No. 442 **25 April 2008**

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

Power Plant Operations

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.saqa.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 23 May 2008.*** All correspondence should be marked **Standards Setting – SGB for Power Plant Operations** and addressed to

The Director: Standards Setting and Development
SAQA
Attention: Mr. D. Mphuthing
Postnet Suite 248
Private Bag X06
Waterkloof
0145
or faxed to 012 – 431-5144
e-mail: dmphuthing@saqa.org.za

P.P DR S. BHIKHA
DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
National Diploma: Power Plant Process Control Operations

SAQA QUAL ID	*QUALIFICATION TITLE*		
61570	National Diploma: Power Plant Process Control Operations		
ORIGINATOR		*PROVIDER*	
SGB Power Plant Operations			
QUALIFICATION TYPE	*FIELD*	*SUBFIELD*	
National Diploma	6 - Manufacturing, Engineering and Technology	Manufacturing and Assembly	
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUAL CLASS*
Undefined	241	Level 5	Regular-Unit Stds Based

This qualification replaces:

Qual ID	Qualification Title	NQF Level	Min Credits	Replacement Status
23679	National Diploma: Fossil Power Plant Process Control	Level 5	248	Will occur as soon as 61570 is registered
23734	National Diploma: Nuclear Power Plant Process Control	Level 5	295	Will occur as soon as 61570 is registered
23736	National Diploma: Hydro Power Plant Process Control	Level 5	241	Will occur as soon as 61570 is registered

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

Learners obtaining this qualification will be recognised on a national level for performing process control activities on a power plant. This qualification will ensure professionalism, proficiency and excellence in the control of Power Plant Generation Units. It will also assist in changing perceptions on the status and functional levels of process controllers in Power Plant Generation. The qualification will provide the incumbents with pride, self worth and enhance their morale.

Worth to the employer will be manifested in the competence of the employee in terms of safe, sound and efficient operations performed by the process controller. This qualification will provide standards for recognition of prior learning of existing process controller competence throughout the industry and allow credits to be obtained in cross-functional learning fields.

On acquiring this qualification they will have skills, knowledge and behavioural competence to perform the following:

> To objectively recognise what is happening in or across situations with people, plant and materials.
> To recognise the direct impact of decisions and actions and the effects on plant and people in the direct work environment.
> To decide upon the most appropriate action after problems were recognised, analysed and the options evaluated.
> To listen, question, observe, describe accurately and align with the senders' needs.
> To order resources, ideas, events, people and plant to enable required events, to operate at organisation and system level.

> To know the energy flow through the conversion process and the key conversion process concepts are understood.
> To know the theory of application of mechanical, electrical and instrumentation plant components and their interrelationship to the plant is known and understood.
> To know Interrelated plant processes and safety equipment are operated and controlled safely and efficiently.
> To complete and process relevant documentation correctly according to operating procedures, service notifications and authorisation requirements.
> The trends / incidents related to the specific plant are understood.
> Concepts, terms and theory of the specified technical field as for the prescribed subjects are known.
> To control the operation of the plant to stay within the set limits for environmental impact.
> Process chemistry fundamentals applicable to the process plant and the implications of operating outside of chemical specifications are known and understood.
> To train and control subordinates in their adherence to the Regulations.
> To lead staff in accordance with the organization's purpose, values and vision.
> To utilize the computer to manage / control the plant processes and analyse plant and conditions.
> Production targets by planning, organising, leading and controlling of staff, and motivating and influencing their behaviour create effective working relationships.

Rationale:

This qualification is designed for learners who will be responsible for controlling integrated processes on a specific Power Plant from remote located control centres.

This qualification is based on the power generation industry needs in building competence in the workplace for the specific Power Plant Process Control Operations. The qualification therefore sets national standards for Power Plant Control Operators in a specific Power Plant Process Control Operations environment.

This qualification is a direct outcome of the revision of the ND: Power Plant Operations, NQF Level 5 suite of qualifications with ID. No. 23679, 23734 and 23736 the demand for which was based on the transformation of the existing qualifications into a qualification with specializations that meets the needs of the relevant industry, supporting the principles of the NQF and providing the flexibility of bridging into a management qualification with a strong customer focus.

This qualification provides the learner with accessibility to be employed within the process control function on a specific Power Plant Unit.

Other considerations in the national interest addressed by this Qualification are:

> Setting national standards of practice in these specific learning fields building individual capacity in these specialized professions.
> Ensuring entry, progression and mobility into Life Long Learning in these specific learning fields addressing Power Plant Operations.
> Adhering to industry specific employment requirements.
> Enhancing of professional competence on a national level providing an avenue of upliftment for the previously disadvantaged into this professional discipline.
> Providing qualifications to be used in learnerships in these fields.
> Enhancing social and economic development.

RECOGNIZE PREVIOUS LEARNING?
Y

LEARNING ASSUMED IN PLACE

It is assumed that learners are already competent in:

> Communication and Mathematical Literacy, NQF Level 4.
> Computer Literacy, NQF Level 4.
> Electrical Engineering Fundamentals, NQF Level 3 with the following unit standards:
> ID 10893: Demonstrate knowledge and understanding of electrical power generation.
> ID 14204: Interpret basic electronic theories in Power Plant Process Control.
> ID 10894: Interpret electrical circuits.
> ID 10677: Interpret electrical theories.
> ID 10719: Understand the operating principles of transformers.
> ID 10707: Understanding the principles of magnetism.

Recognition of Prior Learning:

> These qualifications will be achieved in part or in whole through the RPL processes.
> Evidence of prior learning must be assessed through formal RPL processes through recognised methods.
> Any other evidence of prior learning should be assessed through formal RPL processes to recognise achievement thereof.

Access to the Qualification:

Access is open to all learners in possession of an FETC or equivalent NQF Level 4 qualification. It is preferable that learners have completed the:

> FETC: Power Plant Operations.

QUALIFICATION RULES
> All the Fundamental Unit Standards totalling 27 credits are compulsory.

> All the Core Unit Standards totalling 81 credits are compulsory.

> Learners are to choose an Elective Specialization and complete the required unit standards as designated for each specialization.

Specialization Area 1: Hydro Power Plant Process Control Operations:

Choose unit standards totalling a minimum of 145 credits from the Elective Unit Standards listed below:

> ID 13519: Control Load Variation on a Hydro Power Generating Unit in Pumping Mode from a Control Room; NQF Level 5; 4 Credits.
> ID 13520: Control Load Variations on a Hydro Power Generating Unit in Generating and Synchronous Compensation Mode from a Control Room; NQF Level 5; 4 Credits.
> ID 13523: Monitor and Sustain Plant Operability of a Hydro Power Generating Unit from the Control Room; NQF Level 5; 7 Credits.
> ID 13525: Monitor and Sustain Plant Operability on Hydro Power Generation Auxiliary Systems from Control Centres; NQF Level 5; 10 Credits.
> ID 10899: Shutdown Hydro Power Generation Auxiliary Systems from Control Centres; NQF Level 5; 10 Credits.
> ID 13521: Shutdown Hydro Power Generation Unit from a Control Room; NQF Level 5; 12 Credits.
> ID 13526: Stabilise Out of Normal and or Emergency Condition on Hydro Power Generation Unit from a Control Room; NQF Level 5; 15 Credits.
> ID 13527: Stabilise Out of Normal and or Emergency Conditions on Hydro Power Generation Auxiliary Systems; NQF Level 5; 11 Credits.

> ID 13517: Start-up Hydro Power Generating Auxiliary Systems from Control Centres; NQF Level 5; 13 Credits.
> ID 10898: Start-up Hydro Power Generating Unit from a Control Room; NQF Level 5; 32 Credits.
> ID 14053: Demonstrate Knowledge Of Corrosion Control; NQF Level 5; 7 Credits.
> ID 116434: Control electrical networks from a control centre; NQF Level 4; 10 Credits.
> ID 116453: Perform operations on high voltage integrated systems; NQF Level 4; 4 Credits.
> ID 14057: Demonstrate knowledge and understanding of electrical systems and related concepts; NQF Level 4; 6 Credits.

Total Elective Credit Component = 145 Credits.

Specialization Area 2: Fossil Power Plant Process Control Operations:

Choose unit standards totalling a minimum of 133 credits from the Elective Unit Standards listed below:

> ID 14057: Demonstrate knowledge and understanding of electrical systems and related concepts; NQF Level 4; 6 Credits.
> ID 14055: Understand water chemistry in a power plant environment; NQF Level 4; 3 Credits.
> ID 13562: Control load variation on a fossil fired steam generator from a control room; NQF Level 5; 7 Credits.
> ID 13596: Control load variations on a fossil fired power generation unit from a control room; NQF Level 5; 9 Credits.
> ID 13564: Control load variations on a steam driven turbo-generator from a control room; NQF Level 5; 6 Credits.
> ID 13572: Monitor and Sustain Plant Operability of a Steam Driven Turbo-Generator System from a Control Room; NQF Level 5; 7 Credits.
> ID 255874: Demonstrate Knowledge and Understanding of Pulverised Fuel Firing Regulations (PFFR) as applied on fossil fired power generating plants; NQF Level 5; 3 Credits.
> ID 14053: Demonstrate Knowledge Of Corrosion Control; NQF Level 5; 7 Credits.
> ID 13566: Shut down a fossil fired steam generator from a control room; NQF Level 5; 12 Credits.
> ID 13597: Shutdown a fossil fired power generating unit from a control room; NQF Level 5; 22 Credits.
> ID 13568: Shutdown a steam driven turbo-generator system from a control room; NQF Level 5; 11 Credits.
> ID 13599: Stabilise Out of Normal Emergency Conditions on a Fossil Fired Power Generating Unit from a Control Room; NQF Level 5; 28 Credits.
> ID 13573: Stabilise Out of Normal Emergency Conditions on a Fossil Fired Steam Generator from a Control Room; NQF Level 5; 15 Credits.
> ID 13575: Stabilise Out of Normal Emergency Conditions on a Steam Driven Turbo-Generator System from a Control Room; NQF Level 5; 12 Credits.
> ID 13558: Start up a fossil fired steam generator from a control room; NQF Level 5; 32 Credits.
> ID 13561: Start up a Steam Driven Turbo-Generator from a Control Room; NQF Level 5; 21 Credits.
> ID 255895: Start up a fossil fired power generating unit from a control room; NQF Level 5; 55 Credits.
> ID 13571: Monitor and Sustain Plant Operability on a Fossil Fired Steam Generator from a Control Room; NQF Level 5; 8 Credits.
> ID 255894: Monitor and sustain plant operability on a fossil fired power generating unit from a control room; NQF Level 5; 16 Credits.

Total Fossil Power Credits = 280 Credits.

Specialization Area 3: Nuclear Power Plant Process Control Operations: