and acted upon.
- Incident/accident investigations are conducted in accordance with procedures and regulatory requirements.
- Actual or potential unsafe work practices or conditions through structured inspections are identified.
- Safety procedures are executed (lockdown, emergency shutdown, emergency evacuation, restricted access to high risk areas) and adherence is enforced.
- Statutory safety, health and environmental protection inspections, registers, records and reporting standards are maintained.

Associated Assessment Criteria for Exit Level Outcome 4:

- Equipment are inspected for mechanical soundness and compliance with safety, health, environmental and quality assurance requirements.
- Maintenance requests (not scheduled) are generated and work done is evaluated.
- The execution of standard equipment and lubrication procedures to ensure operational functionality are monitored.
- Equipment functionality and downtime per category/incident/equipment records are maintained.

Integrated Assessment:

Integrated formative assessment:

The skills development provider will use the curriculum to guide them on the stipulated internal assessment criteria and weighting. They will also apply the scope of practical skills and applied knowledge as stipulated by the internal assessment criteria. This formative assessment leads to entrance into the integrated external summative assessment.

Integrated summative assessment:

An external integrated summative assessment, conducted through the relevant QCTO Assessment Quality partner is required for the issuing of this qualification. The external integrated summative assessment will focus on the exit level outcomes and associated assessment criteria. The learner will be provided with case studies and/or scenarios for the external assessment event. The learner will prepare a presentation on the case studies and or scenarios that will be delivered to assessors during a panel assessment. The assessors will be appointed for every registered assessment site and will be persons that were not involved as facilitators of learning.

INTERNATIONAL COMPARABILITY

The international comparability study was conducted to examine comparable qualifications and programmes, which exist in other countries. The comparability exercise focused on two countries namely, Mauritius and India.

The Regional Training Centre in Mauritius:

The Regional Training Centre (RTC) was established under the United Nations Development Program (UNDP) as a regional sugar cane training centre for Africa. The RTC offers a qualification in Cane Sugar Manufacture. The content of the qualification in comprises the following areas of learning:

- Cane handling and preparation.
- Cane diffusion, milling and imbibitions.
- Juice weighing, heating, clarification and filtration.
- Evaporation.
- Massecuite: Pan boiling, crystallisation and exhaustibility.
- Sugar: Centrifugal, quality and refining.
- Energy: Steam production and electricity generation.

Vasantdada Sugar Institute (VSI) in India:

The Vasantdada Sugar Institute (VSI) in India offers a two year qualification in Sugar Technology

comprising of the following areas of learning:

- Chemistry: Organic Chemistry, Biochemistry, Chemical Control.
- Engineering: Sugar Engineering, Chemical Engineering, Instrumentation, Process Instrumentation and Control, Engineering Design and Drawings.
- Sugar Processing: Clarification and Filtration, Sugar Manufacture, Crystallisation, Centrifugal, By-products, Advanced Sugar Technology.

Conclusion:

The qualification offered by the Regional Training Centre in Mauritius compares favourably with South African qualification in terms of scope, content and duration.

The general scope of the qualification offered by the Vasantdada Sugar Institute compares favourably with South African qualification but includes specific reference of learning related to engineering and chemistry that are not included in the South African qualification.

ARTICULATION OPTIONS

This qualification articulates horizontally to the:

- National Diploma in Maintenance of High-speed Production Processes at NQF Level 5.
- Higher Certificate in Supervisory Management at NQF Level 5.
- National Certificate in Generic Management at NQF Level 5.

This qualification articulates vertically to the:

- National Diploma in Food Technology at NQF Level 6.
- Advanced Certificate in Management at NQF Level 6.

MODERATION OPTIONS

N/A

CRITERIA FOR THE REGISTRATION OF ASSESSORS

N/A

NOTES

N/A

UNIT STANDARDS:

This qualification is not based on Unit Standards.

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION:

NONE

PROVIDERS CURRENTLY ACCREDITED TO OFFER THIS QUALIFICATION:

This information shows the current accreditations (i.e. those not past their accreditation end dates), and is the most complete record available to SAQA as of today. Some Primary or Delegated Quality Assuring Bodies have a lag in their recording systems for provider accreditation, in turn leading to a lag in notifying SAQA of all the providers that they have accredited to offer qualifications and unit standards, as well as any extensions to accreditation end dates. The relevant Primary or Delegated Quality Assuring Body should be notified if a record appears to be missing from here.

NONE

source.