

MINE ENVIRONMENTAL CONTROL

PAPER 6 OCTOBER 2021

MEMORANDUM

QUESTION 1

1.1 (MHSA S.102/Regulation 8.6)

Definitions

1.1.1 "Biological monitoring" means a planned programme of periodic collection and analysis of body fluid, tissues, excreta or exhaled air in order to detect and quantify the exposure to or absorption of any substance or organism.

1.1.2 "Employee" means any person who is employed or working at a mine.

1.1.3 "Health and safety committee" means a health and safety committee established in terms of section 34.

1.1.4 "Main fan" means a fan that controls the entire airflow of a mine, or the airflow of one or more of the major air circuits.

1.1.5 "Booster fan" means a fan installed underground in the main air stream or in a split of the main air stream to assist the main fan to increase airflow and/or overcome resistance through a section of a mine.

1.2 Reporting of explosions, fires and flooding.

(MHSA Reg.16.1 (1))

The employer must ensure that a competent person reports to the employer, at appropriate intervals determined in accordance with the mine's risk assessment, on the adequacy of escape and rescue procedures at the mine relating to explosions, fires and flooding.

1.3 Issuing of Self- Contained Self-rescuers.

1.3.1: (MHSA Reg.9.1)

(2) Where the risk assessment at the mine indicates a significant risk of a fire and/or explosion and/or toxic release, that could lead to an irrespirable atmosphere or an atmosphere immediately dangerous to life or health, the employer must provide an early warning system or systems at all working places.

1.3.2: (MHSA Reg.16.2 and 16.3)

1.3.2.1: 16.2 (1) Coal mines: The employer of every coal mine must ensure that no person goes underground at the mine without a body-worn self-contained self-rescuer, which complies with the South African Bureau of Standards specification SABS 1737.

1.3.2.2: 16.2 (2) Mines other than coal mines: 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 employees may be exposed to irrespirable atmosphere 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 SABS 1737..

1.3.2.3 :16.2 (3) Sole allocation of a self-contained self-rescuer: Any body-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(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.

1.3.2.4: 16.3: Employer to ensure no defective self-contained self-rescue is issued: The employer must ensure that no defective self-contained self-rescuer is issued for use to any employee at a mine.

1.4 Persons not to be exposed to fumes from a conveyor belt.

(MHSA Reg.8.9 (3)):

The employer must take reasonably practicable measures to prevent persons being exposed to flames, fumes or smoke arising from a conveyor belt installation catching fire, including instituting measures to prevent, detect and combat such fires.

QUESTION 2

2.1 Booster fans: Examination and record keeping

(MHSA Regulation 8.6 (4-6))

2.1.1 The employer must take reasonable measures to ensure that a competent person examines every main and booster fan for effective operation, internally and externally, together with all appurtenant components that are necessary for the operation of the fan, at intervals not exceeding three months, or any lesser interval determined by the Mine's hazard identification and risk assessment in terms of section 11.

2.1.2 The employer must keep record of all examinations conducted in terms of regulation 8.6 (4), including remedial actions taken, for a period of at least the most recent ten years of the fan installation.

2.2 Hearing conservation programme.

(MHSA regulation 9.2)

9.2 (2) (c): Noise - $\geq 82 \text{ dB}_{\text{Aeq, 8h}}$.

2.3 Medical exit procedure

Exit certificates - (MHSA S.17).

17 (1) : If an employee was subject to, or is was required to be subject to, medical surveillance in terms of this Act and such employees employment at the mine is terminated for any reason, the employer must arrange an exit medical examination of the employee.

17 (2): The examination referred to in subsection (1) must be held before, or within 30 days after termination of employment.

17 (3): The employee must attend the examination.

17 (4): The Occupational Medical Practitioner conducting the examination must:

- Produce an exit certificate with respect to that employee indicating the results of all medical surveillance and the presence or absence of any occupational disease.

- Enter a copy of the exit certificate into the employee's record of medical surveillance.
- MHSa Section 17 (1) – (4)

2.4 Second outlets

(MHSa Regulation 13.1)

- 3.1.1 13.1 (1): The employer must prevent employees from being trapped in any underground excavation by providing whenever practicable, from every underground working place, two exits, each of which is connected to separate means of egress to the surface.
- 3.1.2 13.1 (2): Where it is not practicable to provide two exits as contemplated in regulation 13.1(1) above, the employer must implement other reasonably practicable measures, determined by the mine's risk assessment, to prevent employees from being trapped in any underground excavation.
- 3.1.3 13.1 (3): Except in the case of emergency no person may enter or leave the underground workings of a mine except by means of ingress or egress especially provided or set apart for that purpose by the employer unless such person is authorised to do so by the employer.

