No. 283 **13 March 2009**

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

In accordance with Regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Task Team for

Maintenance

registered by Organising Field 06 – Manufacturing, Engineering and Technology, publishes the following Qualifications and Unit Standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the Qualifications and Unit Standards. The full Qualifications 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 Qualifications and Unit Standards should reach SAQA at the address below and ***no later than 14 April 2009.*** All correspondence should be marked **Standards Setting – Task Team for Maintenance** and addressed to

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ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
National Certificate: Diesel Electrical Fitting

SAQA QUAL ID	*QUALIFICATION TITLE*		
66009	National Certificate: Diesel Electrical Fitting		
ORIGINATOR		*PROVIDER*	
Task Team - Maintenance			
QUALIFICATION TYPE	*FIELD*	*SUBFIELD*	
National Certificate	6 - Manufacturing, Engineering and Technology	Engineering and Related Design	
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUAL CLASS*
Undefined	124	Level 3	Regular-Unit Stds Based

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

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

The purpose of this Qualification is to equip learners with the standards and learning required to continue working and developing in various industries which use and maintain Diesel and Electric machines such as locomotives and motor coaches. It will also enable the further development of learners within this environment by providing articulation with higher level learning in this dynamic changing and challenging environment.

Qualifying learners will also be able to relate their learning to scientific and technological principles and concepts. They will also be able to maintain and support the various policies and procedures related to the safety, health, environment and quality systems that govern their workplace.

A learner acquiring this Qualification will be able to:

> Install and commission electrical equipment in a variety of diesel and electric machinery.
> Demonstrate the ability to test, fault find and maintain diesel and electric machinery.
> Demonstrate operational knowledge of mathematical, technological and theoretical concepts during the execution of tasks with an ability to read, interpret technical drawings, sketch electrical/electronic wiring diagrams for diesel and electric machinery.
> Apply health, safety and environmental procedures in order to comply with worksite and regulatory requirements.
> Demonstrate the ability to gather and interpret information from a range of sources and apply solutions to familiar problems related to working in the diesel and electric machinery environment with some scope for personal decision-making and responsibility.

The status and relevance of this Qualification will attract and retain quality learners and employees, and is the second step along a recognised and meaningful career path. Qualifying learners will be able to relate the tasks and processes to scientific and technological principles and concepts. They will also be able to maintain and support the various policies and procedures integral to safety, health and the environment. Learner achievements in this

Qualification will also serve as a basis for further learning to engage in more complex installation and maintenance activities and processes in the Diesel and Electric machines environment.

Rationale:

This is the second of a three-level Qualification series that reflect the workplace-based needs of the diesel electrical and electrical fitting sectors such as Locomotive and Motor Coach repair and maintenance, Millwrighting, etc. that is expressed by employers and employees. This Diesel Electrical Fitting and Electrical Fitting Qualification, provides the intermediate competencies required to work on both diesel electric and electric machines. This Qualification provides the learner with accessibility to be employed within various industries and provides the flexibility to pursue different careers across various industry sectors.

This Qualification provides learners with opportunities for professional development and career advancement within the diesel electrical and electrical fitting sectors such as Locomotive and Motor Coach repair and maintenance, Millwrighting, etc. Learners will be able to provide better and more efficient repair and maintenance services to their particular sector. It develops the fundamental competencies required by workers at an intermediate level. Qualifications at higher levels are designed to develop learners into fully fledged artisans, and are based on the learning in this Qualification.

The competencies in this Qualification are applicable to a wide range of industries. This Qualification is the second in a series for learners who want to follow a career in the field of diesel, diesel electric and electrical fitting. This Qualification focuses on developing the knowledge and skills and attitudes necessary to function at an intermediate level and also offers the opportunity for learners to apply what they have learnt in a range of specialised areas.

RECOGNIZE PREVIOUS LEARNING?
Y

LEARNING ASSUMED IN PLACE
> Mathematical Literacy at NQF Level 2.
> Communication NQF at NQF Level 2.
> Learners must first complete the National Certificate: Diesel Electrical Fitting, NQF Level 2 before accessing this Qualification.

Recognition of Prior Learning:

The Qualification can be achieved in whole or part through the Recognition of Prior Learning (RPL). Learners obtaining the whole Qualification through RPL and wishing to be declared competent are required to complete a practical assessment component for the purpose of such recognition. This implies that the Qualification may be granted to learners who have acquired the skills and knowledge without attending formal courses, providing they can demonstrate competence in the outcomes of the individual Unit Standards as required by the Fundamental, Core and Elective components stipulated in the Qualification and by the Exit Level Outcomes.

Learners submitting themselves for RPL should be thoroughly briefed prior to the assessment, and may be required to submit a Portfolio of Evidence (POE) in the prescribed format and/or undergo a workplace assessment to be assessed for formal recognition. While this is primarily a workplace-based Qualification, evidence from other areas of endeavour may be introduced if pertinent to any of the Exit Level Outcomes.

Access to the Qualification:

Access is open to all learners.

QUALIFICATION RULES
The Qualification is made up of a combination of learning outcomes from Fundamental, Core and Elective components, totalling a minimum of 124 Credits.

Fundamental component:

> All unit standards to the value of 36 credits are compulsory.

Core component:

> All unit standards to the value of 59 credits are compulsory.

Elective component:

> The Elective component consists of a number of Unit Standards from which learners are required to choose a combination totalling a minimum of 29 credits. However, learners wishing to qualify in a diesel electrical or electrical fitting trades in the locomotive sector are required to complete one of the following set of Elective Unit Standards:

Specialisation Area - Electrical Fitting (38 credits):

> ID 116882: Maintain and repair a bank of batteries as used in railway signalling (8 credits).
> ID 119235: Conduct dye penetrant testing (4 credits).
> ID 253375: Overhaul compressors (5 credits).
> ID 259187: Install and terminate medium voltage switch gear (6 credits).
> ID 10269: Maintain lighting system (4 credits).
> ID 113889: Perform work on energised low voltage networks (8 credits).
> ID 253396: Repair a vacuum pump (3 credits).

Thus 133 credits in total.

Specialisation Area: Diesel Electrical Fitting (29 credits):

> ID 259187: Install and terminate medium voltage switch gear (6 credits).
> ID 10269: Maintain lighting system (4 credits).
> ID 253376: Overhaul centrifugal pumps (7 credits).
> ID 253386: Overhaul positive displacement pumps (7 credits).
> ID 253357: Perform routine maintenance and inspections on diesel engines used for emergency plant operations (5 credits).

Thus 124 credits in total.

Additional specialisations for other sectors in which diesel, diesel electrical and electrical fitting that are applicable will be added to this Qualification once they are finalised.

EXIT LEVEL OUTCOMES
On achieving this Qualification, the learner will be able to:

1. Install and commission electrical equipment in a variety of diesel and electric machinery.

2. Demonstrate the ability to test, fault find and maintain diesel and electric machinery.

3. Demonstrate operational knowledge of mathematical, technological and theoretical concepts during the execution of tasks.

> Range: Demonstration includes reading, interpreting technical drawings and to sketch electric/electronic wiring diagrams for diesel and electric machinery.

4. Apply health, safety and environmental procedures in order to comply with worksite and regulatory requirements.

5. Demonstrate the ability to gather and interpret information from a range of sources and apply solutions to familiar problems related to working in the diesel and electric machinery environment with some scope for personal decision-making and responsibility.

ASSOCIATED ASSESSMENT CRITERIA

Associated Assessment Criteria for Exit Level Outcome 1:

1.1 Components and equipment relating to the installation of a variety of diesel and electric machinery are identified and installed according to specifications.
1.2 Components and equipment in a variety of diesel and electric machinery are connected according to diagrams.
1.3 Relevant control/protection devices are selected and applied according to safe operating parameters.
1.4 A variety of diesel and electric machinery installations are commissioned according to worksite and statutory requirements.

Associated Assessment Criteria for Exit Level Outcome 2:

2.1 Diesel and electric machinery to be worked on is isolated and secured according to worksite procedures.
2.2 Diesel and electric machine components are inspected for non-conformance according to worksite procedures.
2.3 Correct operation of equipment in diesel and electric machinery is tested and verified according to requirements.
2.4 Faults are identified and faulty equipment in diesel and electric machinery is maintained or replaced according to work procedures.
2.5 Diesel and electric machinery and installations are maintained and repaired according to work procedures.
2.6 Conditions in diesel and electric machinery are monitored and recorded according to work procedures.

Associated Assessment Criteria for Exit Level Outcome 3:

3.1 Principles of mechanical and electrical engineering are applied in the interpretation and problem solving of integrated electrical circuit drawings and diagrams.
3.2 The principles and operation of protection in mechanical and electric machinery are demonstrated in accordance with circuit and equipment specifications.

Associated Assessment Criteria for Exit Level Outcome 4:

4.1 Oral and written instructions are interpreted and carried out as required by relevant health, safety, environmental and electrical procedures.
4.2 Communication with superiors, peers and clients is conducted effectively according to industry procedures.
4.3 Knowledge of statutory requirements pertaining to the safe operation of diesel and electrical machinery is applied in accordance with relevant codes.
4.4 Relevant on-site health, safety and environmental requirements are demonstrated as required.

Associated Assessment Criteria for Exit Level Outcome 5: