

# **CONSOLIDATION OF MINE HEALTH AND SAFETY REGULATIONS**

R-125-95

## **AS AMENDED BY**

This consolidation is not an official statement of the law. It is an office consolidation prepared by the Workers' Compensation Board of the Northwest Territories and Nunavut, for convenience of reference only. The authoritative text of regulations can be ascertained from the *Revised Regulations of the Northwest Territories, 1990* and the monthly publication of Part II of the *Northwest Territories Gazette*.

## **MINE HEALTH AND SAFETY REGULATIONS**

The Commissioner, on the recommendation of the Minister, under section 45 of the Mine Health and Safety Act and every enabling power, makes the Mine Health and Safety Regulations.

### INTERPRETATION

**1.01.** (1) In these regulations,

"Act" means the Mine Health and Safety Act;

"authorized person" means a qualified person appointed or designated, in writing, by the manager to perform specified duties;

"bail" means the supporting structure for a shaft conveyance whereby the conveyance is connected, through suspension gear, to the hoisting rope;

"conveyance" means any structure raised or lowered by a mine hoist in a shaft and includes a bucket, a counterweight, a piece of equipment, a single or multi-deck cage, a skip, a skip and cage combination and a single or multi-deck work platform;

"headframe" means a structure at the top of a mine shaft which carries the sheaves for the hoisting ropes;

"mine hoisting plant" means a mine hoist for an underground mine and includes the prime mover, transmission equipment, headframe, rock dump system, sheave wheel assembly, shaft ropes, shaft, conveyances, shaft sinking equipment, shaft furnishings, rock loading system, hoist controls, counterweight, signalling and communications equipment and any other equipment used in connection with a hoist;

"professional engineer" means a member or licensee qualified to practise professional engineering in accordance with the Engineering, Geological and Geophysical Professions Act

"qualified person" means a person who is

- (a) qualified because of his or her knowledge, training and experience to design, organize, supervise and perform the duties for which he or she is appointed,
- (b) familiar with the provisions of this Act, the regulations, and the code that apply to the duties for which he or she is appointed, and
- (c) capable of identifying any potential or actual danger to health or safety in the workplace.

"safety catch" means a safety appliance or fitting which transfers the weight of the cage onto the shaft guides if the hoisting rope breaks;

"send" includes deliver;

"shaft"

- (a) means an excavation of limited perimeter compared with its depth in which persons and material, or both, are transported by means of a mine hoisting plant, and
- (b) includes a winze;

"shaft furnishing" means any installation within the shaft, other than casing and lining, which is required to support the shaft or services within the shaft;

"shaft lining" means the continuous or non-continuous timber, concrete, brick or steel structure, or weld mesh, fixed around the shaft to support the walls;

"shaft obstruction" means any protrusion into a shaft compartment in which hoisting may be conducted;

"shaft rope" means any rope used with a shaft hoist installation including a hoisting rope, a balance rope, a guide rope and a rub rope;

"suitable" means suitable in the opinion of the chief inspector;

"suspension gear" means all components necessary to effect a secure attachment between the hoisting rope and the conveyance;

"work platform" means a platform attached through suspension gear to the hoisting rope and used by persons performing work in a mine shaft.

(2) Where these regulations impose a duty in respect of a mine and no person is specified as having the obligation to fulfil that duty, the manager shall fulfil the duty or shall ensure that it is fulfilled by another person.

(3) Where a code of rules or standards established by any association, person or body of persons is referred to in these regulations, that code is deemed to be adopted, as amended from time to time, for the purposes of these regulations.

## PART I

### GENERAL DESIGN AND OPERATING PROCEDURES

#### **1.02.** In this Part,

"rock mass characteristics" means a numerical index or rating that is derived from a semi-quantitative evaluation of rock discontinuities and other inherent qualities used to determine the ground stability in a specific area of an excavation and that classifies the ground based on this evaluation;

"rockburst" means a mining-induced seismic event that causes injury to persons or damage to underground workings or equipment;

"seismic event" means a transient earth motion that is caused by a sudden release of potential or stored strain energy in the rock;

"tendon support" means rockbolts, rebars, friction anchors, cable bolts or similar equipment used to support ground;

"tension crack" means a crack created by tension forces or the opening of joints by such forces;

"uncontrolled fall of ground"

(a) includes a fall of ground made up of rock, fill or other material, and

(b) does not include

(i) a fall occurring as a result of

(A) scaling operations, or

(B) blasting operations, where the fall occurred within the blasting heading, stope or at the face of a surface mine before re-entry after the blast, or

(ii) a predicted fall documented in writing to an inspector before the occurrence;

"working ground" is a condition where material such as rock, when under stress, may crack, creep or shift depending on the stiffness characteristics of the rock mass and the magnitude of the resulting strain, given by symptoms such as cracking, popping and grinding noises.

## GROUND STABILITY DESIGN

### Mine Design

**1.03.** (1) The owner of a surface mine or an underground mine shall maintain a mine design, acceptable to the chief inspector, assessing the ground stability of the active and proposed workings of the mine.

(2) The mine design that the owner is required to maintain shall be prepared by or under the direction of a professional engineer experienced in ground stability design and shall bear the engineer's seal and signature.

**1.04.** The mine design shall consist of drawings, plans, calculations, specifications and written descriptions and shall

- (a) describe the geology of the mine;
- (b) outline the geometry of existing excavations, if any, and proposed excavations;
- (c) provide the rock mass characteristics that are representative of the ore, footwall and hanging wall rock that will be encountered most frequently and identify the orientation of the most common joint sets;
- (d) describe the hydrological features that may affect the working of the mine;
- (e) describe previous occurrences of ground instability and include recommendations from reports of investigations;
- (f) describe, for surface mines, expected climate conditions, the presence of permafrost, if any, and average monthly precipitation;
- (g) describe the mining method including bench or stope sequencing and blasting methods;
- (h) specify ground support systems, including pillars, backfill, timber support, tendon support and any other type of support, the criteria used concerning their selection, dimension, spacing and extent;
- (i) describe measures used and planned to assess potential ground instability;
- (j) include specific precautions to be taken concerning parts of the mine where bodies of water, overburden, tailings, gas, low oxygen or water soaked material may intrude or flood the workings; and
- (k) include such other information as the chief inspector may require.

**1.05.** The mine design shall be assessed and updated by an authorized person annually and before any major change is made to the mining method or the equipment used.

**1.06.** The mine design shall be available at the mine for examination by an inspector and by the Committee for the mine.

### Removal of Fill

**1.07.** The manager shall, before the removal of fill material that is not in a stockpile, ensure that removal of the fill material will not affect the ground stability of adjacent openings so as to create a hazard.

### Boundary Pillars

**1.08.** A pillar of not less than 30 m shall be maintained on both sides of a party boundary between adjoining underground mining properties.

**1.09.** Before any work may take place in a boundary pillar, the owner of the mine shall submit a report prepared by a professional engineer to the chief inspector, with copies to the owner or owners of adjacent mining properties, and no work shall commence without the approval of the chief inspector.

**1.10.** The report referred to in section 1.09 shall contain

- (a) drawings, plans and specifications of the type of work to be performed and of the ground support;
- (b) an assessment of
  - (i) the stability of the remaining portion of the pillar and surrounding rock,
  - (ii) any hazard associated with water or material that, when wet, may flow across the party boundary; and
- (c) such other information as the chief inspector may require.

**1.11.** A copy of the report referred to in section 1.09 shall be sent to the Committee by the owner.

**1.12.** The owner or owners of the adjoining properties may, within 30 days of receiving a copy of a report referred to in section 1.09, submit written comments on the report to the chief inspector.

#### Ground Support Systems

**1.13.** The manager shall develop a quality control program for ground support systems in an underground mine to ensure that support systems specified in the mine design are correctly installed and effective.

**1.14.** A copy of the quality control program shall be sent to the Committee by the manager.

**1.15.** The manager of an underground mine shall prepare procedures to be used concerning

- (a) activities relating to the installation of ground support systems in a worksite; and
- (b) activities that may require a person to be exposed to unsupported ground before support is installed.

**1.16.** Methods for undertaking the ground support activities and for preventing exposure of persons to unsafe conditions shall be set out in the procedures.

**1.17.** The procedures shall be developed from a report of an investigation of ground conditions to identify ground fall hazards prepared by or under the direction of a professional engineer.

**1.18.** The procedures shall be amended when conditions provided for in the report referred to in section 1.17 change.

**1.19.** The manager shall consult with the Committee during the preparation of the procedures concerning the content of those procedures.

**1.20.** Employees engaged in ground support activities shall be trained in the procedures and the recognition of ground instability.

**1.21.** A copy of the procedures and the report referred to in section 1.17 shall be made available to an inspector by the manager when the inspector requests them.

#### Training

**1.22.** The training required in the procedures referred to in section 1.15 shall

- (a) explain the function of the support system;
- (b) describe the installation method and the equipment to be used;

- (c) detail the adverse effects of poor installation and the reasons for quality control standards;
- (d) provide an understanding of monitoring systems;
- (e) give instruction on methods to identify signs of deterioration of supported or unsupported ground and of support systems; and
- (f) give "hands-on" instruction respecting support installations.

**1.23.** The manager shall send a copy of the training program and copies of any changes to the training program to the Committee and the Committee may make recommendations to the manager before the program is introduced or any changes are made.

#### Ground Control LogBook

**1.24.** A ground control logbook shall be maintained for surface and underground mines showing

- (a) the time, date and location of all tests relating to the requirements of the quality control program for ground support systems specified in section 1.13;
- (b) details of rock mass characteristics that are less than those described in paragraph 1.04(c);
- (c) details of uncontrolled falls of ground;
- (d) details of working ground, tension cracks or other signs of instability;
- (e) details of rockburst and seismic events;
- (f) damaged supports; and
- (g) measurements taken from monitoring devices.

**1.25.** In addition to the information required in section 1.24, the following shall also be provided in the ground control logbook:

- (a) details of any injury to persons and damage to equipment or mine structure as a result of ground movement; and
- (b) details of the records of ground monitoring devices in the area affected before the ground movement.

**1.26.** The shift boss shall convey the information contained in the ground control logbook to the employees and workers under his or her supervision and to all other persons working in the area under his or her supervision.

**1.27.** The ground control logbook shall be read and signed each day by the senior mine supervisor and by the mine engineer designated by the manager.

#### Scaling

**1.28.** During scaling operations in an underground worksite, no other work activity shall be conducted in that worksite that may hinder or interfere with the scaling procedure.

**1.29.** The manager of an underground mine shall provide and maintain an adequate supply of properly dressed scaling bars, chute bars, gads, and other equipment necessary for scaling and barring.

#### Precautions

**1.30.** Where a worksite, travelway, manway or other area of an underground mine is under repair or where a blast has taken place and the area is not to be worked during the next three shifts, the area shall be closed by barricades, fencing or other suitable means and the manager shall post warning signs.

## Need for Remedial Action

**1.31.** Where in an underground mine a potential or actual danger to the health or safety of a person has not been remedied or removed at the end of a work shift, the supervisor of the work shift shall make a record in writing describing the dangerous condition and the state of corrective measures taken and the supervisor shall sign the record.

**1.32.** The shift boss responsible for the work shift referred to in section 1.31 shall read and sign the record referred to that section.

**1.33.** The record referred to in section 1.31 shall be read and countersigned by the shift boss of the next work shift before any person on that shift does any work in the area of the dangerous condition and the shift boss shall advise the employees on that shift who may be affected by the dangerous condition of the dangerous condition, the state of corrective measures undertaken, and the work required to be done to remove or remedy the dangerous condition

## Monitoring

**1.34.** Where required by the mine design or an inspector, the manager shall ensure that such instruments or devices as are necessary to assess the ground stability are installed, maintained and regularly monitored, and the results of the tests shall be recorded in the ground control log-book.

## MINE OPENINGS

### Means of Egress

**1.35.** The owner of an underground mine shall provide and maintain at all times two separate means of egress to the surface except that the chief inspector may give written approval to vary this requirement during the exploration and development of the mine.

**1.36.** (1) Where at an underground mine the egress to the surface is solely by means of shafts not equipped with ladders, the owner shall provide an alternate means, acceptable to the chief inspector, whereby persons can be hoisted to the surface in the event of any failure of the power supply to or the control system of the hoist.

(2) The manager shall ensure that the alternate means for hoisting persons to the surface are thoroughly tested every six months.

(3) The record of the tests required by subsection (2) shall be recorded in the Hoisting Machinery Record Book under the signature of the person making the test.

**1.37.** The manager at every mine where access is solely by means of shafts shall take effective precautions to ensure that there is no possibility of any fire occurring that involves any part of the electrical distribution systems to the hoisting system that could simultaneously disable every hoist suitable for hoisting persons from that mine.

**1.38.** The manager at a mine where persons are hoisted in a shaft shall prepare a procedure acceptable to the chief inspector to enable a person trapped in a conveyance in the shaft to escape or be rescued.

**1.39.** Every means of egress to the surface shall be

- (a) of sufficient size to afford easy passageway for all persons including persons on stretchers and persons wearing self-contained breathing apparatus;
- (b) where necessary, provided with ladders or a hoisting system or other means of transport from the deepest workings to the surface;
- (c) marked on all levels by legible signs and arrows pointing the way of exit in a manner to expedite escape in smoke;

- (d) made known to all underground workers;
- (e) shown to all new employees before they are allowed to commence any work underground; and
- (f) inspected at least once a month by a competent person who shall give a written report of such inspection to the manager.

**1.40.** A surface structure covering a means of egress shall be constructed so as to reduce the danger from fire to a minimum and any material used shall have a minimum of two hours' fire resistance rating.

#### Support of Openings to the Surface

**1.41.** Where an underground mine is being developed after these regulations come into force, every shaft and raise opening to the surface shall

- (a) be provided with a collar of concrete or other material approved by the chief inspector;
- (b) be designed and constructed in compliance with good engineering practice; and
- (c) be secured to the bedrock.

#### Fencing of Tailings Ponds or Other Parts

**1.42.** Where the chief inspector is of the opinion that a fence should be erected around all or part of a mine or around tailings or arsenic sludge, the chief inspector shall, whether the mine is in operation or not, order the owner to erect a suitable fence or other means of protection for the purpose within such time as the chief inspector fixes.

**1.43.** Where an owner or manager fails to erect suitable fencing or other protective means within the time ordered by the chief inspector, the chief inspector may cause suitable fences or other protective means to be erected and all costs arising therefrom constitute a debt due to the **Board** and are recoverable in any court of competent jurisdiction.

### VENTILATION

#### Surface Buildings

**1.44.** In surface buildings at a mine, the owner shall equip the buildings with a ventilation system that shall be maintained and used to

- (a) provide oxygen in the atmosphere of not less than 19% by volume at any place in the building; and
- (b) dilute or remove contaminants from all worksites therein to prevent exposure of a worker to contaminants in excess of the values specified in these regulations.

#### Plans of Layout of Ventilation System for Mining Plant

**1.45.** The manager shall keep and maintain accurate plans and records of a surface building ventilation system showing

- (a) the location of all ventilation openings;
- (b) the location of all ventilation fans;
- (c) the volumes of air handled by the fans and openings;
- (d) the volumes of air withdrawn by processing equipment; and
- (e) the location and functions of all ventilation regulating doors, louvres and other devices.

**1.46.** Where the atmosphere in a surface building may contain chemical or physical agents that are likely to endanger the health and safety of any person, equipment for the detection of such agents shall be provided and maintained by the owner and such equipment shall be readily accessible and **a record shall be kept of the maintenance.**



## Underground Mine

**1.47.** In an underground mine, a mechanical ventilation system shall be provided by the owner and the system shall be maintained and used to

- (a) provide oxygen in the general body of air of not less than 19% by volume; and
- (b) dilute or remove contaminants from all worksites therein to prevent exposure of any person to contaminants in excess of the values specified in these regulations.

**1.48.** The return air from all working places shall, where practicable, be routed directly to the return airway.

## Fans

**1.49.** Any structure housing ventilating fans shall be constructed of non-combustible material.

**1.50.** Primary fans supplying ventilating air to underground workings shall be installed on the surface by the owner unless otherwise approved by the chief inspector and shall be

- (a) provided with means for reversing the direction of airflow; and
- (b) fitted with suitable devices to give warning of any malfunction.

## Reversing of Mine Air

**1.51.** The direction of flow of the main ventilating air current shall not be reversed without the authorization of the manager of the mine.

**1.52.** The manager shall, without delay, give notice to the chief inspector of any reversal of the direction of flow of the main ventilating air current to deal with a hazardous condition underground.

## Authorization Required for Main Fan Underground

**1.53.** The chief inspector may authorize the installation of a main fan underground, subject to such tests and conditions as the chief inspector may require.

## Auxiliary Ventilation

**1.54.** To prevent exposure of persons in an underground mine to contaminants in excess of the values set out in these regulations

- (a) a development, exploration or production worksite shall be ventilated throughout by an auxiliary ventilation system for any advance in excess of 10 m from the main ventilation airflow; and
- (b) subject to section 1.59, a continuous supply of air shall be provided and used to dilute and remove contaminants in a raise and in a sub-drift for any advance in excess of 10 m from a main or auxiliary mine ventilation system airflow.

**1.55.** The manager of an underground mine shall prepare rules and procedures for the installation and use of auxiliary ventilation systems and employees involved with such installation and use shall be instructed in the content of those rules and procedures.

## Auxiliary Ventilation

**1.56** The Committee shall be given the opportunity to review the rules and procedures referred to in section 1.55 before they are put into effect and the management shall send a copy of the rules and procedures to the chief inspector.

**1.57.** An auxiliary fan shall not be installed or operated in an underground mine other than in accordance with good engineering practice and with the rules and procedures prepared under section 1.55 and the manager shall ensure

- (a) that sufficient fresh air reaches the fan at all times to prevent recirculation;
- (b) that air circulated by the fan is not contaminated with dust or noxious gases at any time in excess of the threshold limit value (TLV) set out in the handbook Threshold Limit Values for Chemical Substances and Physical Agents issued by the American Conference of Governmental Industrial Hygienists;
- (c) that no air containing more than 1.25% by volume of any flammable gas passes through or over the fan; and
- (d) that every auxiliary fan is electrically connected to ground to prevent the accumulation of an electrostatic charge.

#### Use of Compressed Air

**1.58.** Compressed air may be used for ventilation in a raise or sub-drift and shall be

- (a) independent of the air supplied to and exhausted from equipment or drills;
- (b) controlled only at the beginning of the raise or sub-drift;
- (c) noise attenuated at the point of discharge to decrease the noise level to comply with the standards set out in Part IX;
- (d) before discharging, filtered to remove scale, oil and other contaminants; and
- (e) operating when a blast is detonated unless procedures required under section 1.69 are in force.

**1.59.** The exhaust from any compressed air powered drill or machine shall not be used for ventilation purposes.

#### Appointment of a Qualified Person

**1.60.** At every underground mine employing 50 or more persons underground, the manager shall appoint a qualified person to be responsible for ventilation planning, measuring and sampling.

#### Measurements

**1.61.** The manager shall ensure that measurements are made of ventilation quantities at measuring stations established in main intakes, main returns, main fan drifts, main haulageways and major ventilation splits, at intervals not exceeding three months and when there is any major change to the ventilation layout.

**1.62.** Where diesel equipment is operated underground, measurements of ventilation air quantity shall be taken as required by paragraph 10.63(1)(a).

#### Records

**1.63.** The person who takes the measurements required by section 1.61 shall record them in a log-book kept for that purpose and the log-book shall be signed by the senior person responsible for safety of the mine.

#### Interruption to Main Ventilation

**1.64.** Where the main system of ventilation for an underground mine is stopped

- (a) all persons underground shall be informed in accordance with procedures established by the manager;
- (b) all diesel powered equipment shall be shut down; and
- (c) where a hazard to persons exists or the stoppage is longer than one hour, all persons shall be removed to the surface of the mine or to an approved refuge station in accordance with the manager's emergency procedures and there shall

be no entry of persons until the ventilation has been restored, a complete change of air has occurred throughout the mine and the active workings have been inspected and declared safe by an authorized person.

#### Unventilated Workings

- 1.65.** The manager shall ensure that any area of a mine that is not being ventilated is
- (a) effectively barricaded to prevent inadvertent entry;
  - (b) posted with signs to warn persons that entry is prohibited; and
  - (c) examined by an authorized person before any person is permitted to enter that part of the mine to determine
    - (i) oxygen content,
    - (ii) the presence of toxic or noxious gases, fumes, vapour, mist or dust, and
    - (iii) any other dangerous condition.

**1.66.** The manager shall ensure that the authorized person who is to carry out the examination referred to in paragraph 1.65(c) is provided with instructions in writing setting out

- (a) the hazard involved;
- (b) the use of testing equipment required;
- (c) the personal protective equipment he or she is required to use or wear; and
- (d) any other precautions and procedures to be taken for his or her protection.

#### Control of Airborne Dust

**1.67.** Where the mine workings are in a permanently frozen environment, or where other extenuating conditions exist, the chief inspector may vary the requirements set out in sections 1.68 and 1.69.

- 1.68.** (1) The manager shall
- (a) ensure that the concentration of dust in the air of the mine does not exceed the occupational exposure limits;
  - (b) ensure that all ore and waste passes are constructed and used so as to keep to a minimum the escape of dust into the air of the mine;
  - (c) provide every development heading, drift and raise with a water spray that must discharge within an effective distance of the face being advanced; and
  - (d) provide on every drill used underground, a water jet spray or other suitable equipment to prevent the escape of dust and shall require that the equipment be used at all times during any drilling operation.

(2) A water spray referred to in paragraph (1)(c) shall be applied so as to wet the face being advanced thoroughly after blasting and, if such area is not thoroughly wetted prior to the entry of any person, it shall be wetted down as soon as possible

#### Combustible Dust - Metal Mines

- 1.69.** In any metal mine where the sulphur content of the ore is high and a sulphide dust explosion may occur, the manager shall prepare and implement a procedure, acceptable to the chief inspector, for minimizing the danger from a sulphide dust explosion including
- (a) provision for ensuring that all persons are removed to a place of safety prior to blasting;
  - (b) provision for ensuring that all accessible headings, raises, bins, chutes and other workplaces within 30 m of a worksite are washed down to remove dust prior to blasting or hot work; and
  - (c) any other measures that could reduce the risk of a dust explosion or lessen the consequences, if one should occur.

## Precautions When Flammable Gas is Encountered in Mines

- 1.70.** (1) Where a flow of flammable, toxic or noxious gas is encountered in a drill hole in an underground mine or in an enclosed building housing a diamond drill on surface,
- (a) all equipment shall be shut down;
  - (b) the affected area shall be evacuated;
  - (c) precautions shall be taken to prevent inadvertent entry by a person into the area;
  - (d) the drill operator shall notify a supervisor;
  - (e) the area shall be tested by an authorized person; and
  - (f) the area shall be designated as a fire hazard area.
- (2) A record of the encounter shall be entered in the log-book and shall be countersigned by the next supervisor.

- 1.71.** In mines where flammable gas is known to occur, the manager shall ensure that
- (a) the persons working in an underground area where such gas is known to occur, or diamond drillers on the surface, are advised of
    - (i) the probability of encountering a flow of such gas, and
    - (ii) the measures set out in section 1.70;
  - (b) monitoring equipment is provided and maintained in accordance with the manufacturer's recommendations; and
  - (c) the persons to whom the monitoring equipment is issued are trained in its use.

## Battery Charging Stations

- 1.72.** (1) The manager shall ensure that storage batteries that discharge flammable gases are electrically charged in rooms or areas designed solely for that purpose.
- (2) The manager shall ensure that a room or area referred to in subsection (1)
- (a) is adequately ventilated to prevent the accumulation of flammable gases;
  - (b) is free from all sources of ignition;
  - (c) is marked at the entrance with a notice prohibiting smoking or open flames;
  - (d) has a floor of non-sparking material with adequate drainage;
  - (e) when storage batteries are mounted in trays or on racks, has level trays or racks constructed or covered with non-sparking material and of sufficient strength to carry the weight of the batteries;
  - (f) has a sufficient supply of fresh water for flushing and neutralizing spilled or splashed electrolyte;
  - (g) has wiring and equipment that comply with sections 26-540 to 26-554 of CSA Standard C22.1-94, Canadian Electrical Code, Part I;
  - (h) has equipment of adequate capacity if equipment is used for hoisting or handling batteries; and
  - (i) is not used for general storage.

**1.73.** The manager shall ensure that the floor in a storage battery room or area is washed promptly when electrolyte is spilled.

**1.74.** The manager shall appoint a qualified person to change or to charge a storage battery.

**1.75.** The manager shall supply acid resistive gloves, aprons, goggles or face shields and straps for carrying storage batteries to an employee handling storage batteries or electrolyte.

**1.76.** An employee shall use the protective equipment referred to in section 1.75 when handling storage batteries or electrolyte.

## Condition of Batteries

- 1.77.** The manager shall make arrangements to ensure that
- (a) every storage battery is kept free from dust;
  - (b) every storage battery in use is adequately secured;
  - (c) when a storage battery is of no further use, it is disposed of in a manner that prevents spillage of electrolyte; and
  - (d) ventilation openings in every storage battery are kept clear.
- 1.78.** An employee shall
- (a) when diluting concentrated sulphuric acid for a storage battery, add the acid to the distilled water; and
  - (b) keep the charging rate of storage batteries at a rate that will prevent the too rapid generation of hydrogen in the battery.

## WATER AND DRAINAGE

### General

- 1.79.** A workplace in an underground mine shall
- (a) be kept free from accumulation or flow of water which might endanger a person in the area; and
  - (b) have a drainage system to conduct excess water to a pumping system capable of pumping the water to surface for disposal.

### Bore Holes and Precautions

**1.80.** Where there is or may be an accumulation of water or any material that may flow when wet, any working approaching such an accumulation must have bore holes drilled in advance and such additional precautionary measures must be taken as will obviate the danger of a sudden breaking through of water or material that may flow when wet.

### Old or Abandoned Workings

**1.81.** No workings in a mine shall approach or be conducted within 100 m of old workings or abandoned workings until the manager has caused an examination of the old workings or abandoned workings to be made to determine their condition.

**1.82.** Where it is not possible to carry out the examination required under section 1.81, the manager shall prepare a procedure and submit it to the chief inspector for his or her approval and give a copy to the Committee.

**1.83.** No work shall be done within 100 m of the old or abandoned workings until the chief inspector has approved the procedure prepared under section 1.82.

### Drilling Under or Beside Water

**1.84.** No underground work shall be done within 100 m of the vertical plane expressing the margin of a body of water or water-saturated surface feature until plans and vertical mine sections as described in section 1.119, together with a proposed work procedure, have been approved by the chief inspector.

**1.85.** The plans and sections referred to in section 1.84 must detail the nature of the materials extending from the surface to the bedrock surface below it.

**1.86.** Section 1.84 does not apply to workings below those where crown pillars approved by the chief inspector are established or where the vertical distance from the bottom of a body of water or water-saturated surface feature to the workings exceeds 100 m.

## Dams

**1.87.** No dam higher than 600 mm or behind which more than 50 cubic metres of water may be impounded shall be constructed underground without the written approval of the chief inspector and then only when constructed in accordance with designs and specifications of a professional engineer.

## Bulkheads

**1.88.** No bulkhead that may retain water or unconsolidated materials shall be constructed underground without the written approval of the chief inspector and then only when constructed in accordance with designs and specifications of a professional engineer except for standard backfill bulkheads conforming to a design previously approved in writing by the chief inspector.

## Stairways and Walkways

**1.89.** The owner shall provide a safe means of access to a work site.

**1.90.** Where workers are required to work, operate, maintain or service equipment, a safe means of access shall be provided as required by section 1.89.

**1.91.** The owner shall provide every walkway and every working platform more than 1.5 m above the ground with

- (a) a handrail not less than 910 mm nor more than 1.07 m above the floor of the walkway or platform;
- (b) a second rail placed at mid-point between the top rail and the floor of the walkway or platform, unless the space between the top rail and the floor is closed by a screen; and
- (c) toeboards that extend from the floor to a height of not less than 100 mm.

**1.92.** The handrail required by paragraph 1.91(a) shall be capable of withstanding a load applied in any direction to the top rail of at least 0.9 kN.

**1.93** Notwithstanding paragraphs 1.91(b) and (c), toeboards and second rails are not required on a temporary walkway or working platform or on an underground drilling platform that is normally not more than 3 m above the ground.

**1.94.** When a platform consists of wooden planks, the planks shall

- (a) be sound, unpainted and free of large knots;
- (b) provide a minimum safety factor of three times the maximum load to which it is likely to be subjected; and
- (c) be nailed or otherwise secured against movement.

**1.95.** Where a means of access to a work place is inclined at more than 20° and less than 50° to the horizontal, the manager shall ensure that a stairway or ladderway is provided.

**1.96.** Where a means of access to a work place is inclined at 50° or more to the horizontal, the manager shall ensure that a ladder is provided.

**1.97.** A stairway shall

- (a) be at an angle not greater than 50° to the horizontal;
- (b) not have the rise or vertical distance between landings of a flight exceed 3.6 m;
- (c) have the treads and risers uniform in width and height respectively in any one flight; and
- (d) be provided with handrails of adequate strength not less than 910 mm and not more than 1.07 m in height above the treads of the stairs.

## Ladders

**1.98.** Except in an underground mine, a ladderway at an angle steeper than 70° to the horizontal shall be fixed in place and be provided with

- (a) platforms at intervals not greater than 7 m;
- (b) a safety cage; or
- (c) a protective device that, when used, will prevent a worker from falling.

**1.99.** Except in an underground mine, where platforms are used in conjunction with a ladderway

- (a) the ladders shall be offset;
- (b) a platform shall be provided at each place where ladders are offset; and
- (c) the platform shall be not less than 600 mm in width by 1.2 m in length.

**1.100.** A portable ladder shall

- (a) be equipped with non-slip feet or otherwise secured;
- (b) where any activity in the vicinity may create a hazard to a person on the ladder, be protected at its base; and
- (c) where the ladder has metal or metal-reinforced side rails, not be used near exposed and energized electrical circuits or equipment.

**1.101.** Where a ladderway is installed in an underground mine or in a headframe used in conjunction with a shaft and the ladderway is inclined at more than 70° from the horizontal,

- (a) the ladderway shall be provided with solid platforms at intervals not greater than 7 m;
- (b) the ladders shall be offset at the platform;
- (c) except for openings large enough to permit the passage of a person, a person on a stretcher or a person in breathing apparatus, the platforms shall be fully closed; and
- (d) if installed in a shaft manway, the ladders shall be placed over the openings of the platforms below.

**1.102.** Where the ladderway is inclined at less than 70° to the horizontal the ladders may be continuous and paragraphs 1.101(a) and (c) apply.

**1.103.** Where a ladderway is inclined at less than 50° to the horizontal, no platform is required except at points of offset.

**1.104.** Where a ladderway is the only means of access for mine rescue purposes, the opening shall be large enough for such purpose.

## Riding and Clearance in Travelways

**1.105.** The manager shall apply to the chief inspector for permission to transport persons on an incline or slope in a mine by means of track or other form of haulage.

**1.106.** No person, unless authorized by the manager, shall ride on or against a car, locomotive or train.

**1.107.** Section 1.106 does not apply where persons are being transported in personnel carriers where

- (a) there is a clearance of not less than 1.1 m above each seat, if the car does not have a roof;
- (b) there is a clearance of not less than 150 mm above the roof if the car does have a roof; and
- (c) safety chains are used between the cars and between the first car and the locomotive, in addition to the normal couplings.

**1.108.** Where the face of an inclined tunnel in a mine exceeds a vertical depth of 100 m without intermediate access to the tunnel from a shaft with man hoisting facilities, a vehicle shall be provided to transport persons down and up the tunnel.

#### Haulage Clearances

**1.109.** (1) Subject to subsections (2) and (3), a haulageway for vehicles running on rails in an underground mine shall have a clearance of 300 mm on one side of the train and no less than 600 mm on the other side of the train, the clearances to be measured over the maximum width of the widest vehicle.

(2) A haulageway that is used for vehicles that run on rails and travel more than 12 km/h shall have an unobstructed walkway on one side of at least 1.5 m between the side of the haulageway and the vehicle and pedestrian traffic shall be restricted to designated periods during which no vehicle running on rails shall be used in the haulageway.

(3) Where pedestrian traffic is permitted in a haulageway to which subsection (2) applies and the walkway is less than 2 m in width, safety stations shall be provided at intervals not exceeding 30 m.

**1.110.** A haulageway used by mobile equipment other than a haulageway referred to in section 1.109 shall,

- (a) except where pedestrian traffic is effectively prevented, be not less than 1.5 m wider than the maximum width of the mobile equipment using the haulageway;
- (b) where it is regularly used by pedestrians and it is less than 2 m wider than the maximum width of mobile equipment using the haulageway, have safety stations at prescribed intervals not exceeding 30 m; and
- (c) except in an underground mine with a low clearance roof in which equipment designed to be operated therein is used, have a minimum of 300 mm clearance above the head of a person travelling on the mobile equipment or above a canopy where fitted.

#### Haulageway Safety Stations

**1.111.** The safety stations required by subsection 1.109(3) and paragraph 1.110(b) shall

- (a) be plainly marked;
- (b) be clean and free of obstructions, including drainage ditches; and
- (c) if made after the coming into force of these regulations,
  - (i) be cut as close to perpendicular to the haulageway as is practical,
  - (ii) be no less than 1 m in depth, in addition to the clearance between the vehicle and the wall,
  - (iii) be no more than the height of the roadway or 2 m whichever is less, and
  - (iv) be no more than 1.2 m in width.

#### Haulage Warning Devices

**1.112.** The manager shall provide suitable means to ensure that, where a person or persons are working in a location where tracked or trackless mobile equipment may be operating, the operators of the mobile equipment are fully aware of their presence.

## PLANS

### General

**1.113.** The manager shall ensure that the surveying of a mine and the preparation of mine plans required by these regulations is conducted by a qualified person who holds a land surveyor's certificate or a mine surveyor's certificate issued under section 7.08.



**1.114.** All active workings in an underground mine shall be surveyed and the plans updated as frequently as necessary to protect the health and safety of employees when mining close to other workings, diamond drill holes and dominant geological features and these workings, holes and features shall be identified on the plans.

**1.115.** The manager shall ensure that each shift boss is provided with current plans for his or her assigned area of responsibility indicating the size, dip and length of all workings, diamond drill holes and dominant geological features and

- (a) the plans shall clearly indicate places where openings are or will be within 8 m of a breakthrough and the presence of holes likely to contain explosives; and
- (b) the shift boss shall ensure that the mining crews are informed of those possible breakthrough places.

**1.116.** The manager shall make and keep complete and accurate plans acceptable to the chief inspector of

- (a) the boundaries and workings of the mine, and of any other workings, whether or not the workings have been discontinued or abandoned; and
- (b) geological features that may affect the safety of the mine.

**1.117.** (1) The plans referred to in section 1.116 shall be

- (a) kept at the mine by the manager with copies kept off the site by the owner;
- (b) prepared and revised at suitable intervals not exceeding three months;
- (c) marked with the date on which the plan or section was first prepared and with the date of each subsequent revision;
- (d) marked with a suitable indication of scale;
- (e) permanently and clearly drawn or printed on suitable and durable material; and
- (f) maintained in good condition.

(2) Where the plans and sections required by section 1.116 are stored electronically, one complete hard copy shall be kept at the mine in accordance with subsection (1) and two back-up copies shall be kept of which one shall be kept off site.

**1.118.** The owner of a mine shall make parts of the plans required to be kept by section 1.116 available to the owner of an adjoining mine if those parts are needed to assist in the preparation of the plans for that adjoining mine.

#### Description of Plans

**1.119.** The plans required to be kept by section 1.116 shall include

- (a) a surface plan showing the claims, licences or leases on which mining is being conducted, and lakes, watercourses, naturally unstable ground such as peat bogs or sloughs, main roads, railways, power transmission lines, buildings, shaft openings, adits, surface workings, diamond drill holes collared on the surface, dumps, dams, tailings ponds and their overflow channels and topographic contours;
- (b) a separate underground plan of every level showing all workings including shafts, tunnels, pillars, diamond drill holes, dams, bulkheads, electrical substations, explosive storage areas, shop areas, permanent seals and stoppings and geological features;
- (c) vertical mine sections at suitable intervals and azimuths showing all shafts, tunnels, drifts, ramps, rooms, stopes, diamond drill holes and the location of the top of the bedrock, surface and type of the overburden and the bottom and surface of any known body of water or watercourse;
- (d) a ventilation plan showing the normal direction and volume of the main air currents and the location of permanent fans, ventilation doors, stoppings and connections with adjacent mines, if any;
- (e) a plan indicating the position of all fixed electrical apparatus in the mine and the routes of all fixed power feeders and fixed branch feeders, properly rated and

referenced and the rating of electrical feeder control apparatus and equipment;  
and

- (f) plans of the workings for emergency egress and mine rescue which shall show
  - (i) the normal routes of egress,
  - (ii) the emergency route of egress,
  - (iii) refuge stations,
  - (iv) normal ventilation flows, control doors, fire doors and fans,
  - (v) power distribution and compressed airlines, and
  - (vi) any hazardous areas such as fuel storage areas.

#### Posting of Mine Rescue Plan

**1.120.** The manager of every underground mine shall post, or have posted, in conspicuous places accessible to all persons working underground, a copy of the plan required by paragraph 1.119(f) and the manager shall send a copy to the chief inspector and the Committee.

#### Inspector to Examine

**1.121.** The manager of an operating mine shall produce all plans and vertical mine sections to an inspector for examination and shall supply the inspector with copies upon request.

#### Annual Submission of Plans

**1.122.** The owner or manager of a mine shall submit to the chief inspector, on or before March 31 in each year,

- (a) up to date copies of all plans required to be kept by section 1.116; and
- (b) a statement signed by the owner or manager of the mine, stating that the plans are accurate.

#### Discontinued Work at Mine

**1.123.** (1) When work at a mine is to be discontinued for more than 12 months, the owner or his or her agent shall, within 90 days of discontinuing work, send to the chief inspector copies of the up-to-date plans accurate to the time the work was discontinued.

(2) Plans sent to the chief inspector pursuant to subsection (1) shall be retained until six months after work at the mine recommences.

#### Confidentiality of Plans

**1.124.** No person, other than the owner of a mine, shall publish any plans kept pursuant to section 1.123 or disclose any information with respect to those plans without the consent in writing of the owner of the mine or an order of the Supreme Court.

#### Failure to Provide Plans

**1.125.** (1) Where the manager fails to provide the plans required by section 1.123 or the plans are inadequate, the chief inspector may have the mine surveyed and the plans prepared, and the costs of the survey and the preparation of the plans may be recovered from the owner.

(2) The owner and the manager of the mine shall provide to the surveyor all necessary facilities and information for purposes of making the new plans or sections required by subsection (1).

## SECURITY

### Fencing and Securing Openings

**1.126.** The top of every mill hole, manway or other opening must be kept covered or otherwise protected from inadvertent entry.

**1.127.** Where repair work is in progress in any manway or where conditions arise that may endanger travel through any manway, the manway shall be closed off.

### Surface Openings

**1.128.** The manager shall ensure that surface excavations or openings are securely fenced or otherwise protected against inadvertent access.

### Protection of Uneven Surface

**1.129.** Any opening in a floor or other surface that may be a hazard to a worker shall be protected by a guardrail or covered with securely fastened planks or other material capable of supporting any load to which it is likely to be subjected.

### Securing Shafts

**1.130.** A shaft, raise or other opening in an underground mine shall be securely fenced, covered or otherwise guarded.

**1.131.** All openings, sumps, vessels, bins, hoppers, elevated platforms or pits, other than grease pits or open pit mines, which constitute a hazard, shall be fenced or otherwise guarded.

## SURFACE MINES

### Prohibitions

**1.132.** No person shall carry out the excavation of clay, earth, sand, gravel or other unconsolidated material in a surface mine within a distance from the property boundary that is determined by multiplying the ultimate depth of excavation in the unconsolidated material by 1.5, and material that sloughs from within this distance shall not be removed.

**1.133.** No person shall excavate rock within a distance of 5 m from the property boundary.

**1.134.** The owners of adjoining properties may, by agreement, apply to the chief inspector in writing, to issue a variance to the provisions of sections 1.132 and 1.133.

### Security of Surface Mine Workings

**1.135.** All trees and other vegetation, clay, earth, sand, gravel, loose rock or other unconsolidated material lying within 2 m of the rim of a working face or wall in a surface mine shall be removed and beyond this distance all unconsolidated material shall be sloped to an angle less than the natural angle of repose.

### Examination of Surface Working Face

**1.136.** (1) No work shall be conducted at or below a face or wall of a surface mine until that face or wall has been examined and declared safe by the shift boss.

(2) Nothing in subsection (1) shall prevent the shift boss from being accompanied by other persons who may be required to make the face or wall safe.

## Benches

- 1.137.** (1) Where a surface mine is worked in benches,
- (a) each catchment berm shall be designed so that its final width will not be less than 8 m; and
  - (b) loose rock shall not be allowed to accumulate on a bench or catchment berm in a manner that endangers any person working on a lower bench.

(2) The manager shall, in consultation with the Committee, develop a procedure acceptable to the chief inspector, that provides for the safety of workers should loose rock accumulate on a catchment berm and access to clean it not be possible.

## No Overhangs

- 1.138.** No person shall allow any part of a face or wall of a surface mine to overhang.

## Height of Vertical Face

**1.139.** At a surface mine where unconsolidated material is being worked or removed and could collapse onto the loading equipment, the vertical face shall not be higher than the reach of the loading equipment.

## Height of Working Face

**1.140.** Except where the working face is sloped at an angle acceptable to the chief inspector, the height of the working face shall not be more than 2 m higher than the reach of the loading equipment.

## Exception

- 1.141.** Sections 1.139 and 1.140 do not apply
- (a) where material is removed by backhoe, excavator, dragline or similar equipment operating from above the face that it is excavating; or
  - (b) where a multiple bench system of mining is being carried on in accordance with conditions approved by the chief inspector.

## Surface Haulage Roads

**1.142.** The manager shall prepare a plan which shows the type and method of construction for surface haulage roads that are to be constructed at the mine site.

- 1.143.** (1) The manager shall ensure that surface haulage roads are designed, constructed and maintained to provide
- (a) a travel width where dual lane traffic exists, of not less than three times, or where single lane traffic exists, of not less than two times the width of the widest haulage vehicle used on the road; and
  - (b) a shoulder barrier
    - (i) at least 3/4 the height of the largest tire on any vehicle using the road,
    - (ii) of a construction or a specification that is acceptable to the chief inspector,
    - (iii) located and maintained along the edge of the haulage road wherever a drop-off greater than 3 m exists, and
    - (iv) incorporating breaks that do not exceed the width of the blade of the equipment constructing and maintaining the breaks, to allow for drainage and snow clearance.

(2) For the purpose of paragraph (1)(a), the width of the barrier referred to in paragraph (1)(b) shall be in addition to the travel width.

(3) On open pit and surface roadways where the grade exceeds 5%, the chief inspector may require the manager to provide clearly identified emergency runaway lanes or retardation barriers placed at suitable locations and capable of bringing runaway vehicles to a controlled stop to be provided and maintained.

#### Waste Dumps, Dams and Impoundments

**1.144.** The manager shall make an application to the chief inspector, complete with the supporting documents required by the chief inspector, for the written approval of the design of a proposed waste dump, dam or impoundment, and copies of the complete application shall be sent to regulatory agencies specified by the chief inspector.

**1.145.** Any work required to collect information for the preparation of an application under section 1.144 is subject to the requirements of section 17.01.

**1.146.** The manager shall ensure that no work is commenced on a waste dump, dam or impoundment until the manager has received the written approval of the design by the chief inspector and possesses the applicable permits and licences.

**1.147.** The manager shall implement and maintain a surveillance and instrumentation program recommended in a waste dump design approved by the chief inspector.

#### Mine Dumps

**1.148.** The manager shall ensure, in respect of mine dumps, that

- (a) a generic plan for dumps, roads or ramps that are to be constructed as part of a dumping operation is prepared and
  - (i) given to the Committee, and to
  - (ii) submitted the chief inspector for his or her approval;
- (b) the construction is in accordance with the approved plan;
- (c) the approved plan and any modifications are communicated to those persons responsible for and employed in the construction;
- (d) where material is to be dumped from a vehicle into a bin, raise or other opening, a barrier of sufficient size and strength and anchored sufficiently to prevent the vehicle from inadvertently entering the bin, raise or opening, is provided and maintained; and
- (e) where dumping is prohibited or hazardous, dumping is prevented by erecting a barrier across the entrance that is sufficient to prevent access and by posting a sign that reads, "NO ENTRY FOR DUMPING PURPOSES".

**1.149.** The manager shall appoint qualified persons to act as dump persons.

**1.150.** A dump shall be designed by a professional engineer where required by the chief inspector or where it has one or more of the following characteristics:

- (a) a planned volume that exceeds one million cubic m;
- (b) a height of dump in excess of 50 m;
- (c) an area to be covered by the dump exceeding 5 ha;
- (d) it is founded upon natural or trimmed slopes which are sometimes steeper than 20° from a horizontal plane;
- (e) where waste material is dumped or placed in a water course having a potential peak flow greater than 1 cubic m per second, once in every 200 years,
- (f) it is situated in such a way that it may be a potential menace to a building, a road, a domicile, a prominent power transmission line, a pipeline or a major water course.

#### Stabilizing Exposed Slopes

**1.151.** Prior to the abandonment of any waste dump or impoundment, the owner shall assure the stability of the exposed slopes to the satisfaction of the chief inspector.

## Dump Stability

- 1.152.** No person shall drive or operate a haulage vehicle in such a manner as to
- (a) dump from the vehicle at a location where he or she has reasonable cause to believe that the ground is not capable of supporting the loaded vehicle; or
  - (b) remove material from the bottom of a dump or stockpile if he or she has reasonable cause to believe that a person may be injured as a result of the removal.

## Safety When Dumping

- 1.153.** No person shall drive or operate a haulage vehicle in such a manner as to dump material from the vehicle, except as described in paragraph 1.148(d),
- (a) over a bank that is 3 m high or higher, or
  - (b) within 3 m of the crest of the dump berm when the bank is 3 m high or higher;
- unless a dump person is directing vehicles to the dumping position and a dump berm is in place.

- 1.154.** No person shall drive or operate a haulage vehicle in such a manner as to dump material from the vehicle on the surface of a mine, except as described in paragraph 1.148(d),
- (a) over a bank that is less than 3 m high, or
  - (b) within 3 m of the dump crest,
- unless a dump berm is in place.

- 1.155.** (1) The driver of a haulage truck shall not
- (a) where the bank is more than 3 m high and the dumping position is within 3 m of the dump berm crest, move the vehicle backward to the dumping position or begin dumping until he or she has received from the dump person
    - (i) verbal directions,
    - (ii) standard visual signals shown in the document "Standard Hand Signals for Controlling Mobile Equipment Movement" issued by the chief inspector, or
    - (iii) audible signals acceptable to the chief inspector;
  - (b) operate the vehicle in reverse for a distance greater than four truck lengths on a dump other than a bin, raise or other opening referred to in paragraph 1.148(d);
  - (c) operate the vehicle in reverse for a distance greater than four truck lengths on a stockpile, ramp, road or a ramp or road that is under construction unless the ramp or road has a positive gradient of more than 5%; and
  - (d) operate the truck for a distance greater than one truck length with the box in the raised position.

(2) The driver of a haulage truck shall not dump while the truck is in motion.

- 1.156.** A dump person who is responsible for directing vehicles at a dump site shall
- (a) continually inspect the condition of the dump site and, if abnormal or hazardous conditions are observed, take corrective action to alleviate any danger to workers assigned to the dump;
  - (b) communicate immediately any abnormal or hazardous conditions found in the dump site to the supervisor; and
  - (c) when directing a vehicle to the dumping position, exert due vigilance to ensure the safety of all persons engaged in the dumping operations.

## EXAMINATION OF WORKINGS

### Duties of Shift Boss and Supervisor

**1.157.** Every worksite where persons work shall be examined in a diligent manner by a shift boss for underground areas and a supervisor for surface areas of an underground mine to ascertain that the worksite is in a safe condition, as often as the nature of work necessitates, but at least once during each shift.

**1.158.** (1) A shift boss shall examine all active parts of an underground mine including shafts, winzes, drifts, levels, crosscuts and other areas to determine that they are in a healthy and safe working condition, and such examinations shall be conducted at least once a week or more often as the nature of the work or operations require.

(2) Shafts and winzes described in subsection (1) may be examined by the shaft supervisor.

#### Inspections

**1.159.** (1) The manager shall prepare a procedure for the examination of worksites that provides for examination

- (a) of the condition of access routes, haulage roads and travelways;
- (b) of the suitability and safety of work practices;
- (c) of the general condition of equipment, tools and protective equipment and devices;
- (d) of the use of protective equipment and devices;
- (e) of the condition of refuge stations;
- (f) of the adequacy of ventilation;
- (g) for the presence of hazardous gases and toxic fumes;
- (h) of the security of ground conditions and effectiveness of the support;
- (i) of the emergency arrangements including safe means of egress;
- (j) of the provisions to ensure that work procedures are being properly followed; and
- (k) of any other matter that affects health and safety.

(2) The procedure referred to in subsection (1) shall also deal with safe handling of explosives and the nature and quantity of materials needed.

(3) The manager shall make suitable arrangements to ensure that examinations of worksites are conducted in accordance with the procedure referred to in subsection (1).

(4) The manager shall consult with the Committee during the preparation of the procedure referred to in subsection (1) concerning the content of the procedure.

(5) The manager shall send a copy of the procedure referred to in subsection (1) to the chief inspector and to the Committee.

**1.160.** (1) A dump or stockpile area on the surface of a mine shall be examined by the open pit shift boss or an authorized person

- (a) before material is permitted to be dumped, where dumping has not been carried on for a period of four hours or more; and
- (b) at least once and at intervals of not more than four hours during each shift when material is being dumped.

(2) The person who conducts the examination required by subsection (1) shall

- (a) record the details of the examination and any reports from a dump person in the log-book referred to in paragraph 5.07(j); and
- (b) communicate verbally any abnormal or hazardous conditions to the dump person.

**1.161.** (1) The manager shall prepare procedures for the examination of open pit workings including

- (a) accumulations of loose rock on catchment berms which may endanger persons working below;

- (b) the height of working face in relation to reach of machine digging it;
- (c) the presence of misfired holes;
- (d) the condition of roads to working area;
- (e) the traffic control procedures;
- (f) the visual condition of plant;
- (g) engineering controls for dust suppression; and
- (h) the presence of overhangs, face slips and faults in the face.

(2) The manager shall prepare procedures for the examination of waste rock dumps including

- (a) irregularities noted in the dump platform;
- (b) the adequacy of mixing of rock being dumped;
- (c) the drainage and water problems;
- (d) any over-steepening in dump face;
- (e) the adequacy of berms;
- (f) the adequacy of lighting;
- (g) the gradient of dump platform; and
- (h) any safety concerns beyond the toe of the dump.

(3) The manager shall prepare procedures for the examination of tailings ponds including

- (a) the condition of the face of the embankment;
- (b) signs of seepage;
- (c) sloughing;
- (d) the condition of beach;
- (e) the width of top of embankment; and
- (f) the depth of water.

## PART II

### HOURS OF WORK

**2.01.(1)** The manager shall not permit the employment of a person on surface of a mine for a period longer than 12 hours in a day and there shall be a minimum of 12 hours of rest between shifts.

**(2) The manager shall not permit the employment of a person underground at a mine for a period longer than eight hours in a day and there shall be a minimum of 12 hours rest between shifts.**

**(3) Notwithstanding subsection (2), the manager may permit the employment of a person underground at a mine for a period of longer than eight hours in a day but not longer than 12 hours in a day where**

**(a) the person is conducting underground exploration work at a mine from which the person cannot practically return to his or her home at the end of a day; and**

**(b) the manager has obtained the appropriate permit, if necessary, under subsection 6(1), 7(1), or 7(2) of the *Labour Standards Act***

**(4) repealed**

**(5) a person who works for a period longer than eight hours in a day is entitled to take a day of rest after 14 consecutive days of work.**

**(6) A person who works for a period longer than eight hours a day shall take 14 days of rest after 42 days of work.**

**(7) for the purpose of subsection (6), a day of rest taken under subsection(5) shall be counted as a day of work.**

**2.02. (1) Subject to subsection (2), on application by the manager, the chief inspector may vary the hours of work set out in subsection 2.01(1) or (2) by establishing hours of work with conditions for designated areas of a mine of for designated job classifications.**



**(2) The chief inspector may only vary the hours of work set out in subsection 2.01 (1) or (2) where the manager has obtained the appropriate permit, is necessary, under subsection 6(1), 7(1), or 7(2) of the *Labour Standards Act*.**

**2.03.** Before granting a variance under section 2.02, the chief inspector shall take into consideration the type of work being performed, the working environment and the location where the work is being performed.

**2.04.** Where the manager applies for a variance under section 2.02, the manager shall inform every employee who may be affected by the grant of a variance of the application.

**2.05.** When the chief inspector grants a variance under section 2.02, the manager who applied for the variance shall inform every employee affected by the variance and the Committee.

**2.06.** Sections 2.01 to 2.05 do not apply

(a) subject to section 2.07, in respect of an emergency that endangers life or property;

(b) in respect of work that is urgently needed, is essential to the continuation of the ordinary working of a mine and is of such a nature that the need for the work could not reasonably have been predicted; or

(c) where work schedules incorporate periodic shift changes within a 24 hour period.

**2.07.** Except where life is in danger, the manager shall not permit the employment of any person during an emergency referred to in section 2.06 to exceed 16 hours a day.

### PART III

#### Interpretation

**3.01.** In this Part,

"management co-chairperson" means the co-chairperson chosen for the Committee by the manager;

"worker co-chairperson" means the co-chairperson chosen by the worker members of the Committee from among the worker members elected to the Committee.

#### OCCUPATIONAL HEALTH AND SAFETY COMMITTEE

##### Composition of the Committee

**3.02. (1) The Occupational Health and Safety Committee established pursuant to section 11 of the Act shall consist of at least**

**(a) four members, where the number of employees at the mine is 15 or greater but less than 100;**

**(b) eight members, where the number of employees at the mine is 100 or greater but less than 250; and**

**(c) 12 members, where the number of employees at the mine is 250 or more.**

**(2) Where the number of employees at a mine is less than 15, the Manager shall establish an occupational health and safety program to ensure that occupational health and safety standards are observed.**

**(3) An occupational health and safety program established pursuant to subsection (2) shall consist of**

**(a) two occupational health and safety representatives;**

**(b) one management representative; and**

**(c) one worker representative chosen from the employees at the mine.**

**(4) The representative referred to in subsection (3) shall have the powers and responsibilities of a Committee with such modifications as the circumstances require.**

**3.03.** (1) The manager, or where there is a union local at a mine, the president of the union local, shall ensure that the workers are divided into groups that fairly represent the types of work being done at the mine.

(2) Each group of workers shall elect a worker from that group as a member of the Committee.

**3.04.** The worker members of a Committee shall be elected every two years by the workers at the mine to hold office for a term of two years.

**3.05.** The first election of worker members of a Committee shall take place within 60 days after the coming into force of these regulations.

**3.06.** A worker who is a member of a Committee may be re-elected by the workers for a second and subsequent terms.

**3.07.** The manager shall appoint the management members of a Committee to hold office for a term of two years.

**3.08.** The first appointment of management members of a Committee shall be made within 60 days after the coming into force of these regulations.

**3.09.** A management member of a Committee may be reappointed by the manager for a second and subsequent terms.

Vacancies

**3.10. Where a vacancy on a Committee occurs, the management co-chairperson and the worker co-chairperson, or their respective designate, shall ensure that an election is held or that an appointment is made, as the case may be, to fill the vacancy within 45 days from the day on which the vacancy occurred.**

**3.11 repealed**

**3.12 repealed**

**3.13 repealed**

Meetings

**3.14.** (1) Each meeting of a Committee shall be chaired by one of the co-chairpersons but the same co-chairperson may not preside over two consecutive meetings.

(2) For the purposes of subsection (1), an alternate of a co-chairperson is considered to be the co-chairperson for whom he or she is the alternate.

**3.15.** Every member of a Committee is entitled to a minimum of one hour for preparation for meetings of the Committee.

**3.16.** (1) The members of a Committee may, at any meeting of the Committee, raise any matter concerning health and safety at the mine.

(2) The Committee shall review and comment upon every procedure submitted to it pursuant to these regulations.

## Names

**3.17.** The co-chairpersons shall send the names of Committee members to  
(a) the mine manager;  
(b) the union local, if any; and  
(c) the chief inspector.

**3.18.** On receipt of the names of the Committee members from the co-chairpersons, the manager shall post the names in conspicuous locations at the mine.

## Inspections

**3.19.** Every month the Committee shall inspect as many of the worksites as it considers appropriate.

**3.20.** As soon as possible after an inspection referred to in section 3.19 but not later than seven days after the inspection, the Committee shall meet to discuss its findings and the findings of any team established under section 3.22.

**3.21.** (1) The co-chairpersons shall cause minutes of a meeting referred to in section 3.20 to be kept.

(2) The minutes of a meeting shall include a description of the conditions found at each worksite inspected during an inspection.

**3.22.** For the purposes of carrying out an inspection under section 3.19, the Committee may establish teams consisting of one worker member and one management member.

**3.23.** The co-chairpersons of a Committee shall send a copy of the minutes of each meeting of the Committee to  
(a) the manager;  
(b) the union local, if any; and  
(c) the chief inspector.

**3.24.** The manager shall post the minutes received pursuant to section 3.23 in conspicuous locations at the mine.

## Conspicuous Locations

**3.25.** The Committee shall determine the conspicuous locations at which the names of the Committee members and the minutes shall be posted.

## Investigations

**3.26.** The co-chairpersons of the Committee or a worker member and a management member of the Committee shall participate in the investigation of each reportable incident as defined in section 16.01 and each dangerous occurrence.

## Co-operation with the Committee

**3.27.** (1) The manager and all persons working at the mine shall co-operate fully with the Committee by  
(a) providing the Committee with every reasonable facility for carrying out **its functions**;  
(b) allowing the Committee access to all reports, plans, and records pertinent to the work of the Committee **including procedures, maintenance records and log books; and**

(c) **correcting the health and safety hazards noted in the inspection report, within 30 days after the day on which the inspection was carried out or by such later date as may be agreed to by the Committee.**

(2) **Where the Committee cannot reach an agreement on a health and safety issue, the Committee shall submit a written report to the manager.**

(3) **Within 15 days of receiving the report referred to in subsection (2), the manager shall reply, in writing, to the Committee.**

(4) **Where any member of the Committee considers the manager's reply under subsection (3) to be unacceptable, the Committee shall request the chief inspector to investigate the matter and to reply to the manager within 15 days of receiving the request.**

#### Training

**3.28.** (1) The manager shall, at least **three times in a** year, provide training that is relevant to the work of the Committee to its members.

(2) **The manager shall submit to the chief inspector an annual record of the training provided to the members of the Committee.**

#### Posting and Distribution of the Act and Regulations

**3.29.** (1) The manager shall ensure that

- (a) posters provided by the chief inspector containing selected sections of the Mine Health and Safety Act and these regulations are displayed at conspicuous locations;
- (b) every employee is given a copy of the Mine Health and Safety Act and these regulations at no cost to the employee; and
- (c) a copy of the Mine Health and Safety Act and these regulations is maintained in every safety office and at other suitable locations where they are available to employees.

(2) The manager shall keep copies of the Mine Health and Safety Act and these regulations available for sale to employees at cost, if an employee who has received a copy free of charge pursuant to subsection (1), asks for another copy.

### PART IV

#### RIGHT TO REFUSE WORK

##### Unsafe Work

**4.01.** An employee may refuse to carry out any work or operate any equipment, tool or appliance if he or she has reasonable cause to believe that to do so would endanger the health or safety of any person.

**4.02.** A supervisor shall not knowingly perform or permit a worker to perform work which could endanger the health or safety of any employee.

**4.03.** An employee who refuses to carry out work or to operate any equipment, tool, or appliance in compliance with these provisions shall immediately report the circumstances to his or her supervisor.

##### Investigations

**4.04.** The supervisor receiving a report under section 4.03 shall immediately investigate the matter and ensure that any dangerous condition is remedied without delay, or if, in his or

her opinion, the work refusal is not valid, the supervisor shall so inform the employee who made the report.

**4.05.** If the investigation required by section 4.04 does not resolve the matter to the satisfaction of the employee who made the report under section 4.03, a further investigation shall be made by the supervisor or other management representative in the presence of the employee who made the report, together with an employee having knowledge of the work in question and who is

- (a) a worker member of the Committee; or
- (b) if a worker member of the Committee is not available, another worker selected by the worker refusing to carry out the work.

**4.06.** Where a worker member of the Committee or the other worker referred to in paragraph 4.05(b) is not available to carry out the investigation referred to in section 4.05, the employee who made the report under section 4.03 may request the union local, if any, to designate a worker to make the investigation with the supervisor.

#### Use of Alternate Worker

**4.07.** Where an employee refuses to carry out the work after the supervisor and a person referred to in section 4.05 or 4.06 have investigated the work refusal and are both of the opinion that no employee is endangered,

- (a) if the refusal is considered peculiar to that particular employee, and
- (b) if there is no justification for an alternate employee to refuse to carry out the work in question,

then the supervisor, after informing the alternate employee of the reason for the refusal, may require him or her to perform the work.

**4.08.** Where it is determined by an investigation that an employee may be endangered, no employee shall perform the work until the situation has been remedied to the satisfaction of the employee doing the work.

#### Committee Investigates

**4.09.** Where the procedures set out in sections 4.03 to 4.07 fail to resolve the work refusal, the Committee shall conduct an investigation and either

- (a) develop a plan that is acceptable to an employee who will do the work and that will allow the work to proceed safely; or
- (b) permit the employee to continue to refuse to work.

**4.10.** The Committee shall submit to the manager a report on the investigation under section 4.09 that describes the situation and the remedial action required.

**4.11.** Where the procedures set out in sections 4.09 and 4.10 fail to resolve the work refusal, the employee who made the report or the manager may appeal to the chief inspector for the designation of an inspector to resolve the refusal.

#### Inspector to Investigate

**4.12.** The chief inspector shall designate an inspector who shall investigate the work refusal in the presence of the employee who so refused or the employee's designate and the manager or the manager's designate.

**4.13.** The inspector shall give his or her decision without delay upon concluding his or her investigation to the manager, the employee, the Committee and the union local, if any.

## PART V

### SUPERVISION

#### Underground Mines

**5.01.** The manager shall ensure that every person working underground in a mine is under the general supervision of the holder of an underground shift boss certificate.

#### Open Pit Mines

**5.02.** (1) Subject to subsection (2), the manager shall ensure that every person working in the mining activity of an open pit mine is under the supervision of the holder of an open pit shift boss certificate.

(2) Where there are fewer than seven persons working in a sand or gravel quarry or in a rock quarry, the manager shall ensure that they are under the supervision of the holder of a supervisor's certificate, unless the chief inspector requires a shift boss certificate.

#### Supervisors

**5.03.** Within one year after these regulations come into force, the manager shall ensure that every person employed at the mine, other than office employees and those employed underground in mines or in open pit operations, is under the supervision of the holder of a supervisor's certificate level 1.

**5.04.** The manager shall ensure that persons subordinate to the manager and appointed by the manager to give direction to shift bosses and supervisors possess a supervisor's certificate level II within one year after these regulations come into force.

#### Management Structure Chart

**5.05.** (1) The manager shall prepare a management structure chart showing authority and responsibility and where there is more than one shift boss or supervisor on duty at the mine, shall clearly identify the authority and responsibility of each shift boss and supervisor.

(2) The manager shall ensure that the areas of responsibility and authority are not so extensive as to prevent a shift boss or supervisor from diligently carrying out his or her duties concerning health and safety.

**5.06.** The manager shall send to the chief inspector a copy of every management structure chart within 21 days of its preparation or amendment and shall provide copies to the Committee and union local, if any.

#### General Duties of Shift Boss and Supervisor

**5.07.** Every shift boss or supervisor shall, within his or her area of responsibility and authority,

- (a) carry out the duties set out in the Act and these regulations;
- (b) give precedence to the health and safety of persons in his or her charge over any other duties and at the end of his or her shift, communicate with the next shift boss or supervisor all necessary information relating to health and safety concerns;
- (c) ensure that all persons in his or her charge are adequately trained and given clear instructions regarding the work they are to perform;
- (d) ensure compliance with the relevant provisions of the Act and these regulations;

- (e) be knowledgeable about essential safeguards against hazards and about safe working procedures at the worksites for which he or she is responsible so that he or she can routinely assess the safety of the environment and operations affecting persons in those worksites;
- (f) by thorough supervision, protect the health and safety of all persons in the area for which he or she is responsible;
- (g) make himself or herself familiar with all parts of the area for which he or she is responsible including those parts where persons do not normally work and with safe escape routes, refuge stations and other mustering points;
- (h) ensure that there is sufficient safety equipment of appropriate standards for the work being performed;
- (i) expeditiously investigate and address health and safety matters drawn to his or her attention;
- (j) record before the end of every shift in a log-book kept for that purpose, all matters affecting health and safety, making special notes of any unusual or hazardous conditions or deficiencies found during the shift and of any remedial actions taken; and
- (k) read and countersign all reports of the previous shift and discuss any health and safety matters of concern and any unusual or hazardous conditions or deficiencies with persons under his or her control before deploying them to their worksites.

#### Persons Senior to Supervisors

**5.08.** Persons appointed by the manager to give direction to shift bosses and supervisors shall

- (a) carry out such checks as are necessary to ensure that supervision is satisfactory within the person's authority and responsibility and that those supervisors or workers to whom particular tasks have been assigned have been given clear instructions and are carrying out their duties effectively;
- (b) read and countersign daily the log-book referred to in paragraph 5.07(j) and take such remedial actions as may be necessary to deal with health and safety matters of concern and any unusual or hazardous conditions or deficiencies; and
- (c) ensure that the manager is fully informed of any health and safety matters of concern and any unusual or hazardous conditions or deficiencies.

#### Unusual Danger

**5.09.** Work that involves an unusual danger and any emergency situation shall be personally and continually supervised by the manager, a person appointed by the manager to give direction, a shift boss or a supervisor.

#### Unsafe Worksite

**5.10.** Where a worksite becomes or is found to be unsafe at anytime during a shift, the shift boss or supervisor shall take measures for making it safe, and for safeguarding the persons in the worksite while it is being made safe.

#### Designated Person

**5.11.** (1) Where a shift boss is unable to conduct his or her inspection of all the worksites because he or she is involved in the supervision of an unusual danger or emergency situation, he or she shall designate a person to make physical contact with every person at the other worksites.

(2) A person designated under subsection (1) shall, when he or she completes the making of physical contact with every person at the other worksites, report his or her findings to the shift boss responsible for the area.

## PART VI

### TRAINING

#### Duty of Manager

**6.01.** The manager of a mine shall ensure that all employees at a mine are adequately trained to safely perform the work to which they are assigned.

#### Training Program

**6.02.** The manager of a mine shall appoint a competent person as trainer to establish and maintain training programs that are acceptable to the chief inspector.

**6.03.** The training programs required by section 6.02 shall include

- (a) an orientation to the area to which the trainee will be assigned;
- (b) instruction in the Act and these regulations and the applicable responsibilities thereunder;
- (c) the hazards associated with the work and basic instructions in safe work practices;
- (d) instruction in the safety rules of that mine;
- (e) survival mine rescue training for underground employees;
- (f) ventilation techniques for underground employees;
- (g) ground support and control techniques for underground and open pit employees;
- (h) core Workplace Hazardous Materials Information System training;
- (i) use of fire fighting equipment;
- (j) the necessary skills to perform his or her job safely;
- (k) training and evacuation procedures; and
- (l) such other matters as the trainer considers necessary or the chief inspector may require.

**6.04.** (1) The manager shall ensure that training includes provision for the instruction of persons who may have a poor understanding of the language commonly used in the operation of the mine.

(2) Where a person has a poor understanding of the language commonly used in the operation of the mine, the person shall be trained by means of pictures and diagrams with verbal reinforcement.

**6.05.** Training shall be provided to

- (a) all new employees;
- (b) employees being transferred to a new work area; and
- (c) employees operating equipment for the first time.

**6.06.** A new or transferred employee may be exempted from the training programs referred to in section 6.02, where the employee

- (a) produces proof that he or she has successfully completed suitable training during employment at another mine; and
- (b) demonstrates, to the satisfaction of the manager, his or her proficiency in performing safely any work to which he or she will be assigned.

**6.07.** Trainees shall work under the close direction of and within 5 m of a trainer competent to perform the tasks being taught and to give instructions, until the trainer is satisfied that the trainee is competent to perform the work safely without endangering himself or herself or other persons.



**6.08.** The trainer shall establish a method of assessing the progress of a trainee and shall keep a reproducible record of his or her training and the record shall include

- (a) the name of the employee;
- (b) the names of every trainer;
- (c) the number of hours in training; and
- (d) details of training completed.

**6.09.** The training records of each employee shall be maintained at the mine and a written statement of the training received shall be signed by the manager and given to the employee when he or she leaves the employment of the mine.

**6.10** A contractor working at a mine shall ensure that his or her employees are suitably trained to perform their work safely and shall provide to the manager, in writing, the details of the training of the employees.

**6.11.** The manager shall have the training programs referred to in section 6.02 available for implementation

- (a) before the commencement of operations at a new mine; and
- (b) in the case of an existing mine, within one year of the coming into force of these regulations.

**6.12.** Copies of all training records shall be made available to an inspector at his or her request.

## PART VII

### CERTIFICATION

#### Definition

**7.01.** In this Part, "Panel" means the Panel of Examiners established under section 7.02.

#### Panel

**7.02.** A Panel of Examiners is established consisting of

- (a) the chief inspector who shall be the chairperson of the panel; and
- (b) two inspectors appointed by the chief inspector.

**7.03.** The chief inspector may appoint such other persons to the Panel as he considers necessary.

#### Examinations

**7.04.** Candidates shall apply, in writing, to the Panel for the issue of

- (a) a supervisor's certificate, level II;
- (b) a shift boss certificate; and
- (c) a mine surveyor's certificate.

**7.05.** Examinations of candidates for a supervisor's certificate, level II, a shift boss certificate or a mine surveyor's certificate shall be conducted by the Panel.

#### Issue of Certificates

**7.06.** The Panel may authorize the chief inspector to issue a supervisor's certificate, level II, to a person who

- (a) has
  - (i) a minimum of five years practical experience in mining, mineral processing or mine equipment maintenance,

- (ii) other practical experience satisfactory to the Panel relevant to construction on a mine surface, or
- (iii) a minimum of one year practical experience in or about mines and a degree or diploma in mining science or a relevant discipline from an accredited university, college or technical institute;
- (b) where required, **is a holder of a valid Northwest Territories mine rescue certificate from another jurisdiction;**
- (b.1) where required, is the holder of a valid Northwest Territories blasting certificate;**
- (c) is the holder of a first aid certificate to a standard required by the Panel; and
- (d) has passed a written examination set by the Panel on the following subjects:
  - (i) the Mine Health and Safety Act and these regulations,
  - (ii) safe work practices, and
  - (iii) emergency procedures.

**7.07.** The Panel may authorize the chief inspector to issue a shift boss certificate to a person who

- (a) has a minimum of
  - (i) five years practical mining experience, or
  - (ii) one year practical experience in or about mines and a degree or diploma in mining science or a related discipline from an accredited university, college or technical institute;
- (b) has passed, within the previous 12 months, a Northwest Territories mine rescue course or a refresher course or an equivalent course of another jurisdiction, and has received a mine rescue certificate;
- (c) is the holder of a first aid certificate to a standard required by the Panel;
- (d) is the holder of a blasting certificate issued pursuant to section 7.31; and
- (e) has passed a written or **verbal** examination set by the Panel on the following subjects:
  - (i) Mine Health and Safety Act and these regulations,
  - (ii) examination of the workings,
  - (iii) safe work practices, and
  - (iv) emergency procedures.

**7.08.     repealed**

Restricted and Provisional Certificates

**7.09.** Notwithstanding section 7.06, the Panel may authorize the chief inspector to issue a restricted supervisor's certificate, level II, where the type of mine operation does not require the applicant to have all of the qualifications set out in section 7.06 for a supervisor's certificate, level II.

**7.10.** Notwithstanding section 7.07, the Panel may authorize the chief inspector to issue a restricted shift boss certificate where the type of mine operation does not require the applicant to hold all of the qualifications set out in section 7.07 for a shift boss certificate.

**7.11.** The **manager** may issue a provisional supervisor's certificate, level II, to a person who fulfils the requirements of paragraphs 7.06(a) to (c) and who has applied to the Panel for the issue of a supervisor's certificate.

**7.12.** (1) A provisional supervisor's certificate, level II, is valid for the term, not exceeding 90 days, fixed by the **manager** and stated on the face of the certificate.

- (2) The **manager** shall not issue more than one provisional supervisor's certificate, level II, to a person.
- (3) **The manager shall, without delay, send to the chief inspector a copy of every provisional supervisor's certificate, level II, that he or she issues.**

**7.13.** A manager may issue a provisional shift boss certificate to a person who

- (a) has applied to the Panel for a shift boss certificate;
- (b) fulfils the requirements set out in paragraphs 7.07(a) to (d); and
- (c) demonstrates, to the satisfaction of the manager, an adequate knowledge of the Act and the regulations relevant to the authority and responsibility to be assigned to the person.

**7.14.** The manager shall, without delay, send to the chief inspector a copy of every provisional shift boss certificate that he or she issues.

**7.15.** A provisional shift boss certificate is valid for a term, not exceeding 90 days, fixed by the manager who issued the certificate and stated on the face of the certificate.

**7.16.** The chief inspector may extend the term of a provisional shift boss certificate.

**7.17.** A manager shall not issue more than one provisional shift boss certificate to a person in relation to an area of authority and responsibility.

#### Cessation of Validity of Certificates

**7.18.** (1) A supervisor's certificate, level II, ceases to be valid when the holder no longer meets the requirements of paragraph 7.06(b) or (c).

(2) A shift boss certificate ceases to be valid when the holder no longer meets the requirements of paragraph 7.07(b) or (c).

#### Suspension or Cancellation of Certificate

**7.19.** (1) Where, after an investigation, an inspector has reasonable cause to believe that the holder of

- (a) a supervisor's certificate, level II,
- (b) a provisional supervisor's certificate, level II,
- (c) a shift boss certificate,
- (d) a provisional shift boss certificate, or
- (e) a mine surveyor's certificate,

has contravened or failed to comply with a provision of the Act or these regulations or is unfit to carry out his or her duties by reason of incompetence or neglect of duty, the inspector may suspend the certificate.

(2) Where the inspector suspends a certificate under subsection (1), he or she shall

- (a) report the circumstances to the manager;
- (b) make a written report to the chief inspector; and
- (c) give the holder of the certificate written notice of the suspension.

(3) After receiving the inspector's report referred to in subsection (2), the chief inspector shall, without delay, send a copy of the report to the holder of the certificate that has been suspended.

(4) After reviewing an inspector's report sent under subsection (2), the chief inspector

- (a) may investigate the circumstances of the suspension;
- (b) shall give full opportunity to all interested parties to present evidence and make representations; and
- (c) may confirm, vary or terminate the suspension or cancel the certificate.

(5) The chief inspector shall, without delay, send a copy of any decision under subsection (4)

- (a) to the person affected, by registered mail; and

(b) to the manager.

**7.20.** A person who holds a shift boss certificate issued under the Mining Safety Act, R.S.N.W.T., c.M13, shall, unless exempted by the chief inspector, demonstrate to the chief inspector on a date fixed by the chief inspector that is not later than two years after these regulations come into force, that he or she has an adequate knowledge of the Act and these regulations as they relate to his or her duties.

#### Supervisor's Certificate, Level I

**7.21.** (1) Every person who supervises a worksite must possess a supervisor's certificate, level I.

- (2) The chief inspector may issue a supervisor's certificate, level I, to a person who
- (a) has passed an examination on the sections of the Act and these regulations relevant to his or her authority and responsibility; and
  - (b) is the holder of a first aid certificate of the standard required by the chief inspector.

**7.22.** A manager may issue a provisional supervisor's certificate, level I, to a person who

- (a) has applied to the chief inspector for a supervisor's certificate, level I;
- (b) fulfils the requirements set out in paragraph 7.21(2)(b); and
- (c) demonstrates, to the satisfaction of the manager, adequate knowledge of the Act and these regulations as they relate to his or her authority and responsibility.

**7.23.** The manager shall, without delay, send the chief inspector a copy of every provisional supervisor's certificate, level I, issued by the manager.

**7.24.** A provisional supervisor's certificate, level 1, is valid for the term, not exceeding 90 days, fixed by the manager who issued the certificate and stated on the face of the certificate.

**7.25.** The chief inspector may extend the term of a provisional supervisor's certificate, level I.

**7.26.** A manager shall not issue more than one provisional supervisor's certificate, level I, to a person in relation to any one area of authority and responsibility.

**7.27.** A supervisor's certificate, level I, ceases to be valid when the holder no longer meets the requirements of paragraph 7.21(2)(b).

#### Suspension or Cancellation of Supervisor's Certificate, Level I

**7.28.** (1) Where, after an investigation, an inspector has reasonable cause to believe that the holder of a supervisor's certificate, level I, or a provisional supervisor's certificate, level I, has contravened or failed to comply with a provision of the Act or these regulations or is unfit to carry out his or her duties, by reason of incompetence or neglect of duty, the inspector may suspend the certificate and where the inspector does so, he or she shall

- (a) report the circumstances to the manager;
- (b) make a written report to the chief inspector; and
- (c) give the holder of the certificate written notice of the suspension.

(2) The holder of the certificate that has been suspended may appeal the decision of the inspector to the chief inspector within 14 days of receiving written notice of the suspension.

- (3) On receipt of a notice of appeal, the chief inspector
- (a) may investigate the circumstances of the suspension;

- (b) shall give full opportunity to all interested parties to present evidence and make representations; and
- (c) shall confirm, vary or terminate the suspension or cancel the certificate.

(4) The chief inspector shall, without delay, send a copy of a decision made under subsection (3)

- (a) to the person affected, by registered mail; and
- (b) to the manager.

#### Hoist Operator's and Blasting Certificates

**7.29.** A person who wishes to obtain a hoist operator's certificate or a blasting certificate shall apply in writing to the chief inspector for the issue of such a certificate.

#### Hoist Operator's Certificate

**7.30. (1) The chief inspector may issue a hoist operator's certificate to a person who**

- (a) has satisfied the manager of his or her knowledge of hoisting operations;**
- (b) has attained the age of 20 years;**
- (c) gives proof of training to operate a hoist at a mine;**
- (d) has received instruction in the use of self-contained breathing apparatus;**
- (e) has a valid medical certificate issued by a medical practitioner stating that to the best of the practitioner's knowledge the person is not subject to any infirmity to such a degree as to interfere with the safe discharge of that person's duties; and**
- (f) has passed a written examination set by the chief inspector.**
- (g) is fluent in the language commonly used at the mine.**

**(2) In order to maintain a valid hoist operator's certificate, the holder of the certificate must provide to the chief inspector**

- (a) where required to use self-contained breathing apparatus, proof of having received semi-annual instructions in the use of self-contained breathing apparatus; and**
- (b) a valid annual medical certificate issued by a medical practitioner stating that to the best of the practitioner's knowledge the person is not subject to any infirmities to such a degree as to interfere with the safe discharge of that person's duties.**

#### Blasting Certificate

**7.31.** The chief inspector may issue a blasting certificate to a person who

- (a) has a minimum of one year's mining experience of which at least six months has been spent assisting a qualified blaster;
- (b) is able to give and receive orders in the language commonly used in the mine;
- (c) has passed a written and oral examination set by the chief inspector and has satisfied the chief inspector that he or she is able to perform the duties of a blaster.
- (d) **repealed**

**7.32.** A blasting certificate may contain any restriction the chief inspector considers necessary.

#### Provisional Blasting Certificates

**7.33.** A manager may issue a provisional blasting certificate to a person who

- (a) has applied to the chief inspector for a blasting certificate;
- (b) fulfils the requirements set out in section 7.31; and

- (c) demonstrates, to the satisfaction of the manager, adequate knowledge of the Act and these regulations as they relate to the authority and responsibility to be assigned to the person.

**7.34.** The manager shall, without delay, send to the chief inspector a copy of every provisional blasting certificate issued by the manager.

**7.35.** A provisional blasting certificate is valid for a term, not exceeding 90 days, fixed by the manager who issued the certificate and stated on the face of the certificate.

**7.36.** The chief inspector may extend the term of a provisional blasting certificate.

**7.37.** A manager shall not issue more than one provisional blasting certificate to a person.

#### Suspension and Cancellation of Blasting Certificate

**7.38.** Where, in the opinion of the manager, a holder of a blasting certificate

- (a) has failed to comply with or has contravened any provision of these regulations that relates to drilling or blasting,
- (b) has acted, in a careless manner with respect to explosives or detonators, or
- (c) is unfit to perform his or her blasting duties,

the manager shall suspend the holder of the certificate from his or her blasting duties and give the chief inspector written notice of the suspension within 24 hours of the suspension.

**7.39.** Where, in the opinion of an inspector, a holder of a blasting certificate

- (a) has failed to comply with or has contravened any provision of these regulations that relates to drilling or blasting,
- (b) has acted in a careless manner with respect to explosives or detonators, or
- (c) is unfit to perform his or her blasting duties,

the inspector may suspend or cancel the blasting certificate.

**7.40.** The inspector shall, without delay, send a notice of suspension or cancellation of a blasting certificate to the holder of the certificate.

**7.41.** Within 14 days of receipt of the notice referred to in section 7.40, the holder of the certificate may file a notice appealing the decision with the chief inspector.

**7.42.** On receipt of a notice of appeal under section 7.41, the chief inspector

- (a) may investigate the circumstances of the suspension or cancellation;
- (b) shall give full opportunity to all interested parties to present evidence and make representations; and
- (c) shall confirm, vary or terminate the suspension or confirm or terminate the cancellation.

**7.43.** The chief inspector shall, without delay, send a copy of the decision arising from an investigation under section 7.42

- (a) to the holder of the certificate, by registered mail; and
- (b) to the manager.

#### Suspension and Cancellation of Hoist Operator's Certificate

**7.44.** Where, in the opinion of the manager, a holder of a hoist operator's certificate

- (a) has failed to comply with or has contravened any provision of these regulations relating to hoisting,
- (b) has acted in a careless manner while in charge of a hoist, or
- (c) is unfit to perform his or her duties,

the manager shall suspend that person from his or her duties and give the chief inspector written notice of the suspension within 24 hours of the suspension.

**7.45.** Where, in the opinion of an inspector, a holder of a hoist operator's certificate  
(a) has failed to comply with or has contravened any provision of these regulations relating to hoisting,  
(b) has acted in a careless manner while in charge of a hoist, or  
(c) is unfit to perform his duties,  
the inspector may suspend or cancel the hoist operator's certificate.

**7.46.** The inspector shall, without delay, send a notice of suspension or cancellation of a hoist operator's certificate to the holder of the certificate.

**7.47.** Within 14 days of receipt of the notice referred to in section 7.46, the holder of the certificate may file a notice appealing the decision of the inspector with the chief inspector.

**7.48.** On receipt of a notice of appeal under section 7.47 the chief inspector  
(a) may investigate the circumstances of the suspension or cancellation;  
(b) shall give full opportunity to all interested parties to present evidence and make representations; and  
(c) shall confirm, vary or terminate the suspension or confirm or terminate the cancellation.

**7.49.** The chief inspector shall, without delay, send a copy of every decision under section 7.48 to  
(a) the holder of the certificate, by registered mail; and  
(b) the manager.

#### General

**7.50.** Every holder of a certificate issued by the chief inspector under these regulations shall, on a date fixed by the chief inspector that is not later than five years after the day on which the certificate is issued, demonstrate to the satisfaction of the chief inspector, that he or she has an adequate knowledge of the Act and these regulations as they relate to his or her duties.

**7.51.** Where a holder of a certificate fails to demonstrate that he or she has an adequate knowledge of the Act or these regulations in so far as they relate to the duties and responsibilities of the holder, the chief inspector shall  
(a) suspend the certificate until such time as the holder demonstrates such knowledge; or  
(b) cancel the certificate.

**7.52.** When a person commences employment at a mine in a position that requires the person to hold a certificate issued under these regulations, that person shall deliver his or her certificate to the manager before undertaking any duties in relation to the position and the manager shall keep the certificate in safekeeping during the employment of that person.

**7.53.** The manager shall return a certificate delivered pursuant to section 7.52 to the person who delivered it when the employment of that person terminates unless the certificate has been suspended or cancelled.

**7.54.** Where a certificate issued under these regulations is suspended or cancelled, the manager shall, without delay, send the certificate by registered mail to the chief inspector.

#### PART VIII

#### PERSONNEL SAFETY

#### DIVISION 1

## GENERAL

### Age

**8.01.** No person under the age of 16 years shall be employed in or about a mine and no person under the age of 18 years shall be employed underground or at the working face of any open cut workings, pit or quarry.

### Authority to Enter a Mine

**8.02.** (1) Other than an inspector and persons accompanying an inspector, only persons authorized by the manager shall enter or be allowed to enter a mine, and a notice to this effect shall be posted at every road entrance to the mine, and in the case of an underground mine, at every portal entry and at the top of every shaft.

(2) Unless authorized by the manager, no persons shall enter or leave a mine except by a recognized means of entry or egress.

### Tallying System

**8.03.** (1) The manager shall establish and maintain a procedure to record every person going underground in a mine and every person returning to the surface from an underground mine.

(2) Every person who goes underground in a mine and every person who returns to the surface from an underground mine shall check in and check out in accordance with the procedure established pursuant to subsection (1).

### Personal Protective Equipment

**8.04** If it is not reasonably practicable to protect the safety and health of workers by design of the work place and work processes and by implementing suitable work practices and administrative controls, the manager shall

- (a) provide properly fitted personal protective equipment required by these regulations or recommended by the Committee;
- (b) ensure that persons are given instruction in the use and maintenance of the personal protective equipment, including instruction in the location of the equipment, the reasons for its use and its limitations; and
- (c) ensure that the personal protective equipment is adequate for its purpose.

**8.05** (1) A protective hat that meets the requirements of CSA Standard Z-94.1-M92, Industrial Protective Headgear, and that is suitable for the type of work or activity being performed, shall be worn by every person at a mine where there is a risk of head injury or where the manager so requires.

(2) Where conditions may cause a protective hat to be dislodged, a device that prevents the hat being dislodged shall be incorporated into the hat and shall be used.

**8.06.** Protective footwear that meets the requirements of CSA Standard Z195-M92, Protective Footwear, and that is suitable for the type of work or activity being performed, shall be worn by every person at a mine where there is a risk of foot injury or where the manager so requires.

**8.07.** (1) Every person underground at a mine shall at all times carry a self-rescuer of a type acceptable to the chief inspector on his or her person.



(2) Every self-rescuer carried in accordance with subsection (1) shall be tested in accordance with the manufacturer's recommendations at intervals not exceeding one year, and a self-rescuer that does not meet the recommendations of the manufacturer shall be replaced by the manager.

**8.08.** Where there may be a hazard to an employee because of hand contact with harmful chemicals or with vibratory equipment, suitable hand protection shall be provided.

#### Working Alone

**8.09. (1) Where a person working in a mine is not in frequent communication with or is not within sight or sound of another person, the manager shall ensure that such person is trained and qualified and is visited or contacted at the work location by a person appointed for that purpose, at intervals of two hours or more frequently as the nature and place of the person's work dictates.**

**(2) Where it may not be practicable to conform to the requirements of subsection (1), the manager shall, in consultation with the Committee, establish a procedure approved by the chief inspector for the protection of a person working in a mine who is not in frequent communication with or is within sight or sound of another person.**

#### Falling Objects

**8.10. (1)** No person shall be allowed in any location at a mine where persons are working overhead unless adequate protection is provided for his or her safety.

(2) In parts of the mine where construction is taking place and there is danger of material falling into work areas,

- (a) those areas shall be fenced off against inadvertent access by persons and warning signs shall be prominently displayed on all sides and approaches;
- (b) protective canopies shall be installed; or
- (c) catch platforms shall be provided that must
  - (i) be installed not more than 7.6 m below the level from which material could fall and extend outward from the structure for at least 2.4 m, and
  - (ii) slope inward toward the structure and have baffles to prevent material falling from the catch platform.

(3) Notwithstanding subparagraph (2)(c)(ii), baffles are not required where material netting is used as a catch platform.

#### Fall Arrest System

**8.11. (1)** Subject to subsection (5), where a person is exposed to the hazard of falling more than 3 m, a fall arresting device shall be provided to the person and he or she shall use the device.

(2) The fall arresting device required by subsection (1) shall comply with the relevant design and performance requirements of CSA Standard Z259.1-1976, Fall Arresting Safety Belts and Lanyards for the Construction and Mining Industries.

(3) Safety belts, harnesses, lanyards and lifelines shall not be knotted and shall not be allowed to become knotted or damaged.

(4) When in use with a fall arresting device, a lifeline shall be anchored so that a person cannot fall, free of arrest, for more than 1.22 m, and the lifeline shall be connected to an object that is free from sharp edges and capable of resisting the force of an arrest.

(5) Subsection (1) does not apply to a person employed in shaft sinking where measures are in effect to provide equal or greater protection against falling.

#### Evacuation of Persons from Surface Buildings

**8.12. (1) Where a building or structure is under construction, the manager shall, in consultation with the Committee, develop a procedure for the evacuation of an injured person from any level of the building or structure that is acceptable to the chief inspector.**

**(2) The procedure referred to in subsection (1) shall provide for ready access of emergency transportation equipment.**

**(3) The manager shall ensure that every worker is trained in the procedure developed under subsection (1).**

#### Hazards

**8.13.** No person shall be transported in the box of a pick-up or service truck and no person shall ride in a standing position in any vehicle.

**8.14.** Where persons are required to work over water which presents a risk of drowning, the manager shall, in consultation with the Committee, develop a procedure for the safety and rescue of persons from the water that is acceptable to the chief inspector..

**8.15. (1)** Where there is a risk of a person coming into contact with moving parts of machinery or with electrically energized equipment or where the work process is such that a similar hazard exists, the person

(a) shall wear clothing that fits closely about the body;

(b) shall not wear dangling neckwear, bracelets, wrist-watches, rings or similar articles; and

(c) shall confine cranial and facial hair or wear it at a length which will prevent it from being snagged or caught.

(2) Notwithstanding subsection (1), a person may wear a medic alert bracelet if the bracelet is secured with transparent rubber bands that fit snugly over the bracelet.

**8.16. (1)** All openings, sumps, vessels, bins, hoppers, elevated platforms or pits that constitute a hazard shall be adequately fenced or otherwise guarded.

(2) Subsection (1) does not apply to grease pits.

#### Water in Ore or Waste Pass

**8.17 (1)** No person shall introduce water into an ore or waste pass, a loading pocket, hopper, storage bin or a completed large diameter bore hole for any purpose unless the introduction is in accordance with procedures prepared by the manager and discussed with the Committee.

(2) A copy of the procedures referred to in subsection (1) shall be submitted to the chief inspector, and no water shall be introduced into an ore or waste pass, a loading pocket, hopper, storage bin or a completed large diameter bore hole until the procedure referred to in subsection (1) has been approved by the chief inspector.

(3) Where any ore or waste pass is found to contain water or saturated material that will flow, the manager shall develop procedures for the safe removal of such water or saturated material and shall give a copy of the procedures to the Committee.

## Handling of Bulk Material

**8.18.** (1) Where a person may be endangered by the withdrawal, collapse, shifting or movement of bulk material such as rock, ore or other material in a stope, pass, chute or other storage area,

- (a) procedures shall be established respecting the precautions to be taken during and after removal of material therefrom; and
- (b) a person entering the affected area from above shall wear a fall arrest system.

(2) When pulling a chute, no person shall be positioned so that his or her access to an exit from the area may be blocked by an uncontrolled run of material, water or slime.

(3) A mechanical locking device shall be installed on power operated chute gates on an overcut, so that the gate may be locked in the open or closed position.

(4) Where an area is likely to be affected by the withdrawal or the collapse, shifting or movement of bulk material, the manager shall post warning signs and erect barriers to protect the area against inadvertent access.

(5) When a power operated safety guard or gate is used, the owner shall design and install the power operated safety guard or gate to minimize hazards when the power fails.

**8.19.** Where a person is working on top of bulk material in any silo, bin, hopper or other container or structure,

- (a) the person shall use a fall arrest system; and
- (b) at least one other person equipped with a suitable alarm shall be in constant attendance outside the container or structure.

## Stockpiles

**8.20.** Stockpiles of unconsolidated material shall be

- (a) inspected regularly for hazardous conditions by an authorized person; and
- (b) made safe before a person is allowed to work close to or on top of the stockpile.

**8.21.** Bulk or packaged material shall be piled or stacked in a manner to prevent accidental movement or collapse.

**8.22.** Where a tunnel is used under a stockpile for the purpose of reclaiming material from the stockpile, at least two exits shall be provided from the tunnel.

## Movement of Bulk Materials

**8.23.** Where there are chutes for the control of ore, waste or other material, the manager shall

- (a) ensure that all such chutes are so constructed and their parts and controls are so arranged that persons are safe from unexpected surges or spillage of material; and
- (b) establish a procedure to be followed in the event of unexpected surges or spillage.

**8.24.** Where ore, waste, fill or other material is pulled from a chute or drawpoint and the settling of the broken material above the chute or drawpoint may endanger a person, the manager shall ensure that

- (a) every person in the area is notified of the hazard;
- (b) the area that may be affected by settling of the material is safeguarded by signs, barricades or guarding; and
- (c) the area is examined and made safe before the signs and barricades are removed.

**8.25.** No worker shall enter, or be permitted by the manager to enter, any drawpoint, chute, transfer raise or other mine opening that is used for the passage of ore, rock or other material by gravity and in which such material is hung up.

Precautions Against Water in Raises, Ore Passes, etc.

**8.26.** (1) The manager shall establish procedures to prevent accumulations of water in raises, ore and waste passes, chutes and other mine workings used for the storage or transfer of ore, waste or fill.

(2) Where for any reason a raise, ore or waste pass, chute or other mine working containing ore, waste or fill may also contain an accumulation of water, no employee shall pull or be permitted by the manager to pull material from that place until such time as the manager has established a safe procedure for doing that work.

(3) The manager shall send a copy of the procedures referred to in subsections (1) and (2) to the Committee for review.

## DIVISION 2

### CONFINED SPACES

#### Definitions

**8.27.** In this Division,

"confined space" means a tank, process vessel, underground vault, tunnel or other enclosure that is not designed or intended for human occupancy and that a person would only enter if there were work to be done.

#### Procedures

**8.28.** (1) The manager shall ensure that procedures are developed and implemented for work in confined spaces where oxygen deficient, toxic, explosive or flammable atmospheres might be encountered.

(2) The procedures required by subsection (1) shall be sent to the chief inspector for his approval.

- (3) The procedures required by subsection (1) shall provide for
- (a) the use of lifelines and safety belts and for the stationing of a person outside the confined space to check on the persons in the confined space at suitable intervals;
  - (b) where lifelines and safety belts cannot be used, the stationing of two persons, with respiratory protective equipment and capable of performing a rescue, outside the confined space in which persons are working to visually check the persons in the confined space at frequent intervals;
  - (c) maintenance of an effective means of communication between persons inside and outside the confined space;
  - (d) specified time intervals for making periodic visual contact with persons inside the confined space;
  - (e) specific procedures to be followed whenever welding or burning operations are to be conducted in the confined space;
  - (f) provision of appropriate breathing apparatus at every confined space in which persons are working and provision for the ready availability of persons trained in its use;

- (g) provision for compressed air used for breathing complying with the requirements of the standard CAN-3-Z180.1-M85, Compressed Breathing Air and Systems;
- (h) disconnecting, blanking or sealing pipes carrying substances that could be hazardous to the persons entering the confined space;
- (i) the method of purging and ventilation to provide a safe atmosphere inside the confined space;
- (j) specific time intervals for testing the atmosphere in the confined space during work in progress;
- (k) recording the results of tests taken under paragraph (j) in a log-book; and
- (l) action to be taken in the event of a power failure.

#### Test of Atmosphere in Confined Space

**8.29.** A person without self-contained breathing apparatus shall not enter a confined space in which a harmful atmosphere might exist or develop until

- (a) tests have been made to determine the nature and quantity of harmful vapours, gases, fumes, mists, dusts, and the oxygen content of the atmosphere inside the confined space and the test results have been recorded in a log-book kept for that purpose;
- (b) the procedures required by section 8.28 have been read and understood by the person and the required emergency and rescue procedures are in place; and
- (c) the confined space is being ventilated continuously by a natural or forced ventilation system such that
  - (i) the atmosphere in the confined space is no longer considered harmful according to the standards specified in these regulations, and
  - (ii) the oxygen content of the atmosphere inside the confined space is not less than 19%.

**8.30.** (1) Where any test or examination indicates a harmful atmosphere or the presence of a harmful substance in a confined space

- (a) every person working in the confined space shall be immediately withdrawn; and
- (b) the confined space shall be ventilated or cleaned or both and re-tested or re-examined.

(2) No person shall enter a confined space where tests have indicated the presence of a harmful atmosphere or a harmful substance unless

- (a) the confined space is being ventilated in accordance with paragraph 8.29(c); or
- (b) the person is wearing protective equipment as required by subsection (3) and the other requirements of that subsection are met.

(3) Where tests made under section 8.29 indicate the presence of harmful or explosive substances in a confined space and it is not practicable to provide a safe, respirable atmosphere,

- (a) the persons entering the confined space shall wear self-contained breathing apparatus and personal protective equipment;
- (b) the concentration of flammable substances shall be maintained below 20% of the lower explosive limit as determined by repeated testing;
- (c) where flammable substances exist every possible source of ignition shall be eliminated by the use of non sparking tools and intrinsically safe electrical equipment; and
- (d) the persons entering shall be attended by two designated persons who
  - (i) shall be stationed immediately outside the confined space,
  - (ii) shall visually check on those persons in the confined space at frequent intervals, and
  - (iii) shall be equipped for, and be capable of performing, a rescue.

## DIVISION 3

### EMERGENCY PROCEDURES

#### Definitions

**8.31.** In this Division,

"key process person" means a person who is in control of a continuous operating process such as a mill or concentrator;

"procedure" means the procedure the manager prepares pursuant to subsection 8.32(1).

**8.32.** (1) The manager shall prepare a procedure for dealing with any emergency that is likely to occur at the mine.

(2) The procedure shall specify the organization and procedures for handling sudden unexpected situations that require immediate attention.

(3) The manager shall involve the Committee in the preparation of the procedure.

(4) The manager shall send a copy of the procedure to the chief inspector.

**8.33.** The procedure shall include

- (a) a vulnerability assessment listing the potential hazards, both natural and technological;
- (b) the consequences of each major hazard that has been identified;
- (c) the procedures to be adopted to safeguard persons;
- (d) an inventory and location of resources required to support the planned action;
- (e) the proposed organization and allocation of responsibility to deal with an emergency;
- (f) the details of external sources of assistance; and
- (g) means of notification, in conjunction with the R.C.M.P., of immediate next-of-kin, where a person is seriously injured or killed.

**8.34.** The manager shall ensure that persons are instructed in the details for the safe evacuation of the mine or a part of the mine and these details shall include

- (a) the identification of escape routes;
- (b) the location of refuge stations;
- (c) the proper use of emergency equipment; and
- (d) the nature of the warning system.

**8.35.** The manager shall develop and maintain a system acceptable to the chief inspector for warning all employees, whether underground or in buildings on the surface, of an emergency requiring prompt evacuation of their worksites.

**8.36.** A test of the warning system referred to in section 8.35 that does not require the evacuation of key process persons shall be conducted at least every 12 months on a production shift, and the manager shall ensure that the key process persons not involved in the evacuation are knowledgeable of the warning system and the evacuation procedure.

**8.37.** A report of the results of all emergency warning system tests shall be sent to the chief inspector and a copy shall be given to each member of the Committee.

## DIVISION 4

### FIRST AID

**8.38.** To provide for the proper treatment and transportation of persons who may be injured at work, the owner shall supply and make readily accessible to employees, as a minimum, the first aid equipment, supplies, facilities and services specified by this Division.

**8.39.** First aid equipment, supplies and facilities shall be kept clean, dry and ready for use.

**8.40.** First aid equipment shall meet the requirements of Schedules 1, 2 and 3 unless these regulations specify otherwise or unless the chief inspector orders otherwise.

**8.41.** Each employee shall be made aware of the location of first aid for his or her worksite and how to call for first aid.

**8.42.** Signs clearly indicating the location of, and how to call for, first aid shall be posted conspicuously throughout the mine.

**8.43.** The manager shall ensure that a first aid facility is in the charge of a person who

- (a) holds a valid St. John Ambulance Advanced First Aid, Level I qualification, or an equivalent or greater qualification;
- (b) shall only perform duties which allow the prompt response to a request for first aid and the rendering of first aid in a clean and sanitary condition; and
- (c) is suitably trained to administer first aid in any area of a mine or exploration site.

**8.44.** There shall be an effective means of communication between the person in charge of the first aid facility and all worksites to be served.

**8.45.** There shall be effective means of communication for the person in charge of the first aid facility to summon additional assistance.

**8.46.** The first aid facility shall be adequately illuminated, heated and ventilated.

**8.47.** (1) First aid equipment and supplies shall be provided and maintained at the following places:

- (a) refuge stations;
- (b) shaft stations;
- (c) underground and surface workshops;
- (d) a worksite where diamond drilling equipment is used;
- (e) collars;
- (f) control rooms in mills and concentrators; and
- (g) other places where required by an inspector.

(2) The equipment and supplies required by subsection (1) shall meet the requirements of Schedule 1, and shall be checked weekly and maintained or replenished as necessary.

**8.48.** Where the time for the surface transportation of a person from a mine to the nearest hospital exceeds 20 minutes, the owner shall provide a first aid facility that is provided with first aid equipment and supplies that meet the requirements of Schedule 2.

**8.49.** Where the time for stabilization treatment of an injured person may be longer than two hours, unless circumstances of the injury dictate otherwise, suitable arrangements shall be made to ensure the comfort and treatment of the injured patient.

**8.50.** Where the time for the surface transportation of a person from a mine to the nearest hospital is 20 minutes or less, the owner shall provide a first aid facility that is provided with the first aid equipment and supplies that meet the requirements of Schedule 3.

**8.51.** At a mine

- (a) all persons engaged in supervision,
- (b) all persons engaged in mine rescue,
- (c) all persons who are members of fire response teams,
- (d) one-fifth of the total number of the employees underground, and
- (e) one-tenth of the total number of employees on the surface,

shall be trained in first aid and hold a current and valid certificate at least equivalent to the St. John Ambulance Standard First Aid certificate, and shall be trained in cardiac pulmonary resuscitation or to such other level as may be agreed to by the chief inspector.

DIVISION 5

MINE EMERGENCIES

Mine Rescue Stations and Equipment

**8.52.** Mine rescue stations shall be established, equipped, operated and maintained at every operating mine as directed by the chief inspector.

**8.53.** (1) The manager shall appoint a person who is qualified in mine rescue instruction to be responsible to maintain the mine rescue equipment in good and serviceable condition at all times and to train mine rescue teams.

(2) The manager shall appoint a person under subsection (1) who holds a valid mine rescue instructor's certificate issued by the chief inspector.

**8.54.** Where there is no person available to give mine rescue instruction at a mine, the chief inspector may provide maintenance of mine rescue equipment and training of mine rescue teams for a limited period, and the cost for this service shall be recovered from the owner.

Employees to be Trained

**8.55.** The manager shall ensure that a sufficient number of employees are trained and certified in mine rescue.

**8.56.** The manager shall ensure that a sufficient number of qualified persons are trained as mine rescue team members and are readily available at the mine when persons are normally at work in the mine.

**8.57.** Where an inspector is of the opinion that the number of employees trained and certified in mine rescue at a mine is insufficient, the inspector may order more to be trained.

Practices

**8.58.** (1) The manager shall ensure that every mine rescue team member practises for not less than eight hours during each two month period or for such other number of hours as is agreed to by the chief inspector.

- (2) No person is qualified to be a mine rescue team member unless that person
  - (a) has been certified within the last 12 months, by a physician or by a nurse in charge of a nursing station, to be fit to work in breathing apparatus under arduous conditions;
  - (b) has a valid mine rescue certificate issued by the chief inspector; and
  - (c) has taken part in the practice sessions required by subsection (1).



(3) The person appointed by the manager to train mine rescue teams shall keep a record of all certificates held by persons referred to in subsection (2) and the practice sessions held in accordance with subsection (1).

(4) A copy of the records required to be held under subsection (3) shall be made available to an inspector when the inspector so requests.

#### Mine Rescue Operations

**8.59.** The manager shall prepare a procedure setting out the duties of mine rescue teams and other personnel in the event it is necessary to call the teams out in an emergency.

**8.60.** The manager shall make arrangements with managers of other mines for assistance in the event of an emergency and those arrangements shall be set out in the procedure referred to in section 8.59.

**8.61.** The manager shall send a copy of the procedure referred to in section 8.59  
(a) to the chief inspector for approval; and  
(b) to the Committee.

**8.62.** The manager shall ensure that every person who has duties under the procedure referred to in section 8.59 is instructed in his or her duties.

**8.63.** The manager shall appoint a qualified person to supervise all mine rescue work and recovery operations conducted at a mine and the person so appointed shall supervise all such work and operations.

**8.64.** (1) The manager shall  
(a) not permit any person to take part in a rescue operation involving the use of breathing apparatus except as a member of a mine rescue team of no less than five mine rescue persons;  
(b) appoint a qualified team captain who shall have direct control of and be responsible for the safety of the team and shall not take part in any other work during a rescue operation other than that directly involving the safety of the team;  
(c) not permit a rescue operation involving the use of breathing apparatus to proceed unless a complete back up team is immediately available at the place designated as the fresh air base; and  
(d) make arrangements for all mine rescue team members who have returned to the fresh air base to be examined by a qualified medical attendant before being allowed to wear breathing apparatus again.

(2) Notwithstanding paragraph (1)(a), the chief inspector may permit a mine rescue team to have fewer than five members.

(3) In this section, "fresh air base" means a place at a mine, on the surface or underground as the conditions may require, that is in fresh air or is supplied with fresh air, from which mine rescue and recovery work can be conducted in an area with an irrespirable atmosphere.

#### Mine Rescue Plans

**8.65.** The manager shall ensure that the plans required by paragraph 1.119(f) are readily available for the use of mine rescue teams.

#### Refuge Stations

**8.66. The manager shall ensure that a refuge station is located within a 1 km. Distance from an active workplace in an underground mine.**

**8.67.** The chief inspector may direct a manager to provide and maintain refuge stations in as many locations as the chief inspector considers necessary.

**8.68.** Sections 8.66 and 8.67 do not apply during shaft sinking operations for initial development of a mine.

**8.69.** Every refuge station shall be

- (a) clearly identified;
- (b) constructed of non-combustible material; and
- (c) of sufficient size to accommodate all persons in the vicinity.

**8.70.** The manager shall submit for acceptance of the chief inspector a plan for the construction and equipping of refuge stations and a copy shall be given to the Committee.

**8.71.** The manager of a mine shall ensure

- (a) that a refuge station is equipped with
  - (i) a supply of potable water,
  - (ii) a means of communicating with the mine rescue station in an emergency or other situation,
  - (iii) general lighting,
  - (iv) seating capacity for as many persons as the refuge station is designed to shelter,
  - (v) an adequate supply of door sealant to stop air from entering the refuge station,
  - (vi) a sealable container that can be used as a toilet,
  - (vii) two blankets, adequately wrapped to keep them clean and dry, and a stretcher,
  - (viii) a copy of the procedures for fire fighting underground and a plan showing the ventilation system and routes to the escape exits, both of which are to be posted,
  - (ix) at least one first aid kit that meets the requirements of Schedule 1,
  - (x) where required,
    - (A) a source of heat to maintain a minimum temperature of 10 °C in the refuge station, or
    - (B) if the heat referred to in clause (A) may, in the opinion of an inspector, cause ground instability, warm suits sufficient to prevent hypothermia for as many persons as the refuge station is designed to shelter,
  - (xi) where the refuge station is underground, an air supply independent of the mine air system and designed to provide a minimum of 12 hours supply of air for as many persons as the refuge station is designed to shelter, and
  - (xii) suitable equipment for monitoring the air quality each hour or at lesser intervals if required;
- (b) that the equipment and provisions referred to in paragraph (a) are maintained for immediate use and are examined at least weekly to ensure that the refuge station is equipped as required and that the equipment is in good working order;
- (c) that reproducible maintenance records are kept that set out the results of each examination done under paragraph (b) and the name of the person who did the examination;
- (d) that suitable signs showing the direction of airflow and the routes to refuge stations and escape exits are posted at all junctions leading from worksites; and
- (e) that a code of conduct for persons occupying a refuge station is posted in each refuge station.

## Hoist Operator Training

**8.72.** The manager shall ensure that every hoist operator and cage tender who may be required to use closed circuit demand breathing apparatus is trained in its proper use.

## Survival Rescue Procedures

**8.73.** The manager shall ensure that all persons who are required to work underground are

- (a) trained in survival rescue procedures, including the use of self-rescue apparatus acceptable to the chief inspector; and
- (b) retrained annually.

## Instructor Emergency Procedures

**8.74.** The manager of an open pit mine shall appoint a qualified person to instruct and train personnel in emergency rescue techniques.

## Surface Emergency

**8.75.** The manager of a surface mine shall ensure that properly maintained equipment and trained personnel are available to respond to a fire, explosion, or dangerous incident while the mine is in operation.

## PART IX

### WORKING ENVIRONMENT AND INDUSTRIAL HYGIENE

**9.01.** In this Part,

"hazard analysis" means the process of identifying, documenting and eliminating or minimizing potential hazards involved in performing the steps of an operation;

"immediately dangerous to life or health" or "IDLH" means a situation where the release or accumulation of toxic, flammable or inert air contaminants or a change in the normal air concentration of oxygen may result in

- (a) a fatal injury to a person who does not have respiratory protection,
- (b) irreversible or serious harm to the health of a person, or
- (c) the incapacitation of a person;

"special task" means a task that is not routinely performed and that may involve an unusual health or safety hazard.

## Exposure Levels

**9.02.** (1) Employees shall not be exposed to airborne concentrations of chemical or physical substances in excess of those specified in the 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices published by the American Conference of Governmental Industrial Hygienists.

(2) Where shifts are worked longer than eight hours a day or more than 40 hours a week, the airborne concentration of chemical and physical substances shall not exceed the threshold limit value established under the formula set out in Schedule 4.

**9.03.** (1) The manager shall ensure that a hazard analysis is performed annually and where the analysis shows that it is necessary, the manager shall

- (a) implement measures to reduce the effect at a worksite of potentially hazardous agents and conditions on the health and safety of employees;

- (b) institute engineering controls to ensure that employees are not exposed to a level of any physical, chemical or radiation hazard in excess of the limits in the regulations; and
- (c) where the necessary engineering controls required by paragraph (b) cannot be achieved, inform the Committee which shall investigate the situation and make recommendations to the manager.

(2) The manager shall inform the chief inspector in writing of any proposed action following receipt of the recommendations of the Committee under subsection (1) and shall send details of any proposed action to the Committee and the chief inspector.

#### Workplace to be Hazard Free

**9.04.** The manager shall develop and implement an effective housekeeping program to ensure that

- (a) all worksites and travelways are maintained in a safe condition;
- (b) materials and equipment are stored in a manner so as not to endanger persons; and
- (c) appropriate action is taken whenever necessary to maintain a hazard-free environment.

#### Hazard Analysis

**9.05.** (1) Before special tasks may be performed, the manager shall ensure that a hazard analysis is conducted

- (a) identifying and defining each operation;
- (b) differentiating the steps involved in each operation; and
- (c) determining the existing or potential hazards inherent in each step.

(2) The manager shall prepare safe operating procedures for special tasks, which procedures shall include the elimination or minimizing of hazards by

- (a) engineering controls;
- (b) job training; and
- (c) use of protective equipment.

(3) The manager shall ensure that the procedures referred to in subsection (2) are reviewed annually.

(4) The manager shall prepare a report on the review required by subsection (3) and shall refer it to the Committee for review within three months of the date of the review.

#### IDLH Situations

**9.06.** (1) For a situation that may be immediately dangerous to life or health, a manager shall

- (a) provide a monitoring and an alarm system to warn persons of the development of the situation;
- (b) maintain and test the monitoring and alarm systems in accordance with procedures prepared in consultation with the Committee;
- (c) record and investigate with a worker representative and management representative of the Committee the events that triggered the alarm of the IDLH situation;
- (d) provide for and maintain clear escape routes; and
- (e) for surface operations, provide appropriate emergency respiratory equipment in readily accessible locations.

(2) The manager shall

- (a) where atmospheres and dangerous work areas constitute an IDLH situation, provide positive-pressure self-contained breathing apparatus or combination positive-pressure airline respirators with an auxiliary self-contained air supply;
- (b) provide a means whereby persons in a developing or an actual IDLH situation can communicate the need for rescue or immediate action;
- (c) prepare procedures and provide training on the proper measures to be followed in meeting an IDLH situation, including the identification and use of escape routes, the location and proper use of respiratory equipment and the use of the communication system; and
- (d) test the procedures prepared under paragraph (c), at intervals that do not exceed 12 months.

(3) The manager shall post in a conspicuous place, at readily accessible locations, essential details of the hazards of a worksite and of the procedures prepared under paragraph 2(c).

## HAZARDOUS MATERIALS AND WASTE

### Asbestos

- 9.07.** (1) The manager shall ensure that
- (a) as effective, less hazardous, asbestos-free substitutes become available for such items as brake lining, insulation and fire retardant materials, they are used;
  - (b) where there is no substitute available for an asbestos-containing material, a procedure acceptable to the chief inspector is developed to protect the health of persons using, maintaining or exposed to such material;
  - (c) notwithstanding paragraph (b), items containing crocidolite asbestos are not used at a mine;
  - (d) spraying of asbestos or material containing asbestos is prohibited; and
  - (e) protective clothing and equipment made of material containing asbestos is used and maintained in such a manner as to prevent the release of asbestos fibres.

(2) Where any work involves the use, handling or disposal of asbestos or materials containing asbestos the manager shall develop procedures acceptable to the chief inspector for the use, handling or disposal of asbestos or materials containing asbestos.

(3) Subsections (1) and (2) do not apply to the mining and processing of asbestos at an asbestos mine.

### Storage of Hazardous Materials

**9.08. (1) The manager shall ensure that all dangerous or potentially hazardous materials or substances, including arsenic dust, are stored in designated storage areas located on the surface or underground acceptable to the chief inspector that are**

- (a) clearly identified by signs, placards or similar devices;
- (b) well ventilated to prevent any accumulation of dangerous fumes and so arranged that incompatible materials that could produce a harmful reaction if combined, are adequately separated; and
- (c) secured and accessible only to authorized persons.

(2) The manager shall ensure that all dangerous or potentially hazardous materials are stored in containers that are

- (a) designed, constructed and maintained in such a manner as to ensure proper containment of their contents under the environmental conditions in which they are stored; and
- (b) kept sealed or covered when not in use and arranged so that they cannot be dislodged, fall or suffer any other damage.

- (3) Waste materials that could be detrimental to a person's health or could cause a fire or explosion, shall be
- (a) stored in impervious containers labelled to clearly identify the contents and the nature of the hazard and where the contents are flammable or capable of producing vapours or gases, the containers shall be covered and located in well-ventilated areas; and
  - (b) collected, handled, stored and disposed of by persons trained to safely handle the waste material and wearing any necessary protective clothing and equipment to safeguard their own and any other person's health and safety.

#### Dust Control

- 9.09.** In a building where dust or other material could, by becoming airborne, result in a hazard by restricting vision causing a fire or explosion, or if the material could be potentially hazardous if inhaled or ingested, the material
- (a) shall be removed without delay by suitable means such as vacuuming, wet sweeping or wet shovelling; or
  - (b) shall be suppressed, if it is not practicable to remove the material.

#### Spills

- 9.10.** Spills or releases of any hazardous materials shall be cleaned up as soon as possible by persons trained to safely handle the hazardous material and wearing any necessary protective clothing and equipment to safeguard their health and safety.

#### Flammable Waste Storage

- 9.11.** Waste materials containing solvents, grease, paints or other flammable substances shall be stored in covered metal containers while awaiting disposal.

### HYGIENE

#### Facilities

- 9.12.** The manager shall provide and maintain hygienic facilities appropriate to the hazardous substance present in the worksite, including clean hot and cold water, soap and individual towels and, where necessary, shall provide on-site facilities to launder contaminated clothing.

#### Practices

- 9.13.** (1) The manager, in consultation with the Committee, shall establish a procedure respecting such hygiene practices as are necessary to protect an employee from exposure to the hazardous substances present in the workplace.

(2) The manager shall ensure that an employee who may be exposed to a hazardous substance and his or her supervisor receive information and instruction on the hygiene practices necessary to protect the employee from such exposure.

(3) The manager shall post copies of the hygiene practices established pursuant to subsection (1) at or near the locations where the hygiene practices are to be observed.

(4) An employee shall work in compliance with the hygiene practices established under subsection (1).

(5) The manager shall allow an employee who works with hazardous substances to take the time required to adequately carry out the necessary hygiene practices.

## Antidotes

**9.14.** (1) At a mine where poisonous or dangerous compounds, solutions or gases exist, the manager shall ensure that a sufficient supply of satisfactory antidotes and washes for treating injurious exposure to compounds, solutions or gases is kept in a conspicuous place as near the compounds, solutions or gases as is practicable.

(2) The manager shall ensure that persons are trained in the use of the antidotes and washes supplied under subsection (1).

## ABRASIVE BLASTING

### Silica or Lead

**9.15.** (1) No person shall use abrasive blasting material containing 1% or more free silica or lead.

(2) Subject to subsection (3), where abrasive blasting and similar operations are conducted within a building, the operations shall be conducted in an isolated enclosure to prevent injury to persons, and the enclosure shall have sufficient exhaust ventilation to ensure that a continuous inward flow of air is maintained at all openings in the enclosure during the blasting operation.

(3) Where it is not possible to provide an isolated enclosure, all persons other than those carrying out the work shall be removed from the area.

(4) Abrasive blasting and similar operations conducted outside a building shall be conducted in a place and in a manner that prevents injury to persons.

### Protective Equipment

**9.16.** (1) Where an abrasive blasting operation is being conducted, the manager shall supply and employees shall wear air-supplied hoods or respirators suitable for the work, together with gloves, leggings and clothing designed to protect the employees from dust and projected abrasive or other material

(2) Air supplied to the hood or respirator shall meet the requirements of the standard CAN3-Z180.1-M85, Compressed Breathing Air and Systems, and the volume of air supplied shall be sufficient for respiration and to prevent the entry of contaminants into the hood or respirator and shall not be less than 105 l per minute of air to tight fitting face-pieces and 170 l per minute of air to loose-fitting helmets, hoods and suits.

### Nozzles and Valves

**9.17.** (1) Blast cleaning nozzles shall be equipped with an operating valve that must be held open manually and the normal operation of this valve shall not be defeated.

(2) A support shall be provided on which the nozzle referred to in subsection (1) can be secured when not in use.

(3) In addition to the operating valve required by subsection (1), another operating control shall be readily accessible to the operator to enable the flow of abrasive material to be stopped immediately.

### Workers to be Removed

**9.18.** (1) Where an abrasive blasting or a similar operation releases harmful substances into the atmosphere, persons who are not required to assist in the operation shall be removed from contaminated areas.

(2) Where removal of persons as required by subsection (1) is not practical, the exposed persons shall be advised of the hazard and supplied with suitable personal protective equipment and the exposed persons shall wear the equipment.

## NOISE

### Exposure Levels

**9.19.** The manager shall take all reasonable measures to ensure the noise levels at worksites in a mine do not exceed the exposure levels shown in Schedule 5 (Noise Exposure).

### Measurements of Noise Levels

**9.20.** (1) The manager shall ensure that a noise level survey is conducted at all worksites.

(2) The results of every noise level survey shall be given to the Committee and made available to an inspector.

(3) Where the noise is constant and measurements show noise levels in excess of 85 dBA, the area shall be clearly marked by signs indicating the range of noise levels measured.

(4) In any area where the noise level may exceed 85 dBA, the manager shall ensure that effective procedures are provided to protect employees from any harmful effects of the noise and copies of the procedures are sent to the chief inspector and given to the Committee.

(5) Where personal noise dosimeters are used they shall have the following measurement specifications:

- (a) a noise measurement exchange rate of 3dB;
- (b) a threshold level of 75 dBA or lower; and
- (c) if measurement is expressed as a percentage, a reading of 100% for an average exposure of noise equivalent to 85 dBA for eight hours (Lex).

### Abatement of Noise Levels

**9.21.** Where the chief inspector has reason to believe that the manager has not taken means to reduce noise levels that frequently exceed 85 dBA, the chief inspector may require the manager, within a specified period of time, to obtain an independent professional opinion with respect to means of abating the noise.

### Hearing Protection

**9.22.** (1) Subject to subsection (2), the selection of the type of hearing protection devices provided by the owner is a matter to be jointly decided by the manager and the Committee or, where there is no Committee in place, other representatives of the employees.

(2) Hearing protective devices shall be used in accordance with the recommendations of Table A1 (Selection of Hearing Protectors) in the standard CAN/CSA Z.94.2-94, Hearing Protectors.

**9.23.** Where an inspector has reason to believe that the type of hearing protective device provided by the manager is unsuitable for use by the employee, the inspector may require the manager to provide an alternative type.



**9.24.** Every manager shall ensure that any mould of the auditory canal taken for manufacture of a hearing protective device shall be moulded for the employee by a qualified person and the initial fitting of the employee shall be done by a qualified person.

**9.25.** The manager shall develop and implement a hearing conservation program that shall include:

- (a) education of the employees;
- (b) noise surveys of worksites and equipment;
- (c) engineering and administrative controls;
- (d) hearing protection for employees;
- (e) audiometric testing; and
- (f) consultation with employees.

#### Audiometric Testing

**9.26.** (1) Every employee who works in an environment where the noise level is 80 dBA or greater shall, at the expense of the owner, be given an audiometric test for hearing acuity by a person who, in the opinion of the chief inspector, is qualified to conduct such tests

- (a) on commencing employment;
- (b) annually on the anniversary of commencing employment; and
- (c) at any other time when required by the manager or the chief inspector.

(2) The manager shall keep on file a record of the audiometric tests and the record shall be available for examination by an inspector.

(3) The manager shall give the results of an audiometric test of an employee to the employee within three days of receiving the results.

#### NON-INHALATION EXPOSURE

##### Injury to Eyes

- 9.27.** (1) Where there is potential for injury by eye contact, a manager shall
- (a) provide exposed workers with such personal protective equipment as may be appropriate to their actual or potential exposure, including safety glasses, goggles or face shields or other eye protective equipment that complies with CSA Standard CAN/CSA Z94.3-M88, Industrial Eye and Face Protectors; and
  - (b) provide, at or near the exposure site, the appropriate hygiene facilities including portable eye wash stations or eye wash fountains and maintained in a hygienic and working condition.

(2) No person shall wear contact lenses while working at a mine except in areas that the manager has designated, in writing, as an area where contact lenses may be worn.

##### Injury by Skin Contact

- 9.28.** (1) Where there is potential for injury by skin contact with toxic substances or by absorption through the skin, a manager shall
- (a) provide employees with the appropriate personal protective equipment including impervious gloves, aprons, boots, face shields and employer-laundered coveralls; and
  - (b) provide employees with the appropriate hygiene facilities including wash basins, showers, change rooms, quick-acting deluge showers and first aid supplies for burns, allergies and rashes.

(2) Where serious harm may result from brief skin contact, hygiene facilities shall be provided at or near the exposure site.

(3) Where harm of any kind results from prolonged skin contact, the hygiene practices set out in the procedure established under section 9.13 shall be followed by every employee so exposed.

#### Injury by Ingestion

- 9.29.** Where there is potential for injury by ingestion, the manager shall
- (a) provide employees with the appropriate personal protective equipment as a measure against inadvertent ingestion;
  - (b) provide the appropriate hygiene facilities including separate lockers for work and street clothes, a separate laundry for work clothes, change rooms, showers, uncontaminated eating areas and washbasins as a measure against inadvertent ingestion; and
  - (c) prohibit workers from eating, chewing, drinking, smoking or applying cosmetics in areas within the workplace potentially contaminated with hazardous substances that are harmful by ingestion.

#### Training

**9.30.** Every manager shall provide training to employees in the proper use and care of the personal protective equipment and hygiene facilities required by these regulations.

#### Responsibility for Wearing and Maintenance of Protective Equipment

**9.31.** Every employee shall use the personal protective equipment and hygiene facilities provided in accordance with these regulations and observe the proper procedure for their use and care.

### INHALATION EXPOSURES

#### Engineering Controls

**9.32.** (1) A manager shall cause to be investigated the need for engineering controls where the airborne concentration of a contaminant exceeds the TLV-TWA or 50% of the TLV-C of the occupational exposure limit as listed in the 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices published by the American Conference of Governmental Industrial Hygienists, or as set out in these regulations.

(2) For purposes of sections 9.32 to 9.34, exposure levels and compliance with occupational exposure limits shall be determined by an air sampling procedure that is acceptable to the chief inspector.

(3) A manager shall ensure that at least one air sampling survey is conducted to verify the adequacy of engineering controls where such controls have been implemented or modified.

**9.33.** (1) The manager shall ensure that engineering controls, required under section 9.32 are maintained in proper working order.

(2) The monitoring and maintenance of the engineering controls shall be in accordance with a procedure established by the manager in consultation with the Committee.

(3) The monitoring and maintenance procedures referred to in subsection (2) shall describe the engineering controls and shall include

- (a) the practices and procedures for the monitoring and maintenance of the engineering controls;

- (b) schedules for the monitoring and maintenance of the engineering controls;
- (c) pre-placement and periodic training of employees in the monitoring and maintenance program; and
- (d) the recording of the actions taken in a log-book.

#### Remedial Action

**9.34.** Where the results of the air sampling conducted pursuant to subsection 9.32(3) or the monitoring conducted pursuant to subsections 9.33(2) and (3) indicate that the engineering controls are not adequate, the manager shall implement all reasonable measures and procedures necessary in the circumstances to bring the airborne concentration of a contaminant to below its occupational exposure limit as listed in the 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices published by the American Conference of Governmental Industrial Hygienists, or as set out in these regulations.

**9.35.** Where an employee is exposed to a hazard, the manager shall provide information to the employee on the health consequences of exposure and the importance of work practices and engineering controls in limiting exposure.

#### RESPIRATORS

**9.36.** A manager shall provide respiratory protective devices that comply with CSA Standard Z94.4-93, Selection, Use and Care of Respirators.

**9.37.** (1) A manager shall ensure the use of respirators in place of engineering controls where the manager determines, in consultation with the Committee, that

- (a) engineering controls are not feasible because an emergency exists or because maintenance requiring a temporary shutdown is being conducted;
- (b) engineering controls are not reasonable and practicable because of the nature of the maintenance work being conducted; or
- (c) engineering controls are not reasonable and practicable because the work is undertaken on an infrequent and irregular basis.

(2) The manager shall inform the chief inspector of the reason for every determination made under subsection (1).

**9.38.** The chief inspector may permit the use of respirators as an interim measure for a period not exceeding 90 days or for such other period as the chief inspector considers necessary, pending the introduction or improvement of the required engineering controls.

**9.39.** (1) The respirators required under sections 9.36 to 9.38 shall be appropriate to the concentration of the hazardous substance to which the employee may be exposed and shall comply with the specifications issued by the manufacturer for their use.

(2) A manager shall ensure that the respirators provided are in a condition that will not endanger the health or safety of the employee using them.

(3) All respirators shall be of types approved by the chief inspector.

**9.40.** The manager shall appoint a qualified person

- (a) to examine respirators and carry out the tests or procedures necessary to ensure that they serve their intended purpose in the workplace; and
- (b) to ensure that the respirators fit the individual employees correctly.

**9.41.** The manager shall

- (a) establish procedures for the proper care, use, maintenance and storage of respirators as recommended by the manufacturer;

- (b) ensure that the procedures established under paragraph (a) are followed;
- (c) prepare a schedule for the maintenance of respirators as recommended by the manufacturer; and
- (d) ensure that the maintenance schedule established under paragraph (c) is followed.

**9.42.** A manager shall provide suitable storage facilities for respirators.

## ILLUMINATION

### Lighting Standards

**9.43.** Subject to section 9.44 and unless otherwise specified in these regulations, the manager shall ensure that at all working places on the surface of a mine, suitable and adequate illumination is provided that meets the standards set out in the ANSI/IES Standard RP-7-1979, American National Standard Practice for Industrial Lighting.

### Underground Lighting Standards

**9.44. (1) The manager shall provide suitable permanent lighting at the following locations and at any other location required by the chief inspector:**

- (a) ore pass and waste pass dumps;**
- (b) loading pockets;**
- (c) shaft stations and conveyance landings;**
- (d) garages and fuel bay areas;**
- (e) electrical switchrooms;**
- (f) underground hoistrooms;**
- (g) first aid stations;**
- (h) battery charging stations;**
- (i) lunchrooms;**
- (j) refuge stations;**
- (k) service bays;**
- (l) conveyor walkways;**
- (m) walkways and platforms in both crusher and backfill stations;**
- (n) pump stations.**

**9.45. The manager shall ensure that all doors through which vehicles and pedestrians pass or which cover ore pass and waste pass dumps shall be clearly distinguishable from the surroundings.**

**9.46.** Where permanent lighting is provided, the lights shall be installed in such a way as to minimize glare.

**9.47.** Portable lamps used in an underground mine shall be of a type approved by the chief inspector.

**9.48.** The manager shall ensure that all mobile equipment lights conform to the standards for vehicle lighting set out in standard CSA-M424.2-M90, Non-Rail-Bound Diesel-Powered Machines for use in Non-Gassy Underground Mines.

**9.49 The manager shall ensure that all trackless haulage equipment used underground is permanently fitted with tail lights and with at least two headlights to illuminate the roadway.**

**9.50.** The manager shall ensure that drill jumbos, slushers and rockbolters are provided with flood lamps when the viewing distance to the work surface is greater than 3 m from the operator.

**9.51.** When working underground or in an active mining area on the surface between the hours of sunset and sunrise, every person shall wear reflective tape on the back and sides of protective headgear and clothing.

**9.52.** The manager shall provide every person entering an underground mine with a cap lamp of a type acceptable to the chief inspector and the person shall keep the lamp in his or her possession while underground.

**9.53.** The cap lamps required by section 9.52 shall be capable of providing a peak illuminance of at least 1500 lux at 1.2 m from the light source, for the duration of the shift.

**9.54.** (1) The manager of an underground mine shall develop a procedure for the testing and maintenance of

- (a) cap lamps;
- (b) portable lamps; and
- (c) auxiliary lighting required by section 9.55.

(2) A copy of the procedure for the maintenance and testing of cap lamps and portable lamps and the results of the tests of such lamps shall be made available to an inspector at his or her request.

**9.55.** Where a person who normally uses a cap lamp for illumination has to assess ground conditions in an underground mine at a distance greater than 3 m, the manager shall supply and the person shall use auxiliary lighting that is adequate for safely carrying out the assessment.

**9.56.** (1) The manager shall ensure that there is a separate and independent emergency source of illumination at all places on the surface where a hazard could be caused by a failure of the normal lighting system.

(2) The emergency lighting system referred to in subsection (1) shall

- (a) turn on automatically when the normal lighting fails;
- (b) provide illumination of at least 50 lux to allow employees to initiate emergency shutdown procedures and to leave their work areas safely; and
- (c) be tested as frequently as necessary to ensure that it will function when required.

## THERMAL ENVIRONMENT

**9.57.** (1) Where it is not reasonably practicable to control thermal conditions and the thermal conditions, together with the nature of the work, can cause distress or illness to a person, the manager shall institute a program to

- (a) inform employees to the possible adverse effects of their working environment;
- (b) train employees how to recognize symptoms of heat or cold stress and what emergency treatment should be applied; and
- (c) monitor thermal conditions to identify when employees could be adversely affected by heat or cold stress and if protective measures are required to adequately protect employees.

(2) The Committee shall be advised of the measures taken and may review and comment on them.

**9.58.** (1) Where work is performed continuously at or below  $-30^{\circ}$  C or at an equivalent chill temperature, readily accessible heated warming shelters shall be provided for use by employees affected.

(2) The shelters shall be kept clean, provided with a suitable means of heat that shall be available for use at all times and a means of communication.

**9.59.** Where it may not be practicable to conform to the requirement of section 9.58, the manager of a mine where persons work in temperatures at or below  $-30^{\circ}$  C or at an equivalent chill temperature shall submit a procedure for the protection of persons exposed to these temperatures to the Committee and send a copy to the chief inspector.

**9.60.** Where acclimatized employees may be exposed to heat stress, the permissible heat exposure limits are those shown in the 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices published by the American Conference of Governmental Industrial Hygienists.

**9.61.** Where special clothing is required for particular work, the manager shall ensure that due allowance is made for the insulation value of the clothing and the time limits are modified accordingly to meet the limits set out in the 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices published by the American Conference of Governmental Industrial Hygienists.

**9.62.** When persons are exposed to conditions of heat stress shown in the 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices published by the American Conference of Governmental Industrial Hygienists, potable water to drink shall be made available, kept cool and kept at or near the worksite.

#### LUNCHROOMS AND SANITARY CONVENIENCES

##### Drinking Water

**9.63.** The manager shall provide a source of potable drinking water complying with the drinking water standards of the Department of Health and Social Services in locations that

- (a) are reasonably accessible to employees;
- (b) are kept clean and in a sanitary condition; and
- (c) are designed to permit the water to be dispensed and drunk in a sanitary manner.

##### Use of Solder

**9.64.** After these regulations come into force, installations of pipes and vessels and changes to existing pipes and vessels that carry water to be used by persons for drinking purposes shall not be constructed using solder containing more than 1% lead.

##### Lunchrooms

**9.65.** (1) Where five or more persons regularly congregate to eat food, other than in a place where the mining activity of an open pit mine is performed, a lunchroom shall be provided and the lunchroom shall

- (a) be heated, lighted and ventilated;
- (b) have or be located near,
  - (i) for persons working on the surface, facilities to wash with cold and hot water and to dry their hands, and
  - (ii) for persons working underground, facilities to wash and dry their hands;
- (c) not have an entrance through a toilet facility;
- (d) contain sufficient fire retardant receptacles with lids to accommodate all waste food, paper and other related material;
- (e) have suitable seating facilities and tables with impervious top surfaces which shall be kept in clean and sanitary condition;

- (f) be constructed of materials which can be maintained in a clean and sanitary condition;
- (g) have the minimum dimensions set out in subsection (2); and
- (h) be located in an area away from process chemicals and contaminants.

(2) The minimum dimensions of a lunchroom referred to in subsection (1) shall, subject to subsection (3), be established by reference to the number of persons who use it on a regular basis in accordance with the following table:

No. of Persons	Sq. m/Person
25 or less	1.2
26 to 74	1
75 to 149	0.66
150 to 499	0.56
500 or more	0.46

(3) No lunchroom referred to in subsection (1) shall have a minimum size of less than 6 square m.

(4) Employees shall use the receptacles provided pursuant to paragraph (1)(d) to dispose of all waste food, papers and other related material.

(5) The manager shall ensure that the receptacles provided pursuant to paragraph (1)(d) are emptied daily.

#### Mine Dry

**9.66.** (1) The manager shall provide separate facilities for male and female employees to wash and shower and to change and dry their clothing and each facility shall include separate storage facilities for street clothes and working clothes.

(2) The facilities provided pursuant to subsection (1) shall have separate approaches with signs clearly indicating for which sex they have been provided.

**9.67.** (1) A mine dry shall not be located

- (a) in a headframe, boiler room, engine room, bunkhouse or dining room unless a separate, properly constructed room is provided; or
- (b) nearer than 15 m to a shaft house or portal house unless it is constructed of non-combustible materials.

(2) The mine dry shall be adequately heated, lighted and ventilated, kept clean and sanitary and have one shower for every four persons leaving work at the same time.

#### Temperature of Washing Water

**9.68.** Water that is to be used for personal washing shall not exceed 60 °C at any outlet, shall not be mixed directly with steam and there shall be sufficient capacity for all persons on shift.

#### Toilet Facilities

**9.69.** (1) The manager shall provide conveniently located and separate toilet facilities on the surface for male and female employees.

(2) The toilet facilities shall have separate entrances, with signs clearly indicating for which sex they have been provided, and shall be equipped with

- (a) one toilet and one urinal for every 20 male employees or additional fraction thereof on shift, and one toilet for every nine female employees or additional

- fraction thereof on shift, except where the maximum number of employees on any shift is fewer than six, in which case only one toilet is required;
  - (b) one wash basin, or equivalent facility, provided with hot and cold running water for every 15 employees or additional fraction thereof;
  - (c) a means for drying hands hygienically; and
  - (d) adequate heat, light and ventilation.
- (3) For the purposes of subsections (1) and (2), each .6 m of a straight trough urinal may be counted as one urinal and each 500 mm in circumference of a circular wash fountain or length of a straight trough wash basin may be counted as one wash basin.
- (4) A fixed toilet at the surface of a mine shall be
- (a) of the water flushing type or other sanitary design located in an individual compartment with a door that locks and with walls and floor of a finish or material that can be easily cleaned;
  - (b) fitted with an open-front seat, if the seat is installed after these regulations come into force;
  - (c) provided with a reasonable supply of toilet paper;
  - (d) provided with a clothes hook and lighting where electricity is available; and
  - (e) kept clean and sanitary and any waste products shall be disposed of regularly.
- (5) Toilets in an underground mine and portable toilets on surface shall
- (a) be conveniently located in well ventilated areas having regard to the number of employees in the various parts of the mine;
  - (b) provide privacy;
  - (c) be supplied with toilet paper;
  - (d) be maintained in a hygienic condition and have all waste material removed regularly; and
  - (e) be equipped with facilities for persons to clean their hands or such facilities shall be located nearby.
- (6) No person shall deposit faeces in any place in an underground mine other than a toilet.

## ERGONOMIC FACILITIES

**9.70.** The manager shall provide effective protection for any worker who may be at risk of injury from work that

- (a) takes place in a manner that imposes limitations on motion or action;
- (b) is of a repetitive manner;
- (c) requires constant and uninterrupted mental concentration; or
- (d) requires excessive or awkward physical effort.

**9.71.** The protection required by section 9.70 may include

- (a) the provision of equipment or tools designed, constructed, positioned and maintained to reduce the harmful effects of the work;
- (b) appropriate operating procedures to reduce the harmful effects of the work;
- (c) limited work schedules with rest and recovery periods, changes in workloads or other arrangements for alternating work to reduce the harmful effects of the work; and
- (d) any other appropriate measures.

**9.72.** (1) The manager shall ensure that suitable mechanical equipment is provided and used for the handling of heavy or awkward loads.

(2) Where the use of mechanical equipment is not practicable, the manager shall take all practical means to adapt heavy or awkward loads to facilitate lifting, holding or transporting by employees or to otherwise minimize the manual handling required.



**9.73.** An employee may refuse to engage in the manual lifting, holding or transporting of any load which by reason of its weight, size or shape, or by any combination of these, or by reason of frequency, speed or manner in which it is undertaken, may be injurious to the employee's health or safety.

**9.74.** Every manager shall ensure that an employee who is to engage in the lifting, holding or carrying of loads receives appropriate training in safe methods of lifting, holding or carrying loads.

#### Vibration Syndrome

**9.75.** (1) The manager shall establish procedures to reduce the exposure of employees to hand-arm vibration.

(2) The procedures established under subsection (1) shall include one or more of the following:

- (a) the fitting of anti-vibration devices to the handles of stoppers and jackleg drilling machines;
- (b) the provision of anti-vibration insulated gloves fitted so as to keep an operator's hands as warm and dry as possible;
- (c) minimizing the time of exposure to vibration in the working shift; and
- (d) training and instruction of vibrating type machine operators and their supervisors to adopt proper methods of machine handling and the consequences of incorrect machine handling.

#### RADIATION HAZARD

##### Definitions

**9.76.** In this section and in sections 9.77 to 9.96,

"ionizing radiation" means any atomic or sub-atomic particle or electro-magnetic wave having sufficient energy to produce ionization;

"National Dose Registry" means the National Dose Registry maintained by the Occupational Radiation Hazards Division of the Department of Health and Welfare Canada;

"permissible dose" means the

- (a) maximum permissible dose of ionizing radiation as determined in accordance with Schedule 6 (Maximum Permissible Doses of Ionizing Radiation), or
- (b) maximum permissible exposure to radon daughters as determined in accordance with Schedule 7 (Maximum Permissible Exposures to Radon Daughters);

"Radiation Exposure Control Code of Practice" means a procedure to ensure that the concentration of radon daughters in a mine is kept as low as reasonably achievable;

"radon daughters" means the short-lived radioactive decay products of radon-222 and includes thoron daughters;

"rem" means a dose of ionizing radiation equal to 0.01 of a Sievert;

"Sievert" means a unit of measurement equal to 1 J/kg;

"working level" or "WL" means a concentration of any combination of radon daughters in one litre of air that will release  $1.3 \times 10^5$  mega-electron volts of alpha particle energy during their radioactive decay to lead-210;

"working level month" or "WLM" means the exposure resulting from inhalation of air containing one working level of radon daughters for 170 hours.

**9.77.** All radioactive materials shall be used, handled, stored, transported and disposed of in accordance with the Atomic Energy Control Regulations (Canada).

**9.78.** Where laser emitting devices are used, they shall be classified and used in accordance with the procedures outlined in the standard ANSI Z136.1-1980, American National Standard for the Safe Use of Lasers, published by the American National Standard Institute.

**9.79.** Warning signs shall be posted and properly constructed screens or enclosures used wherever there could be a danger to any person from an inadvertent exposure to a laser beam.

**9.80.** The manager shall

- (a) ensure that equipment which emits levels of infrared or ultraviolet radiation in excess of limits permitted under Schedule 6 (Maximum Permissible Doses of Ionizing Radiation) and Schedule 7 (Maximum Permissible Exposures to Radon Daughters) is shielded to protect employees from exposure to such radiation;
- (b) supply personal protective equipment to any person who could become exposed to harmful radiation levels and the person shall wear the protective equipment; and
- (c) ensure that employees are protected according to the recommendations in the handbook Threshold Limit Values for Chemical Substances and Physical Agents issued by the American Conference of Governmental Industrial Hygienists.

**9.81.** The manager shall ensure that persons at the mine are not exposed to non-ionizing radiation which exceeds the recommendations contained in the publication Safety Code 6, Recommended Safety Procedures for the Installation and Use of Radio Frequency and Microwave Devices in the Frequency Range of 10 MHz to 300 GHz, published by the Department of Health and Welfare, Canada.

#### Test of Concentration of Radon

**9.82.** Sections 9.83 to 9.96 apply to a mine where levels of radiation are greater than the levels permitted in respect of office workers and persons other than surface or underground workers under Schedule 6 (Maximum Permissible Doses of Ionizing Radiation) and Schedule 7 (Maximum Permissible Exposures to Radon Daughters).

**9.83.** (1) The chief inspector may order the manager to perform a hazard analysis to determine if a radon hazard exists.

(2) Where the chief inspector determines as a result of a hazard assessment that radon exists in a mine, the manager shall ensure that the mine is monitored by the taking of air samples or other tests to determine the exposure to ionizing radiation and radon daughters that may occur to workers or other persons working in or passing through that area.

(3) Subject to subsection (4), the location, frequency and manner of the monitoring shall be determined by the manager and approved by an inspector.

(4) The interval between the taking of any two consecutive air samples to determine exposures at any location shall not exceed one month.

**9.84.** The manager shall appoint a radiation officer to be responsible for giving instruction to employees on radiation safety.

**9.85.** (1) The manager shall prepare a radiation exposure control code of practice to include engineering controls and industrial hygiene practices and submit it to the chief inspector for approval.

(2) The manager shall implement a radiation exposure control code of practice that has been approved by the chief inspector.

(3) The manager and other persons at the mine shall comply with the radiation control code of practice.

**9.86.** The manager shall ensure that no person receives more than a permissible dose.

**9.87.** (1) The manager shall ensure that records are kept showing the dose of ionizing radiation and exposure to radon daughters received by each person.

(2) The records required in subsection (1) shall include a record of the number of hours that each person spent in each area of the mine and a measurement of the levels of ionizing radiation and radon daughters in each area.

**9.88.** The manager shall submit to the National Dose Registry a return every month in accordance with National Energy Board procedures, with a copy to the chief inspector showing

- (a) the monthly, quarterly, annual and cumulative doses of ionizing radiation and exposures to radon daughters received by any person; and
- (b) the monthly average levels of ionizing radiation and radon daughters in the areas monitored under section 9.83.

**9.89.** (1) All records required to be kept under sections 9.83 to 9.96 shall be kept available for inspection by an inspector at all times.

(2) The personal records of any person kept under sections 9.83 to 9.96 shall be kept available for inspection by the employee at all times.

**9.90.** The manager shall inform any person in writing of the amount of the exposure of the employee to radon daughters when that exposure reaches

- (a) 0.75 WLM in any one month;
- (b) 1.5 WLM in any period of three consecutive months; or
- (c) 2 WLM in any period of 12 consecutive months.

**9.91.** (1) A person shall only use procedures and instruments approved by the chief inspector to measure doses of ionizing radiation and exposures to radon daughters.

(2) A person shall only use instruments calibrated to the satisfaction of an inspector at least once every six months to measure doses of ionizing radiation and exposures to radon daughters.

**9.92.** The manager shall ensure that the airborne concentrations of ionizing radiation and radon daughters at each working area of a mine are kept as low as reasonably achievable.

**9.93.** (1) An inspector may order radiological measurements to be taken and recorded in any area of a mine at any time.

(2) The manager shall, in respect of each working area of a mine, walkway and any other area designated by an inspector, ensure that dated reports of its radiological measurement are signed by the manager and posted in a conspicuous location in the area.

**9.94.** (1) The manager shall, before employing a person, obtain that person's record of any previous accumulated dose of ionizing radiation and exposure to radon daughters.

(2) The manager shall, before permitting a contractor or any person employed by a contractor to work at a mine, obtain the record of any previous accumulated dose of ionizing radiation and exposure to radon daughters of the contractor or other person.

(3) Where the manager cannot obtain the record specified in subsection (1) or (2) directly from the person, the manager shall obtain the record from the National Dose Registry with the written consent of the person.

**9.95.** (1) Where the record of exposure of a person to ionizing radiation or radon daughters indicates that at the current rate of exposure he or she will receive more than a permissible dose, the manager shall reassign the person to work in an area where the rate of exposure will be reduced to a rate that will prevent the person from receiving more than a permissible dose.

(2) Where an employee is reassigned pursuant to subsection (1), the employee's wages shall not be reduced.

**9.96.** Before a person commences work at a mine, the manager shall ensure that the person is informed of

- (a) the health hazards associated with his or her duties, in particular the health effects of radiation exposure and the added risk to an employee from smoking;
- (b) the radiation exposure control code of practice; and
- (c) any special methods, procedures and techniques to be followed as a result of the presence of radiation.

## PART X

### MECHANICAL EQUIPMENT

#### Equipment at Mines

**10.01.** (1) All mechanical equipment used at mines shall be

- (a) designed in accordance with good engineering practice; and
- (b) constructed in accordance with a design and plans that have been certified by a professional engineer.

(2) Except where otherwise required or permitted by these regulations, the design of mechanical equipment and systems used at mines shall comply with the most recent applicable Canadian national standard developed for that equipment or system.

**10.02.** Where no Canadian national standard exists or where the equipment or system has been designed to a different standard, the chief inspector may vary the requirements of subsection 10.01(2).

**10.03.** The chief inspector may require that a mechanical system or piping system comply with section 10.01.

**10.04.** (1) The manager shall ensure that a procedure is established for the safe operation, maintenance, inspection and testing of mechanical equipment and **any system considered to be hazardous by the Committee.**

(2) The manager shall send a copy of the procedure referred to in subsection (1) to the Committee and the Committee may advise and comment on it.

(3) The procedure referred to in subsection (1) shall be based on the manufacturer's recommendations and shall

- (a) specify the safety inspection and testing to be performed before the equipment or system is first used by any person on a shift to confirm the proper operation of

the service brakes, emergency brakes, parking brakes, retardation system, steering systems, lights, fire extinguishers, tire pressures, accumulator pressures, fluid levels, communication systems, fall arrest systems and other safety devices and systems;

- (b) schedule the equipment or system for routine inspection and maintenance;
- (c) itemize the tests to be conducted before the equipment or system is first used or following maintenance work on the equipment or system;
- (d) ensure that a written record of each test, inspection and maintenance work carried out on each unit of equipment or system is entered into a maintenance record specific to each unit of equipment or system and as required in the equipment's or system's log-book; and
- (e) provide for the testing, inspection and maintenance work to be performed by qualified persons.

**10.05.** The manager shall ensure that the procedure referred to in section 10.04 requires that

- (a) the equipment or system be locked out or tagged after a person has discovered a defect, fault, malfunction, or any other condition that could affect the safe operation of the equipment or system; and
- (b) the equipment or system not be used until it is safe to operate.

**10.06.** The manager shall ensure that a procedure is established for the operator of a mobile equipment unit to shut off the engine where the equipment is unattended, is stationary for other than a short period of time, or is being refuelled.

**10.07.** The manager shall ensure that all the procedures applicable to the equipment or system are included in the training program referred to in section 10.13 for the equipment or system and are made available to and are understood by the employee before the employee is authorized to operate or service the equipment or system.

**10.08.** The manager shall ensure that every procedure is fully complied with by all persons.

#### Log-Books

**10.09.** (1) The manager shall ensure that, in addition to the maintenance records, a clear and reproducible log-book is provided and maintained in respect of each elevator, raise climber, crane and hoisting plant.

(2) The following shall be recorded in the log-book:

- (a) the name of a person who reports a defect and the time and date the defect is reported;
- (b) a record of the time and date on which testing, servicing or inspection is performed;
- (c) a record of the findings of any tests and examinations;
- (d) a record of any repairs and modifications performed and the signature of the person performing such work;
- (e) the signature of the supervisor authorizing the repairs or modification referred to in paragraph (d);
- (f) any other information the person recording it considers advisable.

**10.10.** (1) Where an equipment log-book is used, the operator shall, prior to operating any unit of equipment or any system, read and initial the entries made in the log-book by the previous operator and if an unsafe condition has been recorded but not corrected or if during the pre-operational checkout required by section 10.04 or during the shift an unsafe condition is discovered, the operator shall note the unsafe condition in the log-book and shall not operate the equipment or system until repairs have been made by an authorized person and the repairs have been noted in the log-book.

(2) Where the authorized person referred to in subsection (1) assures the operator of the equipment or system that it is safe to operate the equipment or system and notes the reason why it is safe to do so in the log-book, the operator may operate the equipment or system.

(3) If no unsafe condition exists at the start of the shift, the operator shall record that fact at the start of the shift in the log-book and, if no problems are experienced during the shift, the operator shall record that fact at the end of the shift in the log-book.

**10.11.** The manager shall ensure that at least once each month a qualified person

- (a) reviews the entries made for the previous month in the log-book and maintenance record;
- (b) ensures that all examinations and tests required by these regulations have been conducted;
- (c) ensures that any repairs and adjustments that were required were made; and
- (d) upon completion of the review, certifies by signing in the log-book and the maintenance record that he or she has complied with this section.

**10.12.** The procedures, maintenance records and log-books required to be kept by the regulations shall be available for inspection by an inspector.

#### Training

**10.13.** No person shall operate or service any equipment or system unless he or she has received the minimum training required for that particular equipment or system pursuant to the training program established by the manager under section 6.03 and is authorized to operate or service the equipment or system by his or her supervisor.

**10.14.** The minimum training program referred to in section 10.13 shall be based on the manufacturer's instructions and shall consist of

- (a) instruction time;
- (b) field time;
- (c) familiarization with the equipment or system to be used;
- (d) practising emergency procedures; and
- (e) a method of examination.

**10.15.** The manager shall ensure that the training and experience of a person in relation to equipment or a system is up to date before the person is authorized to operate or service the equipment or system.

#### Guards

**10.16.** Every

- (a) drive belt, chain, rope or cable,
- (b) pulley, sprocket, flywheel or geared wheel,
- (c) opening through which any belt, pulley or wheel operates,
- (d) bolt, key or set screw,
- (e) revolving, reciprocating or relative motion part,
- (f) item projecting from a surface, and
- (g) counter or tension weight unit and travel path,

and every other item that has motion or relative motion or is hot or electrically energized shall, unless it is so situated as to prevent a person from coming into accidental contact with it, be effectively enclosed, covered or guarded.

**10.17.** No person shall operate any equipment unless all guards are in place.

**10.18.** The manager shall ensure that suitable lighting, safe footing, and sufficient room is provided for all persons who are required to be near or about any operating equipment or system.

**10.19.** The manager shall ensure that, where it is required to service or cleanup on or about any equipment or system while it is operating,

- (a) the equipment or system shall be so constructed that the servicing or cleanup may be performed without removing any protective fence or guard;
- (b) only that part of the equipment or system that is vital to the process shall be energized;
- (c) only qualified persons shall be employed in those operations; and
- (d) the hand held tools and implements shall have no hand trapping arrangements.

**10.20.** Where it is necessary to remove a guard or fence from equipment,

- (a) the equipment shall be stopped and locked out; and
- (b) all guards or fences removed shall be replaced before the lock-out system is removed and the equipment is started.

#### Lock-Out Procedures

**10.21.** (1) The manager shall develop a lock-out procedure for **each mechanical or electrical equipment system**, and the procedure shall

- (a) include the requirements of subsections (2) to (6) and sections 10.22 and 10.23;
- (b) address the sources of all hazards that may be presented when a person is working on the equipment or system; and
- (c) specify, before the work starts, how the equipment or system is to be checked to verify that all hazards have been neutralized and that the equipment or system is safe to work on.

(2) The manager shall ensure that each person required to operate or work on any equipment or system is adequately trained in the lock-out procedure and that a written copy of the procedure is made available to each person.

(3) Before any work is performed on electrically powered equipment or on an electrically powered system, the main power source feeding the equipment or system shall be disconnected, locked out and tagged and, where necessary, the upstream and downstream equipment shall be disconnected, locked out and tagged.

(4) The locking device required by subsection (3) may be omitted where

- (a) the locking device in itself creates a hazard due to switch design; or
- (b) circuit breakers or fuses for voltage less than 150 volts to ground are not equipped with a means for locking.

(5) Where the equipment or system to be worked on is powered by a source other than electricity, the primary power supply to the power source shall be shut off, locked out and tagged and, where electricity is the primary power source to the power supply system, it shall be disconnected, locked out and tagged in accordance with subsection (3).

(6) Where the equipment or system to be worked on has pressurized fluids or moveable equipment members, the lock-out procedure shall note means of performing the following tasks before the work begins:

- (a) safely releasing or containing any stored-up energy;
- (b) blanking off or otherwise isolating a pipeline, where a valve in a pipe could leak and allow water, steam, compressed air or any other substance to reach the equipment or could otherwise allow an unintended action or inaction;
- (c) securing all loose or freely moveable members against unintended movement.

## Locks and Tags

**10.22.** (1) Locks and tags shall be issued to each person who works on machinery or equipment that has to be locked out.

(2) Tags issued to individual persons shall contain space for the recording of the person's name, the type of work being performed, the date and time the work was started and the name of the supervisor in charge.

(3) Where equipment is to be locked out, each person working on the equipment shall be responsible for affixing his or her own lock and tag to the lock-out device and for removing them on the completion of the work.

(4) The person who affixes the first lock in the lock-out procedure shall, before the work begins, confirm all hazards are neutralized by attempting to start the equipment and shall perform such other tests as are specified in the lock-out procedure to ensure that the equipment is properly locked out with all hazards neutralized.

(5) A lock and tag shall only be removed by the person who affixed it to the lock-out device or such other person as the manager may designate, if the person who affixed the lock and tag is not available.

(6) The designated person referred to in subsection (5) shall not remove a lock or tag until he or she has taken all reasonable steps to contact the person who affixed the lock or tag and is satisfied that no hazard exists.

(7) Notwithstanding subsection (3), where a large number of persons are involved in a work project, the manager shall develop a lock-out procedure, acceptable to the chief inspector, that modifies the requirements of this section.

(8) When equipment is locked out, an employee coming on shift shall place his or her own lock on the lock-out device before the employee going off shift has removed his or her lock.

(9) A supervisor may lock-out the equipment during a shift change to allow employees going off shift to remove their locks.

## Procedure Before Work Recommences

**10.23.** When work is completed on locked out or tagged equipment, and before any locks or tags are removed, all guards, fences and other safety devices shall be replaced.

## Annual Inventory

**10.24.** On or before March 31 in each year, the manager shall submit to the chief inspector a list of the type and size of the mechanical equipment, boilers, pressure vessels, and gas fired heating equipment in operation at the mine site.

## MOBILE EQUIPMENT

### Design

**10.25.** (1) Before a unit of mobile equipment is introduced at a mine, the manager shall ensure that the design of its electrical system, braking system, exhaust system, steering system, fire suppression system, roll over or fall on protection system and any other system design specified by the chief inspector is submitted to the chief inspector for review.



(2) The manager shall ensure that any modification affecting the systems identified in subsection (1) or any changes resulting in an increase to the weight carrying capacity of the mobile equipment are submitted to the chief inspector for review.

**10.26.** The manager shall ensure that the chief inspector is notified in writing prior to first placing into service any unit of mobile production equipment.

#### Back-up Alarm

10.27. (1) Every unit of mobile equipment and any other piece of equipment specified by the chief inspector, shall be equipped with an audible alarm device that sounds when the equipment is backing up and that conforms to the requirements of the Society of Automotive Engineers' Standards SAE J-1446, Machine Alarm Test and Evaluation Procedure for Construction and General Purpose Industrial Machinery and SAE J994, Alarm-Backup-Electric Laboratory Performance Testing.

(2) The alarm shall

- (a) be activated automatically and independently of the operator;
- (b) be clearly audible above the background noise at the workplace; and
- (c) continue as long as the equipment is moving in reverse.

(3) Subject to the approval of the chief inspector, mobile equipment designed for bi-directional use need not have an audible back-up alarm activated.

#### Transmission Interlock

**10.28.** Every unit of mobile equipment shall be equipped with an interlocking system to prevent the unit from being started unless it is unclutched or unless the transmission selector is in the neutral or park position.

#### Vehicle Requirements

**10.29.** (1) All rubber tired mobile equipment having a gross weight exceeding 7,000 kg and any other piece of equipment specified by the chief inspector, shall have a minimum of two wheel chocks that shall be used when the operator leaves the equipment in a stationary position.

(2) Subject to the approval of the chief inspector, the manager may develop an alternate procedure to using wheel chocks when the mobile equipment referred to in subsection (1) is left in a stationary position.

(3) All mobile equipment shall be equipped with

- (a) a firmly secured seat for the operator and any authorized passenger; and
- (b) suitable clearance lights, reflectors and direction of travel indicator lights.

(4) The seat referred to in subsection (3) shall be well maintained in a comfortable and shock absorbing condition that reduces the transfer of machine induced whole body vibrations to the operator.

(5) Mobile equipment equipped with an enclosed operator's cab shall have

- (a) windshields, side and rear windows;
- (b) rear vision mirrors, unless the unit is bi-directional;
- (c) glazing material that
  - (i) meets the requirements of ANSI Standard Z26.1, Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways or another standard approved by the chief inspector,
  - (ii) is kept in such condition as to provide clear visibility, and
  - (iii) is replaced if it obstructs the vision of the operator;

- (d) suitable defrosting and defogging devices; and
- (e) where applicable, windshield washers and wipers.

## Braking Systems

**10.30.** (1) All mobile equipment shall have

- (a) a service braking system;
- (b) a parking brake system; and
- (c) a secondary or emergency stopping system that may be provided by a system referred to in paragraph (a) or (b).

(2) Each braking system shall be so designed that it can be tested independently and can be readily applied by a person seated in the operator's seat.

(3) To fully apply and set the braking system, the braking system shall not require a force of more than

- (a) 700 N for a foot operated system;
- (b) 400 N for a hand operated system; or
- (c) 20 N for a finger operated system.

(4) The controls for the secondary brake system and parking brake system shall be arranged so that they cannot be released from the operator's seat after any application has been made unless immediate reapplication can be made from the operator's seat to stop the equipment.

(5) When required by the chief inspector, an independent means of retardation shall be provided in addition to the means set out in subsection (1).

(6) Braking systems using fluid shall

- (a) have an alarm device that will alert the operator when the available brake system pressure drops to, or below, its lowest safe operating pressure; and
- (b) be equipped with an emergency energy source capable of applying the braking system.

(7) No mobile equipment fitted with fluid activated service brakes shall be put into use for the first time unless

- (a) the system is split into two or more separate and independently operated circuits, each of which is capable of safely stopping and holding the equipment under any operating condition of load, grade, and speed; and
- (b) an alarm device is provided in the control panel of the equipment to warn the operator of a failure of a fluid circuit.

(8) The holding power of the parking brake shall be mechanically activated so that it is not affected by loss of fluid from the braking system.

(9) On all mobile equipment where components of the service brakes, secondary brake or parking brake systems are common, the components shall be arranged so that a failure in a common component shall not reduce the capability of one of the systems to stop the equipment safely within the limits of the secondary braking distance determined by the formula in paragraph 10.33(2)(e).

## **DIRECTIVES August 15, 1997**

**In order to comply with Regulations 10.31 to 10.36, the managers shall adopt the following procedures:**

- (1) The manager shall develop procedures, in accordance with manufacturer's specifications, for the testing of all braking systems for trackless mobile equipment for use in both underground and surface operation.**
- (2) The procedures shall be submitted to the Committee for review and to the Chief Inspector for approval.**
- (3) Pre-operation checks shall be conducted for each operating shift as specified in Regulation 10.04.(3).(a).**
- (4) All mobile equipment operators shall receive training in the brake system testing procedures, in accordance with Regulation 6.08.**

#### Tests of Brake System

**10.31.** No mobile equipment shall be put into service unless it has successfully completed the braking tests set out in sections 10.33 and 10.34.

**10.32.** (1) After the brakes of a unit of mobile equipment have been overhauled, the unit shall not be returned to service unless it has successfully completed the downgrade braking tests set out in section 10.33 and the parking brake system test set out in section 10.34.

(2) The manager shall ensure that no mobile equipment is operated more than 12 months after its most recent downgrade braking test until it has successfully completed a further downgrade braking test set out in section 10.33 and the parking brake system test set out in section 10.34.

**10.33.** (1) Subject to subsection (3), the downgrade braking test shall consist of

- (a) loading the equipment to the manufacturer's specified maximum gross weight, and stopping the equipment, from its test speed, on a hard, dry surface with a well compacted base and a uniform downgrade of 9% +/- 1%;
- (b) testing the service brake system a minimum of five times in succession, without change or adjustment of the braking system, from a machine speed of 50 km/h for surface equipment, 20 km/h for underground equipment or the maximum rated level speed of the equipment, if less; and
- (c) testing the secondary brake system a minimum of three times in succession, without change or adjustment of the braking system, from a machine speed of 25 km/h for surface equipment, 15 km/h for underground equipment or the maximum rated level speed of the equipment, if less.

(2) During the downgrade braking test

- (a) no more than 15 minutes shall elapse between each of the five service brake tests or three secondary brake tests and the entire service or secondary brake test shall not exceed 40 minutes;
- (b) auxiliary retarding devices shall not be used during the brake tests, except as permitted in paragraph (c);
- (c) auxiliary retarding devices may only be used during the secondary brake tests if the retarder and brake circuits are separate and independent systems and if the failure of a single component in the system will not render both the retarder and a portion of the braking system inoperative;
- (d) the stopping distances from the initial point of application of the brakes to the final stopped position shall be measured for each of the tests; and
- (e) the stopping distance shall not exceed that given by the following formula:
  - (i) SERVICE BRAKES  $S = V^2/(48-2.6D)$
  - (ii) SECONDARY BRAKES  $S = V^2/(34-2.6D)$
 where S is the stopping distance in metres, V is the initial speed at brake application in kilometers per hour and D is the percentage downgrade of the test ramp.

(3) Where it is impractical to conduct the downgrade braking test on a uniform downgrade of 9% +/- 1%, the manager may arrange for the test to be conducted on any

downgrade between 0% and 9% and any such test shall comply with the Society of Automotive Engineers' Standard SAE J-1473, Brake Performance - Rubber Tired Earth Moving Machines.

#### Parking Brake System Test

**10.34.** (1) The parking brake system test shall consist of loading the equipment to the manufacturer's specified maximum gross weight and parking the equipment on a 15% down grade in the forward and reverse direction with the power train disengaged.

(2) Where it is impractical to conduct the parking brake system test in accordance with subsection (1), the test may be conducted by applying a pulling force horizontally near the ground to achieve a minimum force equivalent to the specified grade in subsection (1).

(3) The parking brake system shall prevent equipment movement in either direction when tested in accordance with subsection (1) or (2).

#### Results

**10.35.** The downgrade braking and the parking brake test results shall be recorded in the equipment's maintenance record and a copy of the results shall be sent to the chief inspector within 14 days after the tests are completed.

#### Failure to Meet Standards

**10.36.** Where equipment fails to meet the minimum brake performance standards specified under section 10.33 or 10.34, the equipment shall be removed from service until it has been repaired and meets the standards.

#### Separation of Braking and Steering Systems

**10.37.** Where braking and steering systems are activated by fluid pressure and where portions of both systems use common components, the systems shall be designed so that no single component failure in one system shall adversely affect the other system.

#### Auxiliary Steering

**10.38.** (1) Where mobile equipment depends on power for steering and the loss of power might prevent the equipment from being steered manually, an auxiliary device shall be installed that will enable the operator to steer the equipment for a sufficient period of time to bring it to a safe stop.

(2) Where an auxiliary hydraulic pump is used to provide the emergency steering capability, the hydraulic fluid supplied to the pump shall be taken from a separate reservoir or from an isolated section of the main reservoir.

(3) Every auxiliary steering system put into service shall conform to the requirements of the Society of Automotive Engineers' Standard SAE J1511/ISO 5010, Steering for Off-Road Rubber Tired Machines.

#### Testing of Front Wheel Spindles

**10.39.** (1) The front wheel spindles of mobile equipment having a gross weight exceeding 45,000 kg and having a maximum speed exceeding 20 km/h, shall be non-destructively tested at least once every 12 months or in accordance with a schedule specified by the chief inspector.

(2) The results of a non-destructive test of the front wheel spindles shall be recorded in the equipment maintenance record and a copy of the results shall be sent to the chief inspector within 14 days after the test is completed.

#### Tires and Rims

**10.40.** (1) The manager shall ensure that safety procedures and equipment are in place for the inspection of, and performance of, any work on the tires or rims of rubber tired equipment.

(2) No person shall work on tires or rims unless authorized by the manager to do so.

(3) No tire shall be installed on any damaged, broken, bent or heavily rusted rim assembly.

(4) No mismatched parts of rims, wheels and tires shall be used in any wheel assembly.

#### Automatic Engine Shutdown

**10.41.** (1) Where automatic engine shutdown devices are employed on mobile equipment, audible and visual alarms shall be installed in the operator's cab to alert the operator that an automatic engine shutdown is imminent.

(2) Mobile equipment that is equipped with an automatic engine shutdown device shall be equipped with an auxiliary steering system that is automatically activated in the event of an automatic engine shutdown.

(3) Mobile equipment that is equipped with an automatic engine shutdown device shall be equipped with a shutdown override system to enable the operator to temporarily suspend automatic engine shutdown in order to bring the equipment to a safe stop.

#### Fire Suppression System

**10.42. (1) Mining equipment, that could present a fire hazard, shall be fitted with a multi-nozzle fire suppression system in the fire hazard area of the equipment.**

**(2)The fire suppression system shall provide for manual activation on both sides of the equipment notwithstanding that an operator's station may be situated on one side of the equipment.**

**(3)Activation of the fire suppression system shall also cause automatic engine shutdown.**

(4) Every unit of mobile equipment shall carry at least one fire extinguisher of adequate size and of the proper type.

(5) Every fire suppression system and every fire extinguisher shall be examined once a month to ensure that it is in good working order.

#### Roll-Over Protection

**10.43.** (1) All loaders, scooptrams, graders, scrapers, tractors, compactor rollers, skidders, rough terrain fork-lifts, bulldozers, off-highway haul trucks, mobile rock drilling equipment, **underground personnel carriers** and any other equipment when required by the chief inspector, shall be equipped with a rollover protective structure that conforms to one of the following standards:

(a) CSA B352-M 1980, Rollover Protective Structures for Agricultural, Construction, Earthmoving, Forestry, Industrial and Mining Machines; or

- (b) SAE J-1040, Surface Vehicle Standard Performance Criteria for Rollover Protective Structures (ROPS) for Construction, Earthmoving, Forestry and Mining Machines issued by the Society of Automotive Engineers and equivalent to ISO 3471/1-1986.

(2) Where the mobile equipment referred to in subsection (1) is used mainly for underground use,

- (a) the rollover protective structure design shall provide the operator with protection from falling ground and shall conform to the requirements of the standard SAE J-231, Minimum Performance Criteria for Falling Object Protective Structure (FOPS); and
- (b) the chief inspector may waive the requirement for physical testing of the rollover protective structure if he or she is satisfied that the other requirements of these regulations have been met.

(3) No addition, modification, welding or cutting of a rollover protective structure or falling object protective structure shall be permitted except in accordance with the instructions of a professional engineer.

(4) A professional engineer may re-certify a damaged, deformed or deteriorated rollover protective structure or falling object protective structure, after repairs have been made, if he or she is satisfied that the structural integrity has not been impaired.

**10.44.** Every rollover protective structure and falling object protective structure shall be designed and fitted in such a manner that the operator's field of vision is not restricted.

#### Information Required

**10.45.** The following information shall be permanently marked on a rollover protective structure or a falling object protective structure:

- (a) the name and address of the manufacturer or the professional engineer who certified the rollover protective structure or falling object protective structure;
- (b) the model and serial number;
- (c) the make, model and series of the machine for which the rollover protective structure or falling object protective structure is designed.

#### Other Overhead Protection

**10.46.** The manager shall ensure that a cab, screen or other adequate overhead protection is provided on

- (a) a power-driven crane, shovel or similar machine,
- (b) a fork-lift truck,
- (c) a front-end loader or other excavating machine, and
- (d) any other mobile equipment, where so required by the chief inspector,

where the operator may be exposed to overhead hazards on the surface, .

#### Personnel Carriers

**10.47.** (1) Vehicles or rail cars regularly or primarily used as personnel carriers shall

- (a) be of a design and construction acceptable to the chief inspector;
- (b) have a well constructed and properly secured seat, at least 500 mm wide (shoulder direction) for each passenger; and
- (c) be provided with non-slip access steps and functional handholds for ease of entry or exit.

(2) Personnel carriers that are enclosed with a cabin shall

- (a) not use curtains as side walls or doors;
- (b) be adequately illuminated and ventilated;

- (c) have rear or side doors equipped with latches operable from the inside and outside;
- (d) have at least one emergency exit, located on the side opposite the regular entrance door, equipped with a latch operable from inside and outside;
- (e) have all doors closed and latched while in motion;
- (f) when there is a bulkhead between the operator and the passengers, be equipped with a window that can be opened from either side, or other means of effective communication; and
- (g) have all glazing material conform to the specifications of ANSI Standard Z26.1-1977, Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways.

- (3) A person may carry personal hand tools or equipment on a personnel carrier when
- (a) the vehicle or rail car is not crowded;
  - (b) the tools and equipment are properly protected by guards; or
  - (c) the tools and equipment are isolated in separate containers.

(4) The maximum speed and the maximum load of a personnel carrier shall be posted in a conspicuous location on the vehicle or rail car.

#### Seat-Belts

**10.48.** Seat-belts of a type conforming with the recommended practice of the Society of Automotive Engineers' Standard SAE J-386, Operator Restraint Systems for Off-Road Work Machines shall be installed in all mobile equipment and the operator of the equipment shall wear the seat-belt when operating the equipment.

#### **10.49. repealed**

#### Travelling on Ramps

**10.50.** The manager shall establish the following restrictions for each unit of mobile equipment travelling on a haulage road or ramp:

- (a) the maximum load that can safely be carried;
- (b) the maximum downgrade speed for that unit;
- (c) the gear selection to be used.

**10.51.** The manager shall identify those areas of the mine where every vehicle other than the mining production equipment shall be equipped with

- (a) a tall whip antenna topped with a flag and light that are high enough to be visible to the operators of the mining equipment in the area; or
- (b) a flashing light mounted above the cab and bright enough to be visible to the operators of the mining equipment and to other persons in the area.

#### Vehicle Operation

**10.52.** Each person operating equipment is responsible for

- (a) safely operating and maintaining full control of the equipment in his or her care;
- (b) complying with all provisions of the Act and these regulations that relate to the operation of the equipment;
- (c) wearing the seatbelt if one is provided;
- (d) where required, travelling with the headlights, tail-lights, whip antenna light and flashing light on at all times;
- (e) complying with the requirements of the procedure referred to in section 10.04 and reading the log-book referred to in section 10.10; and
- (f) vacating the equipment, where the operator may be endangered during the loading or unloading cycle.

## Restricted Vision

**10.53.** (1) No person shall move any unit of mobile equipment where his or her field of vision is restricted unless he or she

- (a) has inspected the area into which the equipment is to be moved and, without delay, proceeds to move the equipment;
- (b) is directed by a signal person who is located in a safe position and is in continuous contact with the operator of the equipment; or
- (c) is directed by a traffic control or warning system.

(2) No person shall move any unit of mobile equipment in the vicinity of a drop-off unless a barrier has been erected to prevent equipment from going over the drop-off.

## Disabled Vehicles

**10.54.** Where mobile equipment is disabled or parked in the travelled portion of a roadway,

- (a) a warning to approaching traffic shall be given by means of flashing lights, lamps, flares or reflectors; or
- (b) a person, equipped to be clearly visible and identifiable, shall direct other vehicles using that section of roadway.

## Securing Equipment

**10.55.** The manager shall ensure that suitable devices are provided for supporting and blocking in a raised position the moving component of a truck dump box, bulldozer blade, grader blade, scraper blade, loader, backhoe bucket or fork-lift or crane load or similar type of moving component and that these devices are permanently attached for securing or locking the moving component in a raised position or are carried on the equipment for that purpose.

**10.56.** Where the lowering or moving of a raised truck dump box, bulldozer blade, grader blade, scraper blade, loader or backhoe bucket, fork-lift or crane load or any other moving component can endanger a person, the operator shall, before leaving the controls of the equipment, ensure that such moving component is in a lowered or blocked position to prevent it from moving unintentionally.

**10.57.** No person shall place himself or herself beneath a raised truck dump box, bulldozer blade, grader blade, scraper blade, loader or backhoe bucket, fork-lift or crane load or any other moving component unless the moving component has been securely and adequately blocked or otherwise secured independently of the normal operating controls.

## Transportation of Materials

**10.58.** (1) **Only the operator shall ride in a vehicle, train, or other unit of mobile equipment that is transporting equipment, material, or supplies, unless the vehicle, train, or other unit of mobile equipment is properly equipped to carry a passenger.**

(2) The operator shall ensure that the load on the vehicle, train or other unit of mobile equipment is adequately secured.

## ENGINES

### Internal Combustion Engines

**10.59.** (1) No internal combustion engine shall be installed, serviced, garaged or stored in or within 15 m of the building housing the hoist or within 30 m of any part of the collar of a shaft or any other opening to underground workings.



(2) The exhaust of an internal combustion engine that is temporarily or permanently operating within a building on the surface shall be conducted to a point outside the building and prevented from

- (a) re-entering the building;
- (b) entering the intake of any compressor;
- (c) contaminating the atmosphere of another building; or
- (d) contaminating mine workings.

(3) Unless a permit has been received from the chief inspector, the manager shall ensure that no internal combustion engine is used in an area of a surface building that is or is potentially a hazardous location, as defined in CSA Standard C22.1-94, Canadian Electrical Code, Part 1.

#### Diesel Engines

**10.60.** (1) The manager shall ensure that no internal combustion engine is used underground other than a diesel engine for which a permit has been issued by the chief inspector.

(2) A permit to use a diesel engine underground is only valid if the engine is operated and maintained

- (a) in good working condition;
- (b) in compliance with these regulations; and
- (c) at the location specified in the permit.

#### Equipment Details

**10.61.** (1) A record containing the following information shall be maintained for each diesel engine operating underground:

- (a) the make, size, model and serial number of the diesel engine;
- (b) the make, model and serial number of the equipment in which the diesel engine is installed;
- (c) the equipment or identification number assigned by the mine to the equipment in which the diesel engine is installed;
- (d) the quantity of ventilation in cubic metres per second;
- (e) the maximum rated power in kW;
- (f) the maximum speed at the maximum rated load in revolutions per minute;
- (g) the maximum fuel injection rate measured in kilograms per hour when the engine is operating at the maximum rated load and speed;
- (h) the results of any test made under paragraph 10.63(1)(b).

**(2) The manager shall, in consultation with the Committee, develop a procedure for the use and control of starter fluids acceptable to the chief inspector to ensure that**

- (a) no gasoline or other volatile fuel is used in the starting mechanism of diesel powered equipment underground;**
- (b) fuel used in diesel powered equipment has**
  - (i) a flash point greater than 43 °C when tested by a closed cup method, and**
  - (ii) a sulphur content less than 0.25% by weight; and**
- (c) no diesel powered equipment is operated unless the fuel injector pump and governor have been adjusted and sealed by the manufacturer or by a recognized fuel injection specialist to deliver the correct quantity of fuel as shown on the permit issued under subsection 10.60(1), and where a fuel injector pump does not have the seals intact, the engine shall not be used; and**

**(d) the undiluted and unscrubbed exhaust gases from diesel powered equipment is less than 1,500 ppm by volume of carbon monoxide.**

#### Ventilation Requirements

- 10.62.** (1) The manager shall ensure that
- (a) information regarding the minimum ventilation requirement for each piece of diesel powered equipment is placed in a conspicuous location on the equipment;
  - (b) a ventilation air flow schematic is prepared that shows the volume of air flowing in underground haulageways and work sites where diesel powered equipment is operating;
  - (c) the schematic required in paragraph (b) is placed in a conspicuous location close to the work site; and
  - (d) the ventilation information shown on the schematic is updated weekly in accordance with paragraph 10.63(1)(a).

(2) The ventilation quantity shall be at least 0.06 cubic m per second for each kilowatt of the diesel powered equipment operating at the work site.

**(3) Tests shall be made during every shift at the time of maximum exposure for the concentration of carbon monoxide and oxides of nitrogen at the operator's position and where persons work or pass in the vicinity of the equipment.**

**(3.1) The manager shall, in consultation with the Committee, establish a program to monitor respirable combustible dust to ensure that workers are not exposed to concentrations of respirable combustible dust that exceed the allowable limit.**

(4) Where the results of the tests undertaken pursuant to **subsection (3) and (3.1)**, show that the concentration of

- (a) carbon monoxide exceeds 25ppm,
  - (b) **nitrogen dioxides exceed 3ppm**, or
  - (c) respirable combustible dust exceeds 1.5 mg per m<sup>3</sup>,
- the manager shall ensure that immediate action is taken to reduce those concentrations below the limits set out in paragraphs (a) to (c).

**(5) The results of every test undertaken pursuant to subsections (3) and (3.1) shall be made available to the Committee.**

#### Ventilation Tests

- 10.63.** (1) The manager shall ensure that tests are conducted to determine
- (a) the volume of air flowing in underground haulageways and workings where diesel powered equipment is operating, at least weekly;
  - (b) the carbon monoxide content of the undiluted diesel engine exhaust gas, before and after the scrubber,
    - (i) immediately after repairs to the engine or exhaust system or both are made, and
    - (ii) at routine intervals for maintenance as recommended by the manufacturer, or in the absence of such a recommendation, at least monthly; and
- (c) at the request of an operator, the volume of air flow and the concentration of carbon monoxide, nitrogen dioxide, aldehydes or dust, of the atmosphere where the equipment is operating.**

- (2) The manager shall ensure that
- (a) the results of every test conducted under subsection 10.62(3) and subsection (1) are made available to the Committee; and

- (b) the results of every test conducted under subsection (1) are recorded and the records are kept at the mine.

## REMOTE CONTROL EQUIPMENT

### Encoder Devices and Frequencies

**10.64.** (1) Before any remote controlled equipment is introduced at a mine, the manager shall ensure

- (a) by selection of discrete encoder devices and operating frequencies, that only one receiver at a mine will respond to the signals from a given transmitter; and
- (b) that all forms of energy other than the specifically designed control signal will not render the equipment inoperative, uncontrolled or allow any unintended action or inaction by the remote controlled equipment.

(2) Where at contiguous mining properties there is a possibility that command signals from one property may be picked up by receivers at the other property, the managers of both mines shall ensure, through sharing of encoder and frequency information, that only the intended receiver will respond to a given transmitter signal.

(3) In the event of any dispute arising under subsection (2), either mine manager may request a ruling from an inspector whose decision shall be final and shall be adhered to by both parties.

### Working Area

**10.65.** Areas that are to be mucked out by remote controlled equipment shall be designed so as to

- (a) provide a safe location for the operator to work that allows a clear view of the working area unless the operator's view of the working area is enhanced with remote viewing assistance; and
- (b) prevent the equipment from operating beyond an area where the equipment could not be safely retrieved if it broke down.

### Presence of Other Persons

**10.66.** (1) The working area where any remote controlled equipment is operating shall be clearly marked and barricaded to restrict entry of unauthorized personnel or equipment into the working area.

(2) The manager shall prepare a procedure for the safe interaction of manually operated equipment authorized to enter into the working area of the remote controlled equipment and each operator shall be instructed on

- (a) the procedure to be followed; and
- (b) when the operator of the manually operated equipment must vacate the equipment during the work cycle.

(3) Any person having reason to approach a machine operating under remote control shall only do so after deactivating and locking out or tagging the remote control transmitter.

### Control System Failure

**10.67.** Remote controlled mobile equipment shall be rigged to stop in the event of the failure of all or part of the control system, the power supply or the control cord.

### Manual Controls Immobilised

**10.68.** Remote controlled mobile equipment shall have manual travel controls locked out or gated so that they cannot be accidentally engaged by movements of the equipment.

#### Safety Devices on Transmitters

- 10.69.** Every remote control transmitter shall be equipped with
- (a) a prominently located emergency stop button, the operation of which immediately applies the brakes and stops the equipment if the transmitter is switched on;
  - (b) a device that automatically acts in the same manner as the emergency stop button if the transmitter is tilted more than 15% from the level position;
  - (c) a remote control system lock-out switch assembly for deactivating and locking out the transmitter;
  - (d) devices to activate the mobile equipment's
    - (i) service brake, secondary brake and park brake control,
    - (ii) steering control,
    - (iii) fire suppression system activator control, and
    - (iv) automatic engine shutdown override control;
  - (e) a duplication of the mobile equipment brake and operating systems warning devices; and
  - (f) clear identification, in a prominent location, of the mobile equipment with which it is to **be used if applicable.**

#### Arming Procedure

**10.70.** (1) Every remote control transmitter and receiver system shall be designed to require the following two separate steps, executed in a priority sequence, before the operator can activate the remote control system:

- (a) firstly, the operator must activate the control device mounted on the receiver of the remote controlled equipment;
- (b) secondly, the operator must activate the control device mounted on the transmitter.

(2) The operator shall not activate the transmitter control until he or she is in a safe location.

#### Safe Location

**10.71.** (1) Remote controlled equipment shall only be operated by the operator where he or she is in a safety bay or other safe location that is not accessible by the remote controlled equipment.

(2) No maintenance work or servicing shall be performed on a remote controlled equipment unit unless the transmitter unit has been locked out.

#### RAISE CLIMBERS

##### Design Details Required

**10.72.** Before a raise climber is introduced at a mine, the manager shall submit to the chief inspector the design drawings and technical specifications of the installation noting the materials of construction, rated load capacities, dimensions, operating controls and safety systems.

##### Certificate and Permit Required

**10.73.** (1) A new or used raise climber shall not be put into service unless

- (a) a certificate has been obtained from the manufacturer or from a professional engineer competent in the design of hoisting equipment, certifying

- (i) the maximum load capacity and maximum operating speed of the conveyance,
  - (ii) that all critical load-bearing components of the complete assembly and accessories have been inspected and non-destructively tested, and
  - (iii) that the raise climber has successfully completed its commissioning tests; and
- (b) the chief inspector has issued a permit to operate the raise climber.

(2) A permit to operate a raise climber is only valid if the equipment is operated and maintained in good working condition in compliance with the regulations and at the location specified in the permit.

(3) No person shall load a raise climber beyond the maximum amount shown on the certificate.

(4) No alterations designed to increase the maximum load capacity or speed of a raise climber shall be made unless approval is given by its manufacturer or a professional engineer competent in the design of hoisting systems and the chief inspector has been notified of the proposed alterations.

#### Design

**10.74.** The design of every load bearing component of a raise climber and of its associated equipment, including the conveyance, shall meet the requirements of sections 11.46 and 11.47.

#### Identification Plate

**10.75.** Every raise climber shall have a durable and legible identification plate attached to the conveyance showing

- (a) the name of the manufacturer, the date of manufacture, the model number and a serial number; and
- (b) the certified maximum allowable load and speed of the conveyance.

#### Brakes

**10.76.** (1) A raise climber shall be equipped with

- (a) at least two separate and independently operated service brakes, each capable of safely stopping and holding the conveyance under all rated conditions of load and speed; and
- (b) an automatic overspeed brake capable of bringing the conveyance to a safe stop from a predetermined overspeed under any rated load condition.

(2) Each braking system on a raise climber shall be capable of being tested independently.

(3) The brakes on a raise climber shall be activated immediately if the motive power supply to the raise climber is interrupted.

(4) The braking system design shall ensure that the failure of any single component still leaves sufficient braking capacity to bring the conveyance to a safe stop.

**10.77.** Every raise climber shall have, in the event of an interruption of the motive power supply, service brakes that are capable of

- (a) being operated manually by a person in the conveyance to lower it safely under continuous control; or
- (b) being released manually, if another brake is available in the conveyance that can be used by a person to lower it safely under continuous control.

## Electrical Equipment

**10.78.** (1) An electrically powered raise climber shall not be operated in excess of 750 v and shall be protected by a ground fault system.

(2) All electrical equipment, including switches, connectors, wiring and cables shall be designed, installed and weather-proofed to ensure the safety of persons near or at the the raise climber under any operating conditions.

(3) The operating controls and electrical panels of an electrically powered raise climber shall be capable of being locked out to prevent unauthorized operation.

(4) An emergency switch shall be provided in the cab of every electrically powered raise climber that automatically cuts off the power supply to the drive motors if the main control contactor fails to open or in any other emergency situation.

**10.79.** The electrical supply to a raise climber shall be disconnected while explosives and caps are being loaded in preparation for blasting.

## Operating Controls

**10.80.** All operating controls of a raise climber shall be located in a convenient position to allow for their safe operation.

## Stop Blocks

**10.81.** (1) The end of the track on which a raise climber travels shall be provided with a stop block to prevent the conveyance from being taken beyond the track.

(2) A power driven raise climber shall be provided with devices which automatically stop the conveyance at the upper and lower limits of travel.

## Daily and Weekly Examinations

**10.82.** (1) In addition to the pre-operating checks and maintenance inspections for the raise climber required by section 10.04,

- (a) the operator shall, before operations are commenced each operating shift, test the raise climber through its full range of movements to ensure that all limit switches, brakes, controls, audio and visual indicators and signals are functioning correctly;
- (b) the operator shall test the overspeed brake at least once each operating day; and
- (c) a competent person shall, at least weekly, carry out an inspection of the raise climber and associated equipment and perform routine servicing and inspection of all safety and protective devices to ensure that they are operating correctly.

(2) A record of all prescribed tests, inspections and maintenance work conducted and any defects, damage or problems noted shall be entered in the raise climber's log-book.

(3) Before recommencing operations after a prolonged shutdown, a full inspection of the raise climber and associated equipment shall be conducted by authorized persons.

## Annual Non-Destructive Tests

**10.83.** At least once every 12 months or more frequently as required by the chief inspector, the critical load-bearing components of a raise climber's complete assembly and accessories shall be non-destructively tested and

- (a) the test results shall be recorded in the log-book; and

- (b) a copy of the test results shall be sent to the chief inspector within 14 days after the tests are conducted.

#### Prohibition

**10.84.** Except for the purposes of conducting an inspection, no person shall ride on a raise climber's work platform while it is in motion.

#### Ascending After Blasting

**10.85.** The manager shall establish the correct procedure to be followed by the operator when ascending the raise after blasting operations, to ensure that the condition of the guide rails and rack ahead of the conveyance is carefully examined.

#### Cover

**10.86. A protective cover shall be provided and used as required above any work platform during raise driving with a raise climber where the inclination of the raise is greater than 60 degrees from the horizontal.**

#### Procedure Prior to Work

**10.87.** Before any work is conducted from a raise climber work platform, all brakes shall be applied and the platform shall be securely anchored to the raise climber's guide rails.

#### Loading and Transporting Materials

**10.88.** (1) The manager shall establish procedures for loading and transporting materials on a raise climber.

(2) Only the operator and those employees authorized and required to handle the load shall ride in a raise climber that is transporting equipment, materials or supplies.

#### Signs

**10.89.** Suitable barriers and signs bearing the words "Persons Working Above" shall be installed at the bottom of every raise where a raise climber is operating.

#### Emergency Procedures

**10.90.** (1) Means shall be readily available to enable persons who are up a raise in a raise climber conveyance to descend in the event of a power failure or other emergency situation.

(2) The manager shall ensure that operators of raise climbers and any other persons who may be involved in an emergency descent of persons, are trained in the use of the emergency equipment.

**10.91.** A suitable fire extinguisher shall be carried in every raise climber conveyance.

#### Communication

**10.92.** An effective means of communication shall be provided between a raise climber conveyance and the base from which it operates and if there are intermediate levels or landings serviced by the conveyance, the chief inspector may require the installation of a suitable signalling system.

## RAIL HAULAGE

### Design Details Required

**10.93.** (1) Before a rail haulage system is introduced at a mine, the manager shall submit to the chief inspector the design drawings and technical specifications of the installation noting the materials of construction, rated load capacities, dimensions, operating controls and safety systems.

- (2) The manager shall ensure that
  - (a) the rail haulage system is maintained in a safe working condition and is operated in a safe manner; and
  - (b) a procedure is developed for the safe interaction and operation of the mining plant rail system where it interconnects with a rail system of another company.
- (3) The manager shall ensure that
  - (a) low clearance warning devices and signs are installed where track passes under an overhead structure and the clearance between the underside of the structure and the top of any rail car is less than 2 m;
  - (b) guard rails are installed at the approach to tracks where the view is obstructed in one or both directions;
  - (c) the requirements of section 10.64 have been complied with before a remote control or automatic control system for the operation of a locomotive or rail haulage system is introduced;
  - (d) in addition to the requirements of section 11.85, a procedure is prepared for the use of radio communication systems on a rail haulage system;
  - (e) only authorized persons ride on a train;
  - (f) one or more persons are stationed to direct the operator of a locomotive when the operator backs a train in a location where persons may be endangered;
  - (g) no rail car is permitted to run free unless,
    - (i) adequate control of the rail car is maintained, and
    - (ii) there is no hazard to a person;
  - (h) a train has a tail light on the last rail car and is equipped with a suitable beam or flashing tail-light where the train may be required at any time to proceed in reverse; and
  - (i) where, on the surface at a mine or at a mining plant, the clearance between the sides of a train and a parallel train or motor vehicle or the wall of a building or other structure is less than .5 m, the location is plainly marked showing the hazard.

### Locomotive Haulage Unit

- 10.94.** (1) A locomotive shall
- (a) have brakes that will stop and hold the train from full speed and under full load conditions on the maximum grade;
  - (b) have a suitable headlight for each direction of travel;
  - (c) have an audible warning alarm system;
  - (d) be provided with a fixed seat for the operator;
  - (e) have a guard that will provide protection for the operator in a collision or other impact;
  - (f) when operated by remote control or by an automated system, be so arranged that in the event of failure of all or part of the control or system, the train is immediately brought to a safe stop;
  - (g) where powered by a storage battery or from a trolley wire, have control levers so arranged that they cannot be removed accidentally when the power is on;
  - (h) be equipped with a dead-man control switch rigged to bring the train to a safe stop immediately; and



(i) in addition to the requirements of section 10.42, be equipped with suitable fire extinguishers and, if required, a fire suppression system.

(2) The person manually operating a locomotive shall

- (a) only operate the equipment when in the proper position at the controls;
- (b) remain at the controls when operating the equipment;
- (c) before leaving the equipment unattended,
  - (i) set the controls in position for parking,
  - (ii) set the brakes, and
  - (iii) place wheel chocks to prevent movement of the equipment;
- (d) sound the audible warning alarm
  - (i) where a person may be endangered by the movement of the train, or
  - (ii) when the train is about to move; and
- (e) where the materials in a rail car extend beyond the length of the rail car, ensure that the rail car is pulled and not pushed by the locomotive.

(3) Every trolley locomotive shall be operated with the trolley pole in the trailing position, unless there is no room to reverse the pole, in which case the locomotive shall be operated at average walking speed or slower.

#### Rail Track Switches

**10.95.** (1) The rail track shall be equipped with an effective stop block, automatic derail or safety switch at the

- (a) entrance to a shaft station; and
- (b) top of each tracked incline plane, except where a rail car remains attached to the hoisting cable.

**10.96.** (1) Every person opening a stop block or removing a derail switch shall close or replace it immediately after the equipment has cleared the stop block or derail switch.

(2) A rail track switch which could trap a person's foot shall have guards at the frog and switch point to effectively protect against the hazard.

#### BOILER PLANTS, COMPRESSOR PLANTS AND AIR HEATING PLANTS

##### Boilers, Compressors and Pressure Vessels

**10.97.** (1) Boilers, compressors and pressure vessels and associated piping and fittings shall be installed and maintained in accordance with CSA Standard B51-95, Boiler, Pressure Vessel and Pressure Piping Code, and the heated or refrigerated fluid plant shall comply with the requirements of the Boiler and Pressure Vessels Act and the regulations under that Act.

(2) A boiler, compressor or pressure vessel to which the Boiler and Pressure Vessels Act and the regulations under that Act do not apply shall be maintained in a proper and safe condition by a qualified person.

(3) Before a boiler, compressor or pressure vessel and associated piping and fittings are installed, the manager shall submit to the chief inspector all design drawings and technical specifications of the installation, which drawings and specifications shall meet the requirements of CSA Standard B51-95, Boiler, Pressure Vessel and Pressure Piping Code and any other requirements of the chief inspector.

(4) No part of a boiler shall be installed within 25 m of any part of the collar, hoist room, portal or any other opening to underground workings.

## Air Compressors

- 10.98.** (1) An air compressor that is driven by a prime mover exceeding 25 kW, is lubricated by oil and discharges air into a compressed air system with over 100 kPa pressure, shall be
- (a) designed and installed and maintained so as to minimize the risk of fire or explosion due to accumulations of carbonaceous deposits in the air discharge lines;
  - (b) equipped with shutdown devices that will prevent the operation of the compressor if
    - (i) the temperature of the discharged air, cooling water, cooling air or lubricant exceeds the safe operating range specified by the manufacturer, or
    - (ii) the flow or pressure of the compressor lubricant is below normal; and
  - (c) equipped with a temperature indicating device that
    - (i) monitors the high-pressure air discharge temperature, and
    - (ii) is marked with the normal operating temperature point or range on the device.
- (2) The shutdown devices required by subsection (1)
- (a) shall not be capable of automatically restarting the compressor after being tripped;
  - (b) shall be tested at least monthly; and
  - (c) shall not be used unless they function correctly.
- (3) An air compressor shall not be used if any shutdown device is inoperative.

## Carbon Monoxide Monitor

- 10.99.** (1) The manager shall ensure that all compressed air supply systems that are used to supply underground workings with compressed air are continuously sampled by a carbon monoxide monitor installed in the discharge air stream of the compressor.
- (2) The carbon monoxide monitoring system shall, when the carbon monoxide sampled reaches 25 ppm, sound an alarm and
- (a) cause the immediate shut down of all the compressors connected to the air supply that is being sampled; and
  - (b) shut off any supply of air into the air supply system.
- (3) The failure of any component of the carbon monoxide monitoring system or the control devices or an interruption of the power supply to the monitoring system or the control devices shall cause the monitoring system to
- (a) sound an alarm;
  - (b) immediately shutdown all the compressors connected to the air supply that is being sampled; and
  - (c) shut off the sampled compressed air supply.
- (4) The manager shall ensure that the carbon monoxide monitoring system is working by testing the system at least monthly and recording the results in the compressor's maintenance record.

## Prohibition

- 10.100.** No person shall transfer liquids or solids from one location or container to another location or container by the application of air under pressure except where equipment specifically designed for that purpose is used.

## Gas Fired Equipment

**10.101.** (1) All gas fired appliances, equipment and pipelines shall be installed and maintained in accordance with the standard CAN/CGA-B149.1-M95, Natural Gas Installation Code and CAN/