2.5 Multi - blasting: minimum requirements

DMR guidance note for multi – blasting operations (Ref: 24/2/P)

- 2.5.1 Not less than $0.25\text{m}^3/\text{s}/\text{m}^2$ of face area.
- 2.5.2 Not less than twice more than the quantity of air supplied by the force column to the face area.
- 2.5.3 Not exceeding 30.0m from the face after the blast.
- 2.5.4 Not more than 20.0m from the face after the blast.
- 2.5.5 At least 10m and not exceeding 25m.
- 2.5.6 At least $0.4\text{m}^3/\text{s}/\text{m}^2$ of through ventilation.

QUESTION 3

3.1 SCSR monitoring Programme

(MHSA Regulation 16.4 (1-2))

3.1.1 16.4 (1) Annual testing of a self-contained self-rescuer : The employer must annually have a representative sample of the self-contained self-rescuers at the mine tested by an organisation 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.

3.1.2 16.4 (2) Record keeping: The employer must keep the following information, on self-contained self-rescuers at the mine, covering the preceding 24 months:

- (a) Total number and make 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.
- (j) Number of self-contained self-rescuers tested in terms of regulation 16.4(1).

3.2 Refuge Bays

(MHSA Regulation 16.6 (1, 3 and 4))

3.2.1 16.6(1): The employer of every underground mine must ensure that:

(a) Readily accessible refuge bays are provided in the underground workings of the mine, and

(b) Where a mine is required to have self-contained self-rescuers in terms of regulation 16.2, such refuge bays are located within the limits of protection afforded by the self-contained self-rescuers in use at the mine, when being used.

3.2.2 16.6(3) The employer must take reasonably practicable measures to ensure that every refuge bay is examined to ensure compliance with regulation 16.6(2) (a) to (l):

(a) At least once every 30 days by a person appointed in terms of regulation 2.15.1 or 2.17.1 in force in terms of item 4 of schedule 4 of the Act or any other employee of a higher ranking.

(b) At least once every 90 days by a person appointed in terms of section 12 of the Act, or by a person who holds the Intermediate Certificate in Mine Environmental Control issued by the Chamber of Mines of South Africa, working under the control of a person appointed in terms of section 12 of the Act.

3.2.3 16.6(4) The employer must take reasonably practicable measures to ensure that a written report on the inspection contemplated in regulation 16.6(3) (b) is provided within 7 days to the manager appointed in terms of section 3.1(a).

QUESTION 4

DMR Guideline for the compilation of a Mandatory Code of Practice for the prevention of flammable gas explosions in mines other than coal mines:

Ref DMRE 16/3/2/4-B5

Last revision date: 21 November 2019

Date first issued: 01 February 2002

Effective date: 01 May 2021

Part A

4.1 Objective of the guideline

The objective of this guideline is to assist the employer of every mine, other than a coal mine, to compile a code of practice, which, if properly implemented and complied with, would considerably reduce the risk of an ignition of flammable gas.

4.2 Definitions and acronyms

In this guideline for a COP or any amendment thereof, unless the context otherwise indicates: -

4.2.1 Explosion proof seal means a seal which is designed to withstand a static pressure of 140kpa.

4.2.2 Controlled recirculation means air from a working face or place which returns to the same working face or place under pre-determined conditions.

4.2.3 General atmosphere means any point outside a radius of 150mm away from the source or point of issue of flammable gas.

Part C

4.3 Aspects to be addressed in the COP

4.3.1 Detection of flammable gas

The COP must set out a procedure to detect flammable gas, which must deal with the following aspects:

1. Selection of appropriate flammable gas detection instruments for the typical operational conditions.
2. Availability for allocations, at any time, of a sufficient number of the flammable gas detection instruments referred to above.
3. Issuing of flammable gas detection instruments to employees on the mine.
4. Testing for and dealing with the presence of flammable gas.
5. Maintenance and calibration of flammable gas instruments.
6. Training and presence of competent persons for performing flammable gas detection measurements, inclusive of the correct selection, use and care of flammable gas detection instruments.

4.3.2 Clearing accumulation of flammable gas:

In order to ensure that the clearance of flammable gas accumulations, including roof layers, is done safely, the COP must set out a procedure for:

1. The dilution, removal and dispersion of flammable gas, including roof layering.
2. Isolating electricity without affecting the ventilation system where applicable.
3. Withdrawing of people from the return.

4.4 Approaching and holing into stopped areas:

In order to ensure that the approaching or holing into temporarily or permanent stopped areas is done safely, the COP must cover at least the following:

1. Procedures to ensure that warning notes are timeously issued by the surveyor when any workings approach any stopped area.
2. Stopping distances of workings approaching stopped areas.
3. Maximum excavation sizes for workings approaching any stopped area.
4. Procedure to probe for water and gas accumulations in any stopped area.
5. Procedure of re-establishing ventilation in any stopped area before and after holing.

