

NO. 416

11 May 2007

**SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)**

In accordance with Regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Chemical Industries

registered by Organising Field 06 – Manufacturing, Engineering and Technology, publishes the following qualification and unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualification and unit standards. The full qualification and unit standards can be accessed via the SAQA web-site at www.saga.org.za. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the qualification and unit standards should reach SAQA at the address below and no later than **11 June 2007**. All correspondence should be marked Standards Setting – Chemical Industries and addressed to

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SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:**Further Education And Training Certificate: Chemical Operations**

SAQA QUAL ID	QUALIFICATION TITLE		
58538	Further Education And Training Certificate: Chemical Operations		
SGB	PROVIDER		
Chemical Industries SGB			
ETQA			
QUALIFICATION TYPE	FIELD	SUBFIELD	
Further Ed and Training Cert	6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly	
ABET BAND	MINIMUM CREDITS	NQF LEVEL	QUAL CLASS
Undefined	140	Level 4	Regular-Unit Stds Based

PURPOSE AND RATIONALE OF THE QUALIFICATION

Purpose:

This qualification is used to address the training needs for an internal process controller. This competence provides the skills needed to take responsibility for a significant process in the chemical operations industry. It also provides the basis upon which further related learning and career development can take place.

Through the employment of competent operating personnel, employers and in turn the field and sub-field have confidence that this critical work in the industry is efficiently carried out.

Social development and economic transformation are enhanced through efficient production, and career development and personal job satisfaction of operating personnel are facilitated through the learning process used to achieve the competency specified.

Qualifying learners will:

Have an understanding of the various process operations that are used in chemical operations:

- Apply scientific principles in the processing industry.
- Act as a process expert to assist others to understand the process and operational issues better.
- Control chemical process operations in a process environment.

Rationale:

This qualification replaces the National Certificate in Chemical Process Operations, NQF Level 4 (ID 22868).

This is the third qualification in a series for people working in the chemical operations industry who need to progress beyond NQF Level 3 and for learners who want to progress in the chemical operations industry. The qualification reflects the workplace-based common or non-specific needs that a learner requires in the chemical operations industry, before progressing to learning at a higher level.

Typical learners are operating personnel working in a chemical processing plant. The chemical processing industry is well established in South Africa and its success is dependant upon the efficient production of chemical products. Achievement of this objective is largely dependant upon the competence, recognised by this qualification, of the people who operate chemical processing equipment. An adequate number of people with these skills are needed to ensure that the production units in South Africa operate productively.

Competence in chemical process operations requires appropriate general, chemical specific technical & other knowledge and *its* application; as well as expertise in operating production equipment and controlling a chemical process. This knowledge and expertise can form a basis for further learning particularly in the production/operational, engineering and supervisory aspects of chemical operations and similar industries in the chemical and other sectors.

RECOGNIZE PREVIOUS LEARNING?

Y

LEARNING ASSUMED TO BE IN PLACE

It is assumed that learners are already competent in Communication and Mathematical Literacy at NQF Level 3.

Recognition of Prior Learning:

Recognition of prior learning must be carried out in accordance with the policy and rules specified and used by the ETQA responsible for evaluation of people seeking RPL for a part of the whole qualification.

Access to the qualification:

Access to this qualification is open. However, it is preferable that learners have completed the National Certificate in Chemical Operations: NQF Level 3.

Access for learners with disabilities is dependant on the:

- Type and severity of the disability.
- Nature of the operational processes and requirements of the equipment

QUALIFICATION RULES

In the compulsory Fundamental Component of the qualification, a learner must demonstrate his/her competence in the 20 credits in the field of Communication in a first language at NQF Level 4, 20 credits in the field of Communication in a second language at NQF Level 3 plus 16 credits in the field of Mathematical Literacy. In the Fundamental Component the learner must therefore demonstrate his/her competence in a total of 56 credits.

The unit standards in the compulsory Core Component of the qualification reflect the skills and competencies needed for building expertise in the chemical operations field. In the Core Component, the learner must demonstrate his/her competence in the total of 55 credits.

The Elective component of the qualification consists of two parts:

- A Compulsory Elective Component with unit standards for automated processes totalling 27 credits, this group of Unit Standards is compulsory for Chemical Operations.
- A General Elective Component with unit Standards covering aspects such as life skills, business and training related skills.

