



**RWANDA  
STANDARD**

**DRS  
117-2**

First edition

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**Mining and quarrying — Health and safety**

**Part 2: General requirements**

ICS 73.020; 13.100

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Reference number

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## Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS 117-2 was prepared by Technical Committee RSB/TC 57, *Mining and related activities*.

In the preparation of this standard, reference was made to the following standard:

*MINING SAFETY STANDARDS* of March 2016 (Revised in December 2020). Rwanda Mines, Petroleum and Gas Board (RMB)

The assistance derived from the above source is hereby acknowledged with thanks.

RS 117 consists of the following parts, under the general title *Mining and quarrying*:

- *Part 1: Code of practice*
- *Part 2: General requirements*
- Part 3: Open pit mining
- Part 4: Underground mining
- Part 5: Blasting

## Committee membership

The following organizations were represented on the Technical Committee on *Mining and related activities* (RSB/TC 57) in the preparation of this standard.

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Integrated Polytechnic Regional College (IPRC) - Karongi

Inter-African Mining Corporation (IMC) Ltd

LuNa Smelter Ltd

New Bugarama Mining (NBM) Ltd

Ngali Mining Ltd

Ngororero Mining Company (NMC) Ltd

Piran Rwanda Ltd

Rutongo Mines Ltd

Rwanda Environment Management Authority (REMA)

Rwanda Extractive Industry Workers Union (REWU)

Rwanda Housing Authority (RHA)

Rwanda Mines, Petroleum and Gas Board (RMB)

Rwanda Quarries Association (RQA)

Standards for Sustainability (SfS)

Trinity Metals

University of Rwanda - School of Mining and Geology (UR - SMG)

Wolfram Mining and Processing (WMP) Ltd

Rwanda Standards Board (RSB) – Secretariat

## Introduction

Mining and quarrying sector implies health and safety management to prevent harm to workers at the site. This responsibility imposes duties and promotes excellent health and safety management by employers. The environmental issues, safety and human rights should be the major concern of employers during the whole process of mining and quarrying production.

The present standards on health and safety requirements for mines and quarries is designed to support the national mining law and includes other subjects that are not dealt with in the current law on mine and quarry operations and that may have an influence on mineral traceability, transparency, good practice and on the environmental impact of mining and quarrying operations for mineral certification system by an independent certifier based on the levels of compliance with the requirements provided in this document.

Copy for public comment

# Mining and quarrying — Health and safety — Part 2: General requirements

## 1 Scope

This Draft Rwanda Standard provides health and safety requirements and a framework for the management of hazards and risks associated with mining/quarrying activities, to enable mining companies to provide safe and healthy workplaces by preventing work-related injuries and ill-health for employees and neighbourhood as well as by proactively improving occupational health and safety (OH&S) performance.

This document applies to all mining activities such as quarries, open-pit/surface mining, underground mining and blasting activities.

Specific requirements for open pit/surface mining are covered in DRS 117-3, for underground mining, they are covered in DRS 117-4 whereas for blasting, they are covered in DRS 117-5.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3873, *Industrial safety helmets*

RS ISO 3941, *Classification of fires*

RS ISO 7010, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 16321-1, *Eye and face protection for occupational use — Part 1: General requirements*

ISO 19434, *Mining — Classification of mine accidents*

RS ISO 20347, *Personal protective equipment — Occupational footwear*

RS ISO 45001, *Occupational health and safety management systems — Requirements with guidance for use*

RS 109, *Water quality — Discharged industrial wastewater — Requirements*

RS 117-1, *Mining and quarrying — Part 1: Code of practice*

RS 236, *Acoustics — Noise pollution — Tolerance limits*

RS 237, *Vibration — Tolerance limits*

RS 354, *Occupational health and safety for non-food industry workers — Facility requirements*

RS 407-2, *Emission limits — Performance evaluation Part 2: Non-road mobile machinery*

RS EAS 751, *Air quality — Specification*

### **3 Terms and definitions**

For the purposes of this standard, the following terms and definitions apply.

#### **3.1**

##### **law**

national law regulating specified operations in Rwanda

Note 1 to entry: Example of national law includes the law regulating mining and quarry operations in Rwanda, and law regulating labour Rwanda.

#### **3.2**

##### **employer**

company or cooperative that employs workers at the mining site

#### **3.3**

##### **mine operator**

representative of the holder of the exploitation license

Note 1 to entry: An example of the mine operator could be the Director, Manager or Chief Executive Officer of the license holder

#### **3.4**

##### **hazard identification**

process of recognizing that a hazard exists and defining its characteristics

#### **3.5**

##### **hazard**

source or a situation with a potential for harm in terms of human injury, ill-health, damage to property, damage to the environment, or a combination of these

**3.6****harm**

that does not usually occur, or usually is not easily detectable, until a significant time after exposure to the hazard

**3.9****holder**

individual or institution in whose name a mining right is registered

**3.7****mine**

any place, quarry, pit, shaft, drive, level or other excavation, and any drift, gutter, lead, vein, lode, reef, saltpan or working, in or on or by means of which any operation connected with mining is carried on, together with all buildings, premises, erections and appliances, whether above or below the ground, that are used in connection with any such operation or for the extraction, treatment or preparation of any mineral or for the purpose of dressing mineral ores

**3.8****adit**

horizontal or nearly horizontal tunnel driven from the surface for the working of a mine

**3.9****mineral**

substance of economic value obtained by mining

[SOURCE ISO 22932-2:2020, 3.13.4]

**3.10****mining**

extraction of material, whether solid, liquid or gaseous from land or from beneath the surface of the earth in order to win minerals and includes any operations directly or indirectly necessary or incidental thereto

**3.11****mining area**

area of land subject to a mineral licence granted under the law regulating the issuance of mineral licence or mining licence

### **3.12**

#### **mining operations**

operations carried out in the course of mining

### **3.13**

#### **mining plant**

any building, plant, machinery equipment, tools or other property that has been used for mining, whether or not affixed to land, but does not include any timber or other material used or applied in the construction or support of any shaft, drive, gallery, terrace, race, dam or other work

### **3.14**

#### **mineral licence**

mining licence, quarry licence or an exploration licence, granted under the law

### **3.15**

#### **risk**

combination of the likelihood and consequences of a specified hazardous event occurring

### **3.16**

#### **risk assessment**

overall process of estimating the magnitude of risk and deciding whether or not the risk is tolerable or acceptable

### **3.17**

#### **barricade**

structure designed to prevent the entry of persons to an area

### **3.18**

#### **competent person**

person having the knowledge, experience, skill, and qualifications to carry out a particular task of supervision, drilling, blasting, plumbing, mining, electrical, civil and mechanical technician in mining as deemed as adequate by the competent authority upon assessment

Note 1 to entry: The qualifications and experience for competent persons shall be set by the competent authority.

**3.19****competent authority**

public institution responsible for implementing national standards, laws and regulations related to mining and quarrying operations

Note 1 to entry: Competent authority includes the authority in charge of mines and quarries, the authority in charge of environment management, the authority in charge of labour, investment or the local authority.

**3.20****machinery**

assembly of linked parts or components, at least one of which moves, with appropriate machine actuators, control and power circuits, joined together for a specific application, in particular for the processing, treatment, moving or packaging of a material

[SOURCE ISO 14159:2002, 3.13]

**3.21****incident**

unplanned event which results in damage or production loss but does not result in harm

**3.22****inspector**

personnel appointed by the competent authority in charge of mining and quarrying operations in Rwanda

**3.23****quarry**

any working open to the surface beneath the original surface for the purpose of extracting building or industrial minerals

**3.24****accident**

any unplanned event which results in harm

**3.25****ladder way**

part of any shaft, or raise where permanent ladders are installed for the use of persons travelling

Note 1 to entry: ladder includes a step ladder, a chain ladder, and extension ladder

### 3.26

#### **employer**

any physical or moral, public or private person that employs one or several workers, even in a discontinuous way

### 3.27

#### **worker**

any person who commits him/herself to put his/her professional activity in return for payment under the direction and authority of another physical or moral, public or private person

Note 1 to entry: worker includes employees, sub-contractors and artisanal miners

### 3.28

#### **inspector of labour**

person appointed as inspector of labour under the law governing labour in Rwanda

### 3.29

#### **employers' professional organization**

association of employers executing similar or related professions with the exclusive purpose of studying and defending their economic, and social interests

### 3.30

#### **workplace**

places where workers carry out their services, or where an employer carries out or directs two or several operations that are independent due to their size or mission. Each of these operations constitutes a separate workplace. A workplace may also be a place where one travels to or where the worker performs his/her functions while on mission

### 3.31

#### **mining area**

part of or whole mine where excavation operations are carried out or have been carried out previously

### 3.32

#### **child**

any human being below the legal age of work as defined in the Labour Law in Rwanda

**3.33****professional organization**

organization that aims at advancing a particular profession, support the interests of people working in that profession and serve the public good

Note 1 to entry: Professional organization can also be referred to as a professional association or professional body

**3.34****owner**

person holding a valid mining or quarry licence

Note 1 to entry: The owner can be an individual or an organization

**3.35****manager**

person directly appointed by the owner

Note 1 to entry: The owner can be the manager.

**3.36****employee**

person having agreed to work for an employer under a contract concluded between them, and in return for remuneration

**4 Management of mines and quarries****4.1 General**

The owner of mines and quarries shall ensure proper management of activities at sites in accordance with Clauses 4.2 and 4.3 of this standard.

**4.2 Management in mines and quarries****4.2.1 Competent authority**

**4.2.1.1** The competent authority shall ensure that mining works are carried out in way that does not contravene provisions of the laws on employees' health and safety and the environment.

**4.2.1.2** Persons authorized by the competent authority have rights to enter premises of operations for the purpose of monitoring the operations.

NOTE Persons authorized by the competent authority may include mines inspectors, labour inspectors, and other persons authorized by the competent authority such as the organizations in charge of mines and quarries, environment or labour in Rwanda.

#### **4.2.2 Mine/quarry owner**

**4.2.2.1** The owner of a mine or quarry shall have permit issued by the competent authority in order to begin mining/quarrying activities.

**4.2.2.2** The owner shall appoint a competent manager responsible for the management, control and direction of mines/quarries in accordance with the provisions of mining regulations.

**4.2.2.3** When the owner has the required competence, he/she can be responsible for the management, control and direction of mines/quarries activities.

**4.2.2.4** The competent authority in charge of mines and quarries shall define minimum competence of managers.

**4.2.2.5** Mining/quarrying or allied operations shall commence only if a manager has been appointed and is available at the mine/quarry.

**4.2.2.6** The appointment of a manager shall be documented and communicated immediately to the competent authority in charge of mines and quarries.

NOTE Documented appointment requires the appointment letter and job contract between the owner and the appointed manager.

**4.2.2.7** The owner shall ensure that there is a full-time, competent and responsible person(s) in charge of mining operations, environment, geology, and health and safety of employees. The competent authority may require the appointment of additional persons as deemed necessary.

**4.2.2.8** The owner may appoint assistant managers when deemed necessary to assist the principal manager. The requirements for the appointment of assistant managers shall be in accordance with paragraph 2 of 5.2.2 of this Standard.

**4.2.2.9** The owner shall ensure that each and every employee has documented appointment letter and job contract clearly defining his/her responsibilities.

**4.2.2.10** The owner shall provide required resources in order to comply with the requirements of this Standard and statutory and regulatory requirements.

NOTE 1 Statutory and regulatory requirements mean laws, ministerial orders, regulations, guidelines and other regulatory documents issued by the competent authority.

NOTE 2 Resources means financial, human and material resources

### 4.3 Responsibilities of managers

**4.3.1** The responsibilities of managers shall be clearly documented in the appointment letter and/or job contract.

**4.3.2** Whenever a Manager is absent from a mine, he/she shall appoint, in writing, a competent person to act as Manager during his/her absence. This shall be documented in accordance with Annex F and shall be communicated immediately to the competent authority.

**4.3.3** The acting manager shall, during the period of acting, be liable for undertaking all the responsibilities of the Manager.

**4.3.4** The manager shall:

a) enforce the requirements of this Standard, applicable statutory and regulatory requirements and other national standards related to mining and quarries. He/she shall ensure that they are observed by every person at the mine;

NOTE Example of other national standards related to mining and quarries include RS 117-1, RS 354, RS EAS 751, RS ISO 14001 and RS ISO 45001.

b) appoint competent persons as may be necessary to assist him to comply with and enforce observance of the requirements of Clause 4.3.4 (a) of this Standard;

c) take all necessary measures to provide for the safety and proper discipline of persons employed at the mine;

d) as soon as it is practicable after the occurrence of a breach of any requirements of this Standard:

(i) report such breach to the competent authority in charge of mines and quarries; and

(ii) take such other disciplinary steps as that the competent authority requires and, in any event cause particulars of such breach and of any disciplinary steps taken to be entered in a register kept for the purpose, which shall be open for inspection at all reasonable times by the Inspector;

(a) ensure that the times of the working shifts and of blasting operations in every section of the mine are so arranged that mine workers shall not be exposed to fumes and dust from blasting;

(b) ensure that there are required infrastructure waiting places as may be necessary for the use by mine workers prior to entering their working places and that they are at all times clearly marked.

(c)

(d) At all times, ensure that the “miner in charge” or blasting certificate holder who is responsible for the safety of these working places is the first person to enter such working places and all related approaches. However, this shall not be construed to mean that:

(i) the miner in charge or blasting certificate holder may not be accompanied into a working place by such assistants as are necessary to assist in making such working place safe; or

(ii) an official who is the holder of a blasting certificate may not in the execution of his duties enter a working place before the miner in charge or blasting certificate holder.

- (e) ensure that there is in force a system to enable determination of the number of persons in the underground workings at any time and that any person who knowingly fails to conform to the system is guilty of an offence;
- (f) not allow any miner or competent person to be placed in charge of a group(s) of workmen if, taking into account the nature or position of the working places, such miner or competent person is unable to efficiently supervise the workmen during his working shift in accordance with the requirements of the mining regulations;
- (g) not allow any miner to be in charge of many working places, equipment or persons than necessary and that may compromise health and safety of mine workers;
- (i) wherever necessary, provide and maintain in working order, both underground and on surface, adequate and standard fire-fighting equipment as directed in writing by the competent authority, which equipment shall be conveniently located and conspicuously marked;
- (h) ensure that each staff is trained as necessary before commencing work. The training and training plan shall be documented and kept at the mine;
- (i) on taking over a mine, acquaint himself with such notices as may have been issued to his predecessor(s) by the competent authority. The manager shall document any notices to the mine issued by a competent authority;
- (j) develop a system that ensures that when any person employed in the mine receives an injury by accident or otherwise, the same shall be reported to him without delay; and
- (k) ensure that all activities are documented and all copies are available at mine sites;
- (l) Submit quarterly report indicating the activities conducted and the plan of activities to be conducted considering the mine plan and provisions of the booklet of mining safety standards. Those reports shall be submitted to the competent authority not later than the last day of the month ending each quarter of the year.
- (m)

**4.3.5** The manager shall ensure that all plant, material and other things in the mine that are necessary for ensuring compliance with the mining health and safety regulations are provided and maintained in good order and repair.

**NOTE** The required documented information include mining/quarrying license, environmental impact assessment (EIA), production document, insurance document, mining/exploration reports, mining plans, environmental and social management plans, emergency preparedness and response plans, rehabilitation/reclamation plans, and book of accounts such as payment records.

#### **4.3.1 Responsibility of the mining engineer**

The mining engineer shall mainly:

- ascertain extraction risks;
- produce models or plans for mining sites;
- monitor and evaluate mining operations;
- ensure that operations comply with health and safety requirements of this Standard;
- ensure that the equipment used are safe; and
- ensure that mining activities are conducted in professional manner in accordance with approved mine design and mine plan that shall be available at site office.

#### **4.3.2 Responsibilities of an environmentalist**

The mine environmentalist shall:

- 1) ensure that a mining/quarry company is in compliance with environmental regulations and standards related to pollution and waste management
- 2) assess and manage the impact of mining operations on the natural environment and surrounding communities
- 3) implement environmental management plan (EMP) referring to environmental and social impact assessment conducted (ESIA),

#### 4.3.3 Responsibilities of employee

Each and every employee shall:

- a. take responsibility for ensuring own and workmates health and safety while at work;
- b. comply with lawful instructions given by the competent authority, and his/her employer or manager;
- c. take necessary steps to report hazards that employees are unable to control individually;
- d. refuse to undertake work under any unsafe practices;
- e. wear properly personal protective equipment (PPE) while at mine site and shall ensure their proper management;
- f. co-operate with the competent authority through providing information as requested;
- g. produce any account, survey, licence, statement, report or document required by the competent authority; and
- h. not knowingly provide or cause any other person to provide false information to the competent authority.

## 5 Hazard and risk management

The owner shall establish an occupational health and safety management system based on RS ISO 45001. Hazards and risks management shall be performed in accordance with Clause 9 of RS 1171-1. Annex E provides template with guidance on how to conduct hazard and risk management.

### 5.1 Tools and equipment checklist

**5.2.1** A checklist on the tools and equipment for making the working area safe shall be carried out on a daily basis. The following shall be checked:

- a) do personnel have appropriate PPE; and
- b) are required tools and equipment available.

NOTE Tools and equipment may include, among others, the following:

- a) first aid kits;
- b) mine signs;
- c) dust monitors;
- d) ventilators;

- e) breathing apparatus;
- f) air compressors;
- g) fire extinguishers;
- h) hazard detection devices (e.g.: proximity warning systems and gas detection units); and
- i) pinch bars of correct lengths which have guards fitted.

**5.2.2** The manager shall ensure that the tools and equipment are in good condition and are calibrated/verified by a competent authority.

## **5.2 Condition of mining site**

A checklist on the prevailing environment of the mine site shall be conducted in the area to ensure suitable condition for employees to see and/or hear signs of failing ground. The checklist shall also include:

- a) noise levels;
- b) ventilation of site;
- c) levels of dust;
- d) adequate water supply;
- e) availability of power supply; and
- f) visibility.

**NOTE** During conditions of poor visibility due to fog, employees shall wear high-visibility vests.

## **6 Personal protective equipment (PPEs)**

### **6.1 General**

**6.1.1** The mine owner shall provide personal protective safety equipment to all employees, contractors and visitors at all time and shall ensure that all people required to use the PPEs do so correctly and are maintained in good conditions.

**6.1.2** The basic PPEs shall include:

- a) safety helmet or hard hat to protect personnel against hazards of falling objects;
- b) protective gloves for work that might cause injury to the hands;

- c) suitable protective footwear to protect against danger of slipping or injury to the feet;
- d) safety goggles;
- e) respirator mask;
- f) ear muf; and
- g) protective vest.

## 6.2 Safety footwear

**6.2.1** Persons working and visiting mining operational areas that are marked as requiring safety footwear shall wear compliant safety footwear as per RS ISO 20347. The mine operators shall prescribe the operational areas where safety boots and shoes are compulsory.

**6.2.2** All safety boots and/or safety shoes shall comply with the specification for safety footwear in mines. The standard safety shoe shall have a hard sole to prevent penetration and a steel capping to protect the toes.

## 6.3 High visibility attire

Employees working in an underground and/or open pit environment where the operations involve the use of motorized machinery shall wear suitable high visibility attire and the machinery shall comply with emission requirements in accordance with RS 407-2.

## 6.4 Eyewear

**6.4.1** Persons working in or visiting mining operational areas that are marked as requiring the use of eye protection glasses shall wear compliant eye protection glasses and goggles.

**6.4.2** The manager shall prescribe the operational areas where the use of safety eyewear is compulsory. All safety eyewear or glasses shall comply with ISO 16321-1.

## 6.5 Safety helmet

**6.5.1** The use of safety helmets shall be compulsory where there is any risk of head injury. Mining operators shall clearly prescribe operational areas and shall clearly mark out the areas where the use of hard hats is compulsory.

**6.5.2** No person shall enter or remain in the operational area in any of the following places unless that person wears a safety helmet:

- a) underground;
- b) any open pit susceptible to cause head injury;

c) any other place which the manager has designated as safety helmet area.

**6.5.3** All safety helmets shall comply with ISO 3873 and shall allow a provision for use of earmuffs and have a provision for holding a lighting cap.

## **6.6 Clothing**

The mine operator shall provide clothing for use at mining operations. Cotton overalls or work suits shall be the normal work wear in mines. Strips of reflective material shall be added to make the miner more visible to drivers in case of motorized operations involving underground vehicles or to any other employee working underground.

## **6.7 Ear protection**

**7.7.1** Where the noise exceeds permissible level as per RS 236 the manager shall provide persons working in or visiting mining operational areas with suitable protective hearing devices including muffs or ear plugs.

**7.7.2** The manager shall prescribe the operational areas where the use of safety ear protection wear is compulsory.

## **6.8 Safety harness**

**6.8.1** Any person working in a place where he/she may fall more than two metres shall be provided with and wear a safety belt or harness which shall be securely attached to the wearer and to a safe anchorage.

**6.8.2** Where the lanyard of the safety belt or harness is too short for use when attached to the safe anchorage, an anchor chain shall be attached to the safe anchorage and the lanyard shall be securely attached to the chain.

**6.8.2** Where more than one person is attached to a safe anchorage, the strength of the anchorage shall be increased in proportion to the number of persons attached to it.

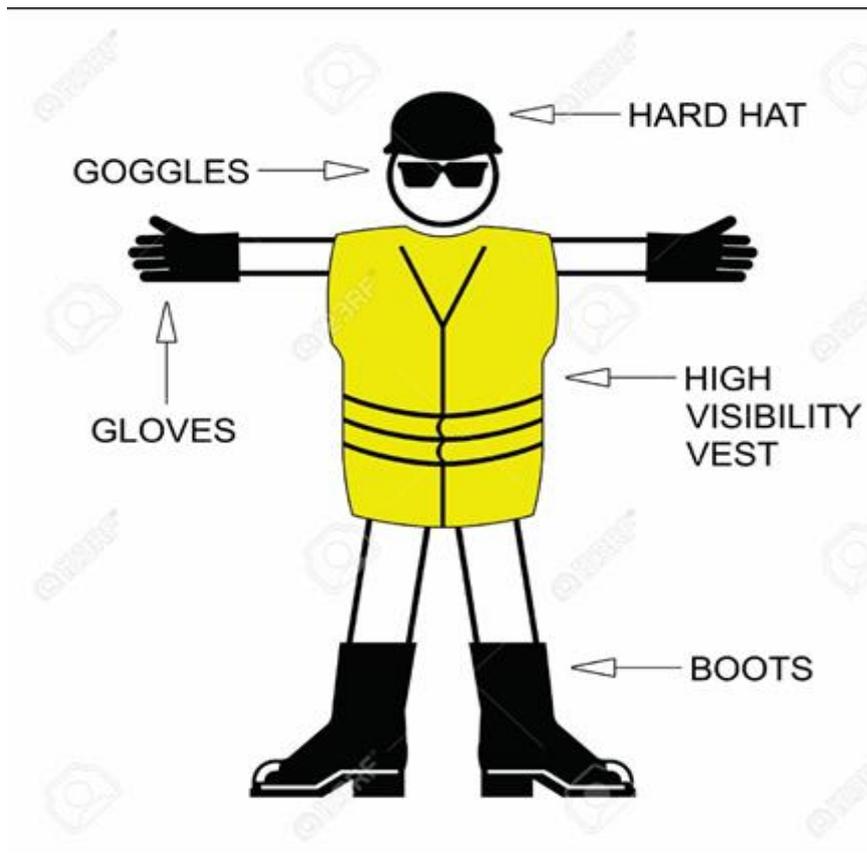


Figure 1 — Illustration of PPE

### 6.9 Display of mandatory signs of PPE

It shall be mandatory for the mine operator to display PPE wear signage as displayed in Fig 5 and 6.



Figure 2 — Mandatory requirements

## **7 Health of employees**

### **7.1 Insurance of employees**

Prior to the commencement of work, the owner shall ensure that each and every employee has insurance for health and accidents.

### **7.2 Noise level surveys**

**7.2.1** Noise surveys shall be conducted and the noise levels shall be measured in areas where noise exposure is likely to be hazardous throughout an entire plant or in workplaces underground to identify noisy areas.

**7.2.2** The noise survey shall identify:

- a) areas where employees are likely to be exposed to harmful levels of noise and PPE may be needed;
- b) machines and equipment which generate harmful levels of noise;
- c) employees who might be exposed to unacceptable noise levels.

### **7.3 Temperatures**

**7.3.1** Managers shall ensure that measures and precautions are implemented to protect employees from heat at mine sites.

**7.3.2** Managers and supervisors shall ensure that the safety and occupational health needs of people working at the mine are appropriately monitored and workplace temperature hazards are detected.

**7.3.3** Mine operators shall:

- a) appoint trained staff to measure the appropriate heat stress index and monitor employees for heat illness;
- b) establish cool rest areas that have cold drinking water and are close to “hot” work sites;
- c) provide suitable canopies, cabins or clothing to protect staff from direct sunlight in above-ground mines.

### **7.4 Symptoms and treatment**

#### **7.4.1 Heat exhaustion**

The symptoms of heat exhaustion are headaches, dizziness, light headedness, weakness, mood changes, (that is, feeling irritable or confused), vomiting, decreased and dark coloured urine, fainting and pale clammy skin. If heat exhaustion is not treated, the illness may advance to a heat stroke.

### 7.4.2 Heat stroke

The symptoms of heat stroke are dry pale skin (no sweating), hot red skin (looks like a sunburn), mood changes, (that is, feeling irritable or confused), seizures, fits, collapse and unconsciousness.

### 7.4.3 Treatment

All cases of heat illness shall be taken seriously as there is a high risk of death resulting from lack of treatment. Medical attention shall be sought as soon as possible. All cases of heat stroke shall be treated as an emergency and the patient taken to hospital.

## 7.5 Dust control

### 7.5.1 General

Appropriate Personal Protection Equipment shall be used where dust particles concentration of size ranging from 0.001 to 0.1 mm (1 to 100 µms) are encountered airborne to prevent reducing visibility, irritation of eyes, ears, nose, throat and skin and damage to the tissues of the lungs.

### 7.5.2 Dust control methods

**7.5.2.1** The strategy to control dust shall include the establishment of a dust control programme for the purpose of:

- a) monitoring and analyses of airborne dust within the limits specified as per Table 4.

**Table 1 — Permissible limits of particulate matter**

PM 2.5		PM 10	
Annual average	24-hour average	Annual average	24-hour average
Shall not exceed 5 µg/m <sup>3</sup>	Shall not exceed 15 µg/m <sup>3</sup>	Shall not exceed 15 µg/m <sup>3</sup>	Shall not exceed 45 µg/m <sup>3</sup>
<p>NOTE 1 Annual average concentration of PM<sub>2.5</sub> should not exceed 5 µg/m<sup>3</sup>, while 24-hour average exposures should not exceed 15 µg/m<sup>3</sup> more than 3 - 4 days per year.</p> <p>NOTE 2 PM<sub>10</sub> (particulate matter with a diameter of 10 microns or less) concentrations of 15 µg/m<sup>3</sup> annual mean, 45 µg/m<sup>3</sup> 24-hour mean.</p>			

- b) implementation of corrective action to control generation of dust;
- c) limit employee exposure to dust, where required; and
- d) personal exposure records.

**7.5.2.2** The methods by which dust in working places is controlled include the following:

- a) wet drilling and water mist drilling;
- b) proper ventilation of working places, particularly dead ends (for example, by supplying dust-free air to the face);
- c) wetting muck piles when moving broken rock, loading trucks or dumping into bins or stockpiles;
- d) use of wetting agents with water in selected processes; and
- e) use of total wet processes in crushing and screening plants.

### **7.5.3 Medical examination**

**7.5.3.1** Medical checkups shall be done in accordance with relevant instructions from the competent authority.

**7.5.3.2** Employees working physically in diggings, underground transportation, blasting, drilling, processing shall present a medical certificate of fitness before the first day of work.

**7.5.3.3** Medical examinations shall be conducted on all employees on the following tests:

- a) hearing;
- b) blood pressure;
- c) vision;
- d) lung (Breathing); and
- e) communicable diseases (e.g.: tuberculosis, etc.).

**7.5.3.4** other tests can be done depending on operations undertaken or as may be recommended by the competent authority

**7.5.3.5** Regular check-ups shall be done once a year or whenever a competent authority deems it necessary.

**7.5.3.6** Medical examinations shall be documented and presented to the competent authority when required.

**NOTE** Relevant instructions from the competent authority refer to instructions on occupational safety issued by relevant authority such as listed in Bibliography (v).

## 7.6 Vibrations control

### 7.6.1 General

**7.6.1.1** Workers operating handheld machinery, especially pneumatic rock drills and pick hammers, even for one hour a day, can suffer from the effects of vibration in their hands and arms.

**7.6.1.2** Vibration White Finger (VWF) or “dead finger” starts when the fingers become numb.

**7.6.1.3** VWF can lead to Gangrene, which is the death of tissues which often occurs in the extremities or skin from loss of blood supply.

**7.6.1.4** Regular exposure to vibrating tools can cause damage to your hand's nerves, joints and blood vessels, making it more difficult for blood to pump to your fingertips.

**7.6.1.5** Symptoms include discoloured skin, severe pain followed by numbness and foul discharge.

**7.6.1.6** There is no cure for Vibration White Finger.

**7.6.1.7** Employees shall not be exposed to vibrations exceeding the tolerance limits specified in RS 237.

**7.6.7.8** Safety procedures and instructions shall be documented and communicated to employees regularly.

### 7.6.2 Prevention and control of vibration

**7.6.2.1** Avoid long periods using handheld vibrating equipment. Work in short bursts, e.g.: Take regular breaks of at least 10 min every hour away from the tool.

**7.6.2.2** Use modern, vibration-dampened equipment.

**7.6.2.3** Repair or replace old equipment or fit anti-vibration handles.

**7.6.2.4** Grip handles as lightly as possible.

**7.6.2.5** Support heavy tools so that a lighter grip can be used.

**7.6.2.6** Maintain vibrating tools to minimize vibration levels.

**7.6.2.7** Store tools so that they do not have very cold handles when next used.

## **8 Mine facilities**

### **8.1 Location of offices, first aid facilities and parking**

**8.1.1** All offices, first aid room and parking facilities shall be located outside the operational area and shall be easily accessible.

**8.1.2** It shall be a requirement for a site manager to set up suitable facilities at the mine site.

### **8.2 Hygienic facilities**

Hygienic facilities shall be provided to the mining site and shall take into consideration special needs for males and females. Hygienic facilities shall include but not limited to the following:

- a) toilets (latrines);
- b) washrooms;
- c) handwashing facilities; and
- d) changing rooms.

### **8.3 First aid room records**

**8.3.1** Every mine site shall have a first aid room and there shall be sufficient first aid kits.

**8.3.2** Every mine site shall have trained personnel on the use of first aid kit.

**8.3.3** Requirements for the first aid facility are laid out in Annex A.

**8.3.4** The following book particulars shall be recorded in accordance with ISO 19434:

- a) case treated, stating the name of the injured or sick person;
- b) the nature of the injury or illness;
- c) the treatment given;
- d) the name of the person administering the treatment and the date; and
- e) time of the treatment.

## 9 Reporting of incidents and accidents

### 9.1 Incident reporting

9.1.1 All injuries, no matter how slight, shall be reported immediately to the responsible mine official.

9.1.2 An incident report form shall be completed and taken, with the injured person to the health Centre/clinic/hospital and a copy of incident report kept.

9.1.3 The incident report form is as set out in Annex D.

9.1.4 A preliminary report form shall be completed within 24 h of the incident happening and communicated to the competent authority.

9.1.5 A final investigation report shall be conducted and report sent to the competent authority within 48 h.

### 9.2 Registration of incidents and accidents

9.2.1 The mine manager is required to maintain a register of any accident, dangerous occurrences (incidents) and diseases. The register shall avail to the inspector of the competent authority and its extracts shall form a report to the competent authority.

9.2.2 When any employee contracts a disease listed as notifiable by the relevant competent authority (e.g.: Ministry of Health, Ministry of Labour, etc.), the manager shall immediately notify such cases to the competent authority.

### 9.3 Reportable accidents and incidents

9.3.1 The following accidents shall be immediately reported to the competent authority:

- a) involving death of a person;
- b) in which any person becomes unconscious or is admitted in a hospital; and
- c) accident in which the injuries sustained by any person could lead to permanent disability.

9.3.2 The presumed cause of accident shall accompany the notification to form the basis of further investigation of the real cause of the accident.

9.3.3 The following types of incidents occurring at the mine site shall be notified immediately and reported to the competent authority within 24 h of occurrence:

- a) any accident due to explosives including an accidental ignition or detonation of explosives;
- b) the flooding of any considerable portion of the workings or the failure of any dam or reservoir used for conserving water or slimes;

- c) any accidental explosion or large fire due to the ignition of dust, gas, oil or vapour;
- d) any accidental fire underground or accidental large fire on the surface;
- e) any electrical shock or burns to a person who consequently receives medical treatment;
- f) the extensive caving of any underground working or any extensive subsidence of any ground which is not normal for the method of mining in practice;
- g) any prolonged failure of the main ventilation system or part of it; and
- h) the reports shall be made out in the reporting format set out in the Annex C.

#### **9.4 Analysis and classification of incidents/accidents**

Incidents and accidents shall be classified in accordance with ISO 19434.

### **10 Machinery isolation procedures**

#### **10.1 Isolation procedures**

**10.1.1** The isolation procedures shall be a systematic way of identifying the sources of energy that, if uncontrolled, could cause injury; and controlling the activation of that energy source by other people.

**10.1.2** The procedure shall be done as follows:

**Step 1** – Identify all equipment to be isolated confirm that the switches, valves, chains, locking pins and other devices to be used to isolate the system are the correct ones as per example in Figure 9.

**Step 2** – Determine the correct point of isolation. Positive isolation can only be achieved by isolating the sources of energy from the equipment to be worked on. Use main switches, circuit breakers, de-contactors, valves, locking devices for isolation. Do not use push button, conveyor lanyard switches, control circuit devices.

**Step 3** – Carry out the isolation.

**Step 4** – Test the effectiveness of the isolation.

**Step 5** – Place safety lock/tag(s) on isolating device(s).



Figure 3 — An example of isolation: isolated switch

## 11 Tailings Storage Facility (TSF)

### 11.1 Storage of tailings

The selection of the tailings storage facility (TSF) shall offer the safety, long term storage of tailings with minimal environmental impact.

### 11.2 Design and operating requirements of a TSF

**11.2.1** The design and construction of a TSF shall be in accordance with applicable standards. It shall be undertaken and supervised by suitably experienced personnel.

**11.2.2** In the operational phase, an inspection and audit by competent engineer shall be done every six months.

**11.2.3** A plan for rehabilitation and decommissioning of TSF shall be made by a competent engineer and maintained at site by the Mine Manager.

**11.2.4** The Mine Manager shall ensure that the mine has developed Emergency Response Action Plan on the TSF.

**11.2.5** Records on periodic internal inspection of TSF shall be maintained at the mine site.

## 12 Emergency response preparedness (ERP) procedures

An ERP shall include:

- a) engineering controls (such as containment, automatic alarms, and shutoff systems) proportionate to the nature and scale of the hazard;

- b) identification and secure access to emergency equipment available on-site and nearby;
- c) notification procedures for designated emergency responders;
- d) diverse media channels for notification of the affected community and other stakeholders;
- e) a training programme for emergency responders including drills at regular intervals;
- f) public evacuation procedures;
- g) designated coordinator for ERP implementation; and
- h) measures for restoration and clean-up of the environment following any major accident.

### 12.1 Emergency evacuation signage

Personnel shall look out for signs that shall be standard as per Figure 10. Other safety signs can be used as appropriate. RS ISO 7010 gives more examples of registered safety signs.



**E001**



**E001**

Emergency exit  
(left hand)

Emergency exit  
(left hand)



**E007**

Evacuation  
assembly point



**E004**

Emergency  
telephone

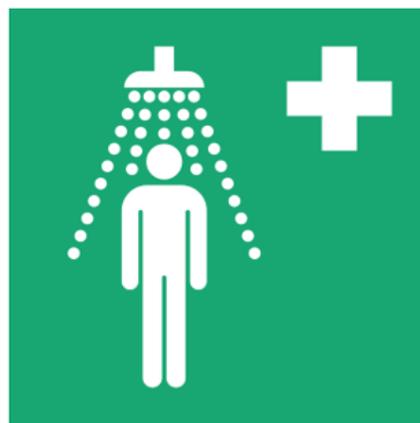
**Figure 4 — Example safety signs for emergency evacuation**

## 12.2 Workers exposed to chemicals

At site where workers are likely to be exposed to chemicals, clear signs shall be in place. Figure 11 gives example signs as per RS ISO 7010.



To signify that protective clothing must be worn



To indicate the location of a safety shower



To signify that protective gloves must be worn



To signify that safety footwear must be worn

Figure 11 — Example of safety signs for areas where workers are likely to be exposed to chemicals

## 12.3 Firefighting equipment

In case of fire, personnel shall look for fire extinguishing equipment. Annex B gives guidance on firefighting and classification of fires.

## 12.4 Medical emergency signs

The following sign shall be used for medical emergency. The CROSS indicates the First Aid Box and an arrow can be used to indicate the location of the FIRST AID box/station.



**To indicate the location of first aid equipment or facilities or staff**

**Figure 12 — Example safety sign for medical emergency location**

### **13 Mine security and access control**

- 13.1** All visitors and employees at mine site shall be recorded upon arrival.
- 13.2** Only authorized vehicles are allowed access to the mine.
- 13.3** All persons shall stay clear from “No-Entry Zones” unless entry is authorized.
- 13.4** Alcohol and drug are prohibited at mine site.
- 13.5** Any person present at mining site shall not be under influence of drugs and alcohol.

#### **13.1 Mandatory signs to be observed**

Specific signs that are required to be observed at a mine site shall be placed at visible places at the mines and shall be observed at all times by employees and visitors. Figure 13 gives example of signs that can be mandatory at a mine site.

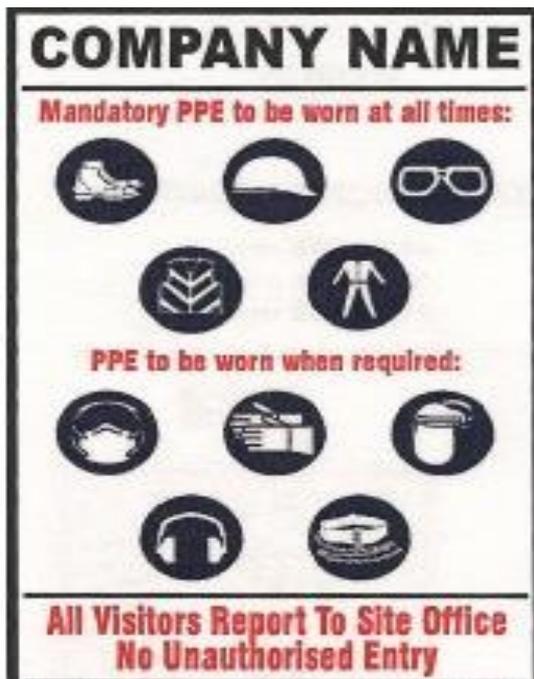


Figure 13 — Example of signs that can be mandatory at a mine site.

### 13.2 Signs to prohibit alcohol and drugs at mines

Specific signs shall be placed at a mine site to inform that alcohol and drugs are prohibited at a mine site. Figure 14 gives example of signs that can be used.



Figure 14 — Example of signs to be placed at a mine site to prohibit use of alcohol and drugs

### 13.3 Management of wastewater

13.3.1 Wastewater resulting from mining activities shall meet the requirements of RS 109 prior its disposal into the environment.

13.3.2 Records of quality of wastewater discharges shall be documented and availed during the inspection.

NOTE Whenever deemed necessary, competent authority has the right to require a third party verification of wastewater quality.

## **13.4 Artisanal traditional processing of minerals**

**13.4.1** A mine manager shall develop a plan of replacement of ground sluicing methods with appropriate technology to minimize loss of minerals and prevent damage to the environment.

**13.4.2** The use of chemicals in mineral processing shall be prohibited.

**13.4.3** The mine manager shall ensure that the environmental safety measures are in place for:

- a) water conservation;
- b) erosion prevention;
- c) preventing contamination;
- d) disposal of solid waste products; and
- e) preventing siltation of streams.

**13.4.4** The mine manager shall ensure that persons involved in ground sluicing operations are provided with appropriate PPEs.

**13.4.5** Tailings from the processing shall be stored in a properly constructed embankment and tailings dam.

## **13.5 Standard Operating Procedures for mechanized minerals beneficiation**

**13.5.1** Manager shall develop equipment operating procedure based on the user and operational manuals of the original equipment manufacturer.

**13.5.2** The procedure shall include use and safe operation of the processing equipment, movements, safety precautions around the operational areas, maintenance, lockout, hazard identification and responsibility.

## **14 Community living in proximity of operations**

### **14.1 Community relations**

**14.1.1** Before the start of operations, the owner shall meet applicable statutory and regulatory requirements.

**14.1.2** The owner shall conduct environmental and social impact assessment (ESIA); where ESIA certificates and its conditions of approval require the land acquisition. The mining/quarrying operations shall start only if affected people have been expropriated/relocated.

**14.1.3** In case the environmental and social audits of mining/quarrying operations reveal that ongoing mining operations have impact that requires relocation of affected local community, mining/quarrying activities shall resume only after relocating/expropriating affected community.

**14.1.4** The owner shall develop and respect the provisions of Corporate Social Responsibilities (CSR) and keep records of its implementation.

## **14.2 Protection of people against mine health hazards**

**14.2.1** The owner shall take reasonable steps to protect persons living in the mining areas against health hazards including dust, water contamination and erosion, as a result of operations and noise pollution.

**14.2.2** The mine shall put in place periodic monitoring of the environment through collection and analysis of samples.

## **14.3 Keeping mining operational areas secure**

**14.3.1** The Mine manager shall ensure that the operational areas of the mine are well secured to avoid entry by people living in the vicinity of the mines.

**14.3.2** Warning signs shall be displayed to caution people.

**14.3.3** Mine vehicles and equipment shall be operated in a safe manner ensuring the safety of persons living in mining areas.

**14.3.4** Sites, that is, shafts and tunnels at the mine that for some reason are closed off and not in use shall be protected and barricaded with proper signage "**DANGER, NO ENTRY**".

**14.3.5** Where an excavation into which a person may fall, is made, the material excavated shall be used to form a regular ridge around the boundary of the excavation.

## **14.4 Protection against subsidence and caving**

**14.4.1** Where any mining operation has caused or is likely to cause any crack, subsidence or cavity on the surface in any area, the whole of the area shall be kept fenced with appropriate sign to be placed warning people of possibility of subsidence.

**14.4.2** The Mine manager shall take steps to ensure that there is a designed safety pillars to protect surface installations, dwellings on top of mine workings.

**14.4.3** No mining operation shall take place when it is likely to cause any crack, subsidence or cavity on the surface within a horizontal distance of 50 m from any building, road, railway, lake, river, tailings dump or any other structure or feature on the surface requiring protection.

**14.4.4** No person shall erect or construct a building, road or railway within 50 m from the caving areas.

## **14.5 Policies**

**14.5.1** An operating mine shall develop a policy on Environmental Management and Occupational Health and Safety.

**14.5.2** Employees shall be trained on the above policies and shall be documented.

NOTE The competent authority may require the development of other policies on safety, health and environment and standard operation procedures in order to enhance the implementation of best mining practices.

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## Annex A (normative)

### Items to be kept in first-aid

**A.1** The following items are to be kept and maintained in first-aid boxes whose standard dimensions shall be, length 63.5 cm, width 38 cm and height 12.5 cm, and are a minimum requirement.

#### Splints

Eight splints with metal junctions.

Two rectangular splints for injuries to elbow, forearm, wrist and hand (Recommended size 500 mm X 230 mm X 75 mm).

#### Tourniquets

Two rubber tourniquets, one for the upper limbs and one for the lower limbs.

Two tourniquet "twisting sticks", one 150 mm long, one 230 mm long.

#### Bandages

The following shall be available:

- a) Eighteen triangular bandages.
- b) Twelve sterilized small first aid packets "finger dressing" size.
- c) Eight sterilized medium first aid packets "first field dressing" size.
- d) Four sterilized large first aid packets "shell dressing" size.
- e) Each packet of above dressing to be in waterproof cover with rolled bandage lightly stitched on at back of dressing of gauze and wool 500g tow.
- f) 250g packet cotton wool.
- g) Twelve assorted safety pins.
- h) Four 30 g packets white lint.
- i) One 60 ml bottle labelled "Antiseptic - Poison - For External Use Only".
- j) Eye drops, one 30 ml dropper bottle sterile liquid paraffin.
- k) One small pair of scissors.

The whole of the above splints, tourniquets, bandages and dressings shall be packed in a strong metal box fitted with leather straps and a handle.

## **Annex B** **(normative)**

### **Fire-fighting**

#### **B.1 General**

**B.1.1** Suitable fire-fighting equipment means a fully equipped fire-fighting unit capable of extinguishing every type of fire, or where this is not possible or unduly onerous, adequate provision of supplies of water, suitable fire-extinguishers or containers filled with sand or inert dust at places where they are adequate and suitable for the fire risk involved.

NOTE "Adequate supplies of water" means water sufficient in quantity, supplied at a pressure not less than 3.5 bars, at a rate of not less than 270 l/min through pipes, hoses and hydrants.

**B.1.2** For the purposes of this Standard, fires are classified in accordance with RS ISO 3941 where:

#### **Class "A"**

These are fires involving solid materials normally of an organic nature (compounds of carbon), in which combustion generally occurs with the formation of glowing embers.

Water in the form of a jet or spray or such other agents as the Mine Manager may in writing approve, may be used as suitable fire-extinguishing agents.

#### **Class "B"**

These are fires involving liquids or liquefiable solids. For the purpose of choosing effective extinguishing agents inflammable liquids may be divided into two groups:

- a) those that are miscible with water; and
- b) those that are not miscible with water.

Where the fire falls under B a), the extinguishing agents include water spray, foam, and vaporising liquids; and where the fire falls under B b), the extinguishing agents are vaporising liquids, carbon dioxide and dry chemical powders and such other agents as the Mine Manager may approve in writing.

#### **Class "C"**

These are fires involving gases or liquefied gases in the form of a liquid or gas leak or liquid spillage and these include methane, propane, butane. Foam or dry chemical powder can be used to control fires involving liquid spills and gas leaks. Water, in the form of spray, may only be used to cool the containers.

#### **Class "D"**

These are fires involving metals. Extinguishing agents containing water are ineffective and even dangerous; carbon dioxide and the bicarbonate classes of dry chemical powders may also be hazardous if applied to most metal fires. Powdered graphite, powdered talc, soda ash, limestone and dry sand are normally suitable for Class 'D' fires. Special fusing powders may also be used for fires involving some metals, especially those which are radioactive.

**Electrical fires**

**B.2.1** It is not considered, according to present-day ideas, that electrical fires constitute a class, since any fire involving, or started by, electrical equipment shall in fact, be a fire of Class A, Class B or Class D. The normal procedure in such circumstances is to isolate the electricity and use an extinguishing method appropriate to the substance which is burning. Only when this cannot be done with certainty shall special extinguishing agents be required which are non-conductors of electricity and non-damaging to equipment; these are vaporising liquids, dry powders and carbon dioxide and such other agents as the Mine Manager may in writing approve, although the cooling and condensation effects of carbon dioxide may affect sensitive electronic equipment.

**B.2.2** Suitable fire-extinguisher means, a fire-extinguisher designed for use on a fire in its earliest stage and not expected to be effective after a fire has reached large dimensions. Fire-extinguishers differ and each type is limited in application to certain kinds of fire. It is essential that the correct type of fire-extinguisher is used depending on the nature of the source of the fire, according to the international classification of fires quoted.

**B.2.3** A competent person, fully trained and experienced in fire-fighting, shall decide upon the correct type and size of fire-extinguisher to be located at places where an extinguisher is required to be provided according to the relevant regulations.

**B.2.4** Fire-extinguishers shall be carefully maintained to ensure instant readiness when required

(normative)

Preliminary report from preliminary incident report

Subject:

Incident Date:		Mine:	
Incident Time:		Manager:	

1. Description of Incident (with Photos if possible):

.....

.....

.....

2. Immediate Causes Identified:

.....  
.....

3. Key Learning's:

.....  
.....

4. Corrective Actions:

.....  
.....

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**Annex C**  
(normative)

**Accident report form**

This form shall be completed for reportable accidents in terms of regulations and dangerous occurrences

SECTION 1: EMPLOYER DETAILS

1. NAME OF OPERATOR: .....
2. NAME OF MINE SITE:
3. DISTRICT:
4. MINERAL(S) MINED:

SECTION B: ACCIDENT OR DANGEROUS OCCURRENCE DETAILS

1. Mine accident or number.....
2. Number of persons killed.....
3. Number of persons totally disabled.....
4. Number of persons injured .....
5. Date of accident or dangerous occurrence
6. Time of accident or dangerous occurrence
7. Location of accident or dangerous occurrence
8. Name of working place
9. Depth below surface (in metres)
10. Description of accident or dangerous occurrence in words

.....  
.....

11. Did accident or dangerous occurrence occur during normal working hours or overtime?

Normal

Overtime

12. Did accident or happen at normal workplace?

Yes

No

Section C: Responsible persons

NAME	IDENTITY NUMBER	OCCUPATION
.....	.....	.....
Name of Manager/Technician	Signature	Date
.....	.....	.....

**SECTION 2: FOR USE BY THE REGULATION AND INSPECTION UNIT**

1. ACCIDENT OR DANGEROUS OCCURRENCE NUMBER.....

2. DATE REPORTED .....

3. TYPE OF ACCIDENT OR DANGEROUS OCCURRENCE

4. PROBABLE CAUSE OF ACCIDENT OR DANGEROUS OCCURRENCE

5. CONTRAVENTION IN INSPECTOR'S OPINION

6. IF YES, ACT/STANDARD CONTRAVENED

7. ACTION RECOMMENDED

8. DATE EVALUATION FORM COMPLETED

9. INSPECTORATE DETAILS: NAME (IN BLOCK LETTERS)

DATE

SIGNATURE

10. MINE INSPECTOR:

11 DIRECTOR REGULATION AND INSPECTION:

12. ARE CRIMINAL PROCEEDINGS ENVISAGED?  YES  NO

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## Annex D (normative)

### Template with guidance on how to conduct hazard and risk management

Company logo

**Table D.1 — Risk Assessment — Hierarchy of controls**

Elimination	The most satisfactory method of dealing with hazards is to get rid of them. Once a hazard has been eliminated, the potential for harm has gone.
Substitution	This involves substituting a dangerous process or substance with one that is not as dangerous.
Isolation	Separate or isolate the hazard from the people.
Engineering	Introduce or substitute an engineered device to eliminate or reduce the risk.
Administrative	Administrative solutions usually involve modification of the likelihood of an accident happening. This is done by reducing the number of people exposed to the hazard, and by ensuring that those who shall remain exposed know about the hazard and how best to manage it. Administrative solutions also include danger signs and written systems of work, such as those for working in confined spaces and lock-out procedures.
PPE	Provision of personal protective equipment shall only be considered when all other control methods are impractical. They provide a means to increase control and offer a last line of defence when used with another method higher up the hierarchy.

**Table D.2 — Classification of risk and rating**

Step 1. Assess the Likelihood			Step 2. Assess the consequences			
L1	happens every time we operate	Almost Certain	Common or repeating occurrence	C1	Fatality	Catastrophic
L2	happens regularly (often)	Likely	known to have occurred "has happened"	C2	Permanent disability	Major
L3	has happened (occasionally)	Possible	could occur or "heard of it happening"	C3	Medical/hospital or lost time	Moderate
L4	happens irregularly (almost never)	unlikely	not likely to occur	C4	First aid or no lost time	minor
L5	improbable (never)	Rare	practically impossible	C5	No injury	insignificant

Once the likelihood L1 to L5 and consequence numbers C1 to C5 are selected, a single Risk Rating can be selected from Table E.4.

**Table D.3 — Risk matrix**

Risk Rank Likelihood x Consequence	L1 Almost certain	L2 Likely	L3 Possible	L4 Unlikely	L5 Rare
------------------------------------	----------------------	--------------	----------------	----------------	------------

C1 Catastrophic	A	B	C	G	H
C2 Major	D	E	I	J	P
C3 Moderate	F	K	L	Q	R
C4 Minor	M	N	S	T	U
C5 Insignificant	O	V	W	X	Y

Risk Rank Likelihood x Consequence	L1 Almost certain	L2 Likely	L3 Possible	L4 Unlikely	L5 Rare
C1 Catastrophic	A	B	C	G	H
C2 Major	D	E	I	J	P
C3 Moderate	F	K	L	Q	R
C4 Minor	M	N	S	T	U
C5 Insignificant	O	V	W	X	Y

Table D.4 — Risk rating

Risk rating	
High risk	A-F
Medium Risk	G-M
Low Risk	P-Y

Table D.5 — Action plan

Date	Hazards obtained	Risk Rating	Actions for Eliminating or minimizing Risk	Action by Whom/position	Target date	Completion Date	Assessor & Signature


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**Annex E**  
(normative)

**Template for delegation of authority**

**General**

The template below shall be used to delegate authority

**Template E: Template for delegation of authority**

Company name:	District & Sector:	
Names of Staff and Position: Tel:	Date	signature
Reason for absence:		
From:	To:	
Names of appointed person: Tel:	Date	signature
Approved by the in-charge of human resources Names:	Date	signature

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## Bibliography

- [1] ISO 22932-2:2020, *Mining — Vocabulary — Part 2: Geology*
- [2] ISO 14159:2002, *Safety of machinery — Hygiene requirements for the design of machinery*
- [3] Law N° 66/2018 of 30/08/2018, *Law regulating labour in Rwanda*
- [4] Ministerial Order N° 013/MOJ/AG/19 of 16/07/2019 *determining requirements for granting authorisation to import, manufacture, transport, trade in and use dynamites in mining and quarry operations (Article 24)*
- [5] N° 02/MIFOTRA/22 of 30/08/2022, *Ministerial Order on occupational safety*

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