Important Information related to the Annual SCSR Monitoring Programmes

1. Definitions and Acronyms

ATA

Approved Testing Authority: an organization accredited to perform functionality tests in terms of the South African National Accreditation System or approved by the Department of Mineral Resources and Energy for assessment of the structural integrity and functional performance of SCSRs.

Body-worn

Descriptive of an escape apparatus that is designed to be worn on the body for the duration of a complete working shift.

Chemical oxygen (KO2) escape apparatus

Escape apparatus that is so designed and constructed that air is exhaled via the face piece assembly or the mouthpiece assembly into a closed circuit that includes a cartridge containing chemicals which absorb both the exhaled carbon dioxide and the exhaled humidity. The chemical reaction releases oxygen into a breathing bag where it is available for rebreathing.

DMRE

Department of Mineral Resources and Energy

Long duration self-contained self-rescuer (LDSCSR)

SCSR that supplies oxygen for a minimum of 50 minutes at a ventilation rate of 35 litres per minute. The unit must provide oxygen instantly when activated, e.g. by chemical reaction or compressed oxygen starters, that may be used to escape from a place of safety to surface.

MHSA

Mine Health and Safety Act, 1996, Act 29 of 1996

MOHAC

Mining Occupational Health Advisory Committee of the Mine Health and Safety Council

NRCS

National Regulator of Compulsory Specifications

OEM

Original Equipment Manufacturer

Rated duration

Period that the escape apparatus complies with the functional performance requirements in accordance with SANS 1737, before and after durability tests. These tests are conducted on a breathing simulator at flow rates of 35 L/min and 50 L/min, at an ambient temperature of 21 °C ± 2 °C and at a barometric pressure of 85 kPa ± 5 kPa.

SABS

South African Bureau of Standards

Self-contained self-rescuer (SCSR)

Closed circuit respiratory protective device (RPD), which produces oxygen for a limited time, independent of the surrounding atmosphere, protecting the user by isolating the wearer from inhaling toxic gases during fires and gas leaks.

TTC

Tripartite Technical Committee with a mandate to advice MOHAC on requirements of Chapters 5 and 16 of the MHSA Regulations, with specific interest to Self-Contained Self Rescuers.

2. Regulation/Chapter 16.2, 16.3 and 16.4 (Self-Contained Self-Rescuers)

16.2 Issuing of Self-Contained Self-Rescuers

Coal Mines

16.2(1) The employer of every coal mine must ensure that no person goes underground a the mine without a body-worn self-contained self-rescuer, which complies with the South African Bureau of Standards specification SANS 1737.

Mines other than Coal Mines

16.2(2) If at any mine other than a coal mine the risk assessment in terms of Section 11 shows that there is a significant risk that employee's may be exposed to irrespirable atmospheres at any area at the mine, the employer must ensure that no person goes into such area without a body worn self-contained self-rescuer, which complies with the South African Bureau of Standards specification SANS 1737.

Sole Allocation of a Self-Contained Self-Rescuer

16.2(3) Anybody worn self-contained self-rescuer supplied to any employee employed in a full time capacity at the mine, in terms of sub regulations 16.2(1) and 16.2, must be allocated to the employee for that employee's sole use for the duration of the deployment of that self-contained self-rescuer at the mine or until that self-contained self-rescuer becomes defective and the employee is issued with another self-contained self-rescuer as required by these regulations.

16.3 No Defective Self-Contained Self-Rescuer is issued

Employer to ensure no defective self-contained self-rescuer is issued

16.3(1) The employer must ensure that no defective self-contained self-rescuer is issued for use to any employee at a mine.

16.4 Monitoring Programme

Annual testing of a Self-Contained Self-Rescuer

16.4(1) The employer must annually have a representative sample of self-contained self-rescuers at the mine tested by an organization accredited to do so in terms of the South African National Accreditation system for assessment of the structural integrity and functional performance.

Such representative sample must not be less than 1 % of the self-contained self-rescuers at the mine and must be representative of the age and deployment of the self-contained self-rescuers.

16.4(2) The employer must keep the following information, on self-contained self-rescuers at the mine, covering the preceding 24 months:

a) total number and makes of self-contained self-rescuers in service at the mine;

b) number and make of self-contained self-rescuers purchased by the mine in that period;

c) number and make of self-contained self-rescuers withdrawn from use by the mine in that period;

d) the number of shifts worked per day (1, 2 or 3);

e) number of self-contained self-rescuers in daily use (average for each month);

f) number of employees underground (average per shift);

g) number of spare self-contained self-rescuers available (average per month);

h) a tabulation of the type of defects found;

i) number of self-contained self-rescuers repaired/refurbished; and

j) number of self-contained self-rescuers tested in terms of regulation 16.4(1).

3. Definition of functional performance categories of Self-Contained Self-Rescuers (SCSRs) deployed in the South African mining industry.

Category I

Functional performance falls outside approval specification but with life-saving potential unimpaired.

Category II

- Functional performance exceeds rejection limits,

- Safe functional performance duration reduced by 50 per cent or more,

- Major material or structural faults, which would jeopardize survival if the SCSR were used in an escape mode.

The relevant approval levels for new units, and rejection levels for units which are deployed in the South African mining industry, are provided in the following table. In the absence of specific levels formulated to represent acceptable levels of functional performance (i.e. to accommodate the degeneration associated with daily deployment underground), the region between approval and rejection levels is deemed to satisfy the category 1 requirements.

Parameter	Approval Specification SANS 1737	Rejection Level
Inhalation oxygen concentration (minimum % by volume)	***21**	***21**
Inhalation carbon dioxide concentration (maximum % by volume)	**3,0**	**5**
Inhalation air temperature maximum dry bulb (degrees centigrade)	**65**	**75**
Inhalation breathing resistance (Pascal)	**800**	**1500**
Exhalation breathing resistance (Pascal)	**800**	**1500**

*A short-term deviation to a level of not less than 17 % by volume and for a period of not more than 2 minutes at the beginning of the test is permissible.

4. Compliance with SCSR control requirements

Compliance of mines participating in the Annual SCSR monitoring programme with accepted SCSR control measures in terms of lamp-room inspection procedures is assessed according to MHS Act Regulation 16.2 – 16.4 and categorized as follows:

a) Level 1 – mines with excellent SCSR control and infrastructures;

b) Level 2 – mines with sufficient SCSR control and infrastructures; and

c) Level 3 – mines with insufficient SCSR control and infrastructures.

Source: CSIR SCSR monitoring programme reports and the MHSA Regulations