In total the learner must demonstrate his/her competence in a minimum of 29 credits selected from the Elective components.

EXIT LEVEL OUTCOMES

1. Apply scientific principles in the processing industry
2. Demonstrate an understanding of the chemical process and related issues
3. Control chemical process operations in a process environment.

Critical Cross-Field Outcomes:

Each critical cross-field outcome was considered in terms of its applicability to each of the specific outcomes for each unit standard. Where it was found to be applicable, the nature of the skills being developed was specified by the working group and captured in the standard.

Critical cross-field outcomes are assessed per unit standards and are part of all exit level outcomes.

Critical cross-field outcomes have been addressed by the exit level outcomes as follows:

While performing integrated chemical process operations, qualifying learners can:

Identify and solve problems in which response displays that responsible decisions, using critical and creative thinking, have been made by:

- Responding to emergencies in a processing environment; Evident in Exit Level Outcomes 2.
- Investigating process improvement methods; Evident in Exit Level Outcomes 2,3.
- Applying operating procedures; Evident in Exit Level Outcomes 3.
- Controlling variables impacting on chemical process operations: Evident in Exit Level Outcomes 2,3.

Work effectively with others as a member of a team, group, organisation or community by:

- Working in a coordinated team during system start-up and shut down; Evident in Exit Level Outcome/s 3.
- Guiding and coaching learners: Evident in Exit Level Outcomes 2.
- Participating in a task team; Evident in Exit Level Outcomes 2.
- Co-ordinating one's work with that of others in the direct surrounding area, internal and external operations: Evident in Exit Level Outcomes 2,3.

Organise and manage oneself and one's activities responsibly and effectively by:

- Controlling the integrated process: Evident in Exit Level Outcomes 1, 3.
- Planning and implementing one's own routine operational functions: Evident in all Exit Level Outcomes.
- Planning and implementing corrective action to maintain product quality; Evident in Exit Level Outcomes 3.

Collect, **analyse**, organise and critically evaluate information by:

- Applying scientific principles to complex separation processes; Evident in Exit Level Outcomes 1.
- Investigating process improvement methods; Evident in Exit Level Outcomes 2.
- Monitoring the impact of all process and material variables: Evident in all Exit Level Outcomes.
- Managing records, reports and stock: Evident in Exit Level Outcomes 2,3.

Communicate effectively by using mathematical and/or language skills in the modes of oral and/or written presentations by:

- Recording and interpretation of instrument readings; Evident in Exit Level Outcomes 2,3.
- Guiding and coaching learners; Evident in Exit Level Outcomes 2.
- Making recommendations to the task team; Evident in Exit Level Outcome/s 2.
- Preparing and presenting reports; Evident in Exit Level Outcomes 2,3.

Use science and technology effectively and critically, showing responsibility towards the environment and health of others by:

- Applying environmental protection practices through water treatment processes; Evident in Exit Level Outcomes 1.
- Applying the concepts related to energy and power in a process environment; Evident in Exit Level Outcome/s 1.
- Controlling technologically advanced production equipment according to operating procedures; Evident in Exit Level Outcomes 3.
- Working and interpreting technologically advanced instrumentation and computer systems; Evident in Exit Level Outcome/s 1,3.

Demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation by:

- Participating in quality assurance practices; Evident in Exit Level Outcomes 2,3.
- Adjusting equipment and machinery while taking cognisance of the downstream impact; Evident in all Exit Level Outcomes.

Contribute to the full personal development of each learner and the social and economic development of the society at large by:

- Maintaining and applying safety practices in the processing environment; Evident in Exit Level Outcome/s 2,3.
- Maintaining and applying quality practices in the processing environment; Evident in Exit Level Outcome/s 2,3.
- Performing core operating functions; Evident in Exit Level Outcomes 1,3.

ASSOCIATED ASSESSMENT CRITERIA

1.

- Chemical principles are explained and applied in a process environment.
- The concepts related to energy and power are applied in a process environment.
- The scientific basis and operational principles underlying complex separation processes are explained with examples.

2.

- Process problems are resolved in accordance with set requirements.
- Plant safety, quality and efficiency is improved in accordance with organisational requirements.
- Process improvement methods are investigated and recommendations are made.

3.

- The process is controlled using various automated methods.
- The impact of all process and material variables is integrated as required
- Corrective action is taken to maintain product and process integrity.

Integrated Assessment:

The applied competence (practical, foundational and reflexive competencies) of this qualification will be achieved if a candidate is able to achieve all the exit level outcomes of this qualification.

Appropriate methods and tools must be used to assess practical, foundational and reflexive competence of the learner in all the exit level outcomes listed above, as well as to determine a learner's ability to solve problems, work in a team, organize him/herself, use applied science, and understand the implications of actions and reactions in the world as a set of related systems. Such an assessment process will determine development of the whole person, and the integration of applied knowledge and skills.

Assessors should develop, conduct, and ensure integration of, assessment by making use of a range of formative and summative assessment methods against the unit standards that make up the qualification. Combinations of applied, foundational and reflective competencies, including critical cross-field outcomes, should be assessed wherever possible.

Moderators should ensure that assessment is valid, consistent and integrated into work or learning, and that there is sufficient and authenticated evidence of learner competence against the whole qualification.

INTERNATIONAL COMPARABILITY

Benchmarking was done against the NVQ from Britain, the Australian and New Zealand Qualifications Frameworks.

African countries with manufacturing facilities (including SADC countries) were scanned for applicable qualifications or training programmes, but no relevant qualifications are offered in any of these countries.

Good international comparability, including similar core qualification structures and progressions from NQF Level 1 to NQF Level 4, were found in the Australian and British qualifications.

A comparison with the British qualification was included, because the British chemical industry is very well developed and the NVQ is an educational structure comparable to the NQF. An internet search revealed that the City & Guilds Level 4 NVQ in Chemical, Pharmaceutical and Petro-Chemical Operations focuses on providing Technical Support training. The qualification contains compulsory core units consisting of safety, teamwork, work handover; three compulsory units related to technical support; and a choice of five elective units from a range with a high quality component, emergencies, energy optimisation and problem solving.

Australia:

The Australian processing industry is of a similar size and sophistication as the South African industry. For this reason a comparison with the Australian qualification was included, as well as the AQF being an educational structure comparable to the NQF. An internet search of the AQF revealed that the Australian Certificate IV in Process Plant Technology contains the same compulsory core units on communication, safety, quality and work procedures which are also included in the previous levels. (These five units do not have to be repeated if completed previously). The qualification consists of 26 units, but if the core units have been completed previously, the learner only has to complete 21 units in total. At least five units have to be chosen from a range of technical and operational units with the emphasis on control and supervision. The rest of the qualification is made up of units from other training packages or the learner is allowed to choose elective unit standards in domains that are comparable to what is required for the local qualification, e.g. lead teams, implement operational plans, and process supervision.

New Zealand:

Research in the NZQA showed that a Certificate in Energy and Chemical Plant (Process Operation) (level 4) is registered. This qualification allows for optional strands in Refrigeration, Steam Generation, Ancillary Operations, Geothermal, Waste Management and Co-Generation. The basic Process Operation qualification contains 9 compulsory core unit standards consisting

of 1 workplace communication unit standard and 8 processing operations and safety unit standards, totalling 58 credits.

If the learner wants to gain competence in one of the strands mentioned above, ≥ further range of elective unit standards specific to that area of specialisation has to be chosen.

The content of this qualification is similar to that contained in the South African NQF Level 3 qualification, namely: communication, safety, quality control and equipment operation, monitoring and maintenance. The main difference between this qualification and the South African NQF Level 4 qualification is that the learner is not trained to take up the control of a process in a chemical plant.

Both local and international qualifications place high emphasis on safety with a range of unit standards relating to hazards, emergencies and environmental protection included.

The Chemical Operations Qualification compares well with the best international qualifications and training programmes offered. The compulsory technical content incorporated in the qualification will serve to support qualifying learners to make better informed, autonomous decisions within a more compact timeframe than international learners and will increase transportability of the qualification considerably.

ARTICULATION OPTIONS

This qualification is the final qualification in a series of four chemical operations qualifications and it will allow the learner a vertical progression from the NQF Level 3 qualification. The qualifying learner may progress into a NQF Level 4 supervisory internal process controller role in the chemical process operations industry.

This qualification allows for vertical progression into tertiary education because the qualification has specifically been designed to allow for further study at a technical university.

The generic knowledge and expertise enables the learner to progress horizontally in a range of other processing operations or to develop a career where knowledge of chemical operations is necessary

Horizontal articulation within the processing industry can occur with the following registered NQF Level 4 qualifications:

- ID 48915: Further Education Training Certificate: Manufacturing and Assembly Operations Supervision, NQF Level 4.
- ID 48643: Further Education Training Certificate: Chemical Pulp Manufacturing, NQF Level 4.
- ID 48645: Further Education Training Certificate: Pulp and Paper Chemical Recovery, NQF Level 4.
- ID 49049: Further Education Training Certificate: Lump Ore Beneficiation, NQF Level 4.
- ID 48919: Further Education Training Certificate: Measurement, Control and Instrumentation, NQF Level 4.
- ID 48399: Further Education Training Certificate: Sugar Processing, NQF Level 4.
- ID 21496: Further Education Training Certificate: Dry Lumber Processing, NQF Level 4.

MODERATION OPTIONS

- Anyone moderating the assessment of learners against this Qualification must be registered as a moderator with the relevant ETQA.
- Any institution offering learning that will enable the achievement of this Qualification must be accredited or recognised as a provider with the relevant ETQA.
- Assessment and moderation will be overseen by the relevant ETQA according to the ETQA's policies and guidelines for assessment and moderation; in terms of agreements reached around

assessment and moderation between ETQAs (including professional bodies); and in terms of the moderation guideline detailed immediately below.

- Moderation must include both internal and external moderation of assessments at exit points of the qualification, unless ETQA policies specify otherwise. Moderation should also encompass achievement of the competence described both in individual unit standards, exit level outcomes as well as the integrated competence described in the qualification.
- Anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

In order to assess this qualification, the assessor needs:

- Well developed interpersonal skills.
- Assessors to meet the requirements of the generic assessor standards.
- Competence against the unit standard "Conduct outcomes-based assessments".
- Detailed documentary proof of educational qualification, practical training undergone, and/or experience gained at an appropriate level in the work concerning the production of molten glass. This must meet the relevant ETQA policies and guidelines. The subject matter expertise of the assessor can be established through the recognition of prior learning.
- Registration with, or recognition by, the relevant ETQA as specified through an appropriate memorandum of understanding.

NOTES

This qualification replaces qualification 22868, "National Certificate: Chemical Process Operations", Level 4, 126 credits.

Range of equipment covered:

A system is understood to be equipment operated in combination to achieve a desired result in process operation.

Operating a system includes the integrated operation of the equipment that makes up the system.

Range statements:

This qualification addresses the theoretical knowledge required by learners in the processing industries.

Knowledge relating to the processing industries includes process specific technology, communication, mathematics, applied science, and SHEQ.

This qualification may be applicable to other processing operations. This is subject to its acceptance by appropriate subject matter experts.

UNIT STANDARDS

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Core	244097	Demonstrate an understanding of the principles of work energy and power in physics	Level 4	6
Core	244089	Understand applications of Physical Chemistry in a processing environment	Level 4	6
Core	244099	Demonstrate understanding of liquid-liquid and liquid-vapour separation processes	Level 4	10
Core	244105	Participate in a task team in a process environment	Level 4	4
Core	117877	Perform one-to-one training on the job	Level 3	4
Core	244102	Demonstrate understanding of water treatment processes	Level 4	10
Core	244100	Apply integrated process control methods	Level 4	15
Elective	244106	Use standard operating procedures to control a process from a panel or computer interface	Level 4	15

	ID	UNIT STANDARD TITLE	LEVEL	CREDITS
Elective	115753	Conduct outcomes-based assessment	Level 5	15
Elective	14667	Describe and apply the management functions of an organization	Level 4	10
Elective	113909	Coach a team member in order to enhance individual performance in work environment	Level 3	5
Elective	12544	Facilitate the preparation and presentation of evidence for assessment	Level 4	4
Elective	244103	Use automated control techniques to control a process	Level 4	8
Elective	13670	Demonstrate an understanding of the relevance of key policies to environmental education	Level 4	2
Elective	9533	Use communication skills to handle and resolve conflict in the workplace	Level 3	3
Elective	117132	Explain basic economics	Level 3	3
Elective	244104	Issue a permit to work in a process environment	Level 4	4
Elective	244101	Use a panel or a computer interface to control a process	Level 4	4
Fundamental	119472	Accommodate audience and context needs in oral/signed communication	Level 3	5
Fundamental	119457	Interpret and use information from texts	Level 3	5
Fundamental	119465	Write/present/sign texts for a range of communicative contexts	Level 3	5
Fundamental	119458	Analyse and respond to a variety of literary texts	Level 3	5
Fundamental	119466	Interpret a variety of literary texts	Level 3	5
Fundamental	119467	Use language and communication in occupational learning programmes	Level 3	5
Fundamental	9303	Communicate verbally with clients in a financial environment	Level 3	3
Fundamental	119459	Write/present/sign for a wide range of contexts	Level 4	5
Fundamental	119462	Engage in sustained oral/signed communication and evaluate spoken/signed texts	Level 4	5
Fundamental	119469	Read/view, analyse and respond to a variety of texts	Level 4	5
Fundamental	119470	Evaluate literary texts	Level 4	5
Fundamental	119461	Make and motivate judgements on selected literary texts	Level 4	5
Fundamental	119471	Use language and communication in occupational learning programmes	Level 4	5
Fundamental	12153	Use the writing process to compose texts required in the business environment	Level 4	5
Fundamental	9302	Access information in order to respond to client enquiries in a financial services environment	Level 3	2
Fundamental	12154	Apply comprehension skills to engage oral texts in a business environment	Level 4	5
Fundamental	12155	Apply comprehension skills to engage written texts in a business environment	Level 4	5
Fundamental	9016	Represent analyse and calculate shape and motion in 2- and 3-dimensional space in different contexts	Level 4	4
Fundamental	7468	Use mathematics to investigate and monitor the financial aspects of personal, business, national and international issues	Level 4	6
Fundamental	9015	Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems	Level 4	6



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UNIT STANDARD:Understand applications of Physical **Chemistry** in a processing environment

SAQA US ID	UNIT STANDARD TITLE		
244089	Understand applications of Physical Chemistry in a processing environment		
SGB	PROVIDER		
Chemical Industries SGB			
FIELD	SUBFIELD		
6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly		
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	6

SPECIFIC OUTCOME 1

Explain the relationship between the pressure and volume of a gas in terms of scientific principles.

SPECIFIC OUTCOME 2

Explain the relationship between the temperature and pressure of a gas in terms of scientific principles.

SPECIFIC OUTCOME 3

Explain the general gas equation in terms of scientific principles

SPECIFIC OUTCOME 4

Describe a model for the behaviour of liquids

SPECIFIC OUTCOME 5

Explain the concept of solutions



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate an understanding of the principles of work, energy and power in physics

		PROVIDER	
Chemical Industries SGB			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Engineering and Related Design	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	6

SPECIFIC OUTCOME 1

Demonstrate an understanding of the concepts of momentum and impulse

SPECIFIC OUTCOME 2

Demonstrate an understanding of work, energy and power.

SPECIFIC OUTCOME 3

Demonstrate an understanding of levers, moments and beams.

SPECIFIC OUTCOME 4

Demonstrate an understanding of centre of gravity and centroids



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Demonstrate understanding of liquid-liquid and liquid-vapour separation processes

SAQA US ID		UNIT STANDARD TITLE	
244099		Demonstrate understanding of liquid-liquid and liquid-vapour separation	
SGB		PROVIDER	
Chemical Industries SGB			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
AEETBAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	10

SPECIFIC OUTCOME 1

Demonstrate an understanding of distillation applications

SPECIFIC OUTCOME 2

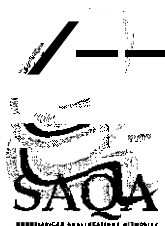
Demonstrate an understanding of evaporation applications.

SPECIFIC OUTCOME 3

Demonstrate an understanding of condensation applications

SPECIFIC OUTCOME 4

Demonstrate an understanding of absorption applications.



SOUTH AFRICAN QUALIFICATIONS AUTHORITY

UNIT STANDARD:

Apply integrated process control methods

SAQA US ID	UNIT STANDARD TITLE		
244100	Apply integrated process control methods		
SGR	PROVIDER		
Chemical Industries SGB			
FIELD	SUBFIELD		
6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly		
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	15

SPECIFIC OUTCOME 1

Demonstrate understanding of an entire process

SPECIFIC OUTCOME 2

Describe the functioning of each piece of equipment in the process.

SPECIFIC OUTCOME 3

Use process control options in the process

SPECIFIC OUTCOME 4

Control the process to within process and product parameters.

SPECIFIC OUTCOME 5

Control the process for maximum efficiency



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UNIT STANDARD:

SGB		PROVIDER	
Chemical Industries SGB			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD N P E	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	4

SPECIFIC OUTCOME 1

Explain the functions of the different elements used in a control system.

SPECIFIC OUTCOME 2

Use basic system functions.

SPECIFIC OUTCOME 3

Retrieve information from the system.

SPECIFIC OUTCOME 4

Adjust process parameters



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UNIT STANDARD:

Demonstrate understanding of water treatment processes

SAQA US ID	UNIT STANDARD TITLE		
244102	Demonstrate understanding of water treatment processes		
SGB	PROVIDER		
Chemical Industries SGB			
FIELD	SUBFIELD		
6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly		
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	10

SPECIFIC OUTCOME 1

Demonstrate an understanding of flocculation process applications

SPECIFIC OUTCOME 2

Demonstrate an understanding of ion-exchange process applications

SPECIFIC OUTCOME 3

Demonstrate an understanding of coagulation process applications.

SPECIFIC OUTCOME 4

Demonstrate an understanding of precipitation based process applications



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UNIT STANDARD:***Use automated control techniques to control a process***

SAQA US ID	UNIT STANDARD TITLE		
244103	Use automated control techniques to control a process		
SGB	PROVIDER		
Chemical Industries SGB			
FIELD	SUBFIELD		
6 - Manufacturing, Engineering and Technology	Engineering and Related Design		
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	8

SPECIFIC OUTCOME 1

Explain the purpose of using different process control techniques.

SPECIFIC OUTCOME 2

Explain the operating principles of different process control techniques

SPECIFIC OUTCOME 3

Describe the operation of all process control techniques used in a process.

SPECIFIC OUTCOME 4

Use process control techniques to control a process.



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UNIT STANDARD:

Issue *a permit to work in a process environment*

SAQA US ID	UNIT STANDARD TITLE		
244104	Issue a permit to work in a process environment		
SGB Chemical Industries SGB	PROVIDER		
FIELD 6 - Manufacturing, Engineering and Technology	SUBFIELD Manufacturing and Assembly		
ABET BAND Undefined	UNIT STANDARD TYPE Regular	NQF LEVEL Level 4	CREDITS 4

SPECIFIC OUTCOME 1

Explain the application of the work permit system in a processing environment.

SPECIFIC OUTCOME 2

Prepare to issue a work permit

SPECIFIC OUTCOME 3

Issue a work permit.

SPECIFIC OUTCOME 4

Monitor the implementation of permit conditions.



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UNIT STANDARD:

Participate in a task team in a process environment

SAQA US ID		UNIT STANDARD TITLE	
244105		Participate in a task team in a process environment	
SGB		PROVIDER	
Chemical industries SGB			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	4

SPECIFIC OUTCOME 1

Contribute to team meetings

SPECIFIC OUTCOME 2

Investigate the improvement of methods or systems

SPECIFIC OUTCOME 3

Propose improved methods or systems

SPECIFIC OUTCOME 4

Contribute to a review process



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UNIT STANDARD:

Use standard operating procedures to control a process from a panel or computer interface

244106		Use standard operating procedures to control a process from a panel or computer interface	
Chemical Industries SGB			
FIELD		SUBFIELD	
6 - Manufacturing, Engineering and Technology		Manufacturing and Assembly	
ABET BAND	UNIT STANDARD TYPE	NQF LEVEL	CREDITS
Undefined	Regular	Level 4	15

SPECIFIC OUTCOME 1

Apply SOPs to establish start-up conditions in a process,

SPECIFIC OUTCOME 2

Apply SOPs in starting up a process.

SPECIFIC OUTCOME 3

Apply SOPs to achieve normal operating conditions after start-up

SPECIFIC OUTCOME 4

Apply SOPs to correct abnormal operating conditions

SPECIFIC OUTCOME 5

Apply SOPs in emergencies

SPECIFIC OUTCOME 6

Apply SOPs in shutting down a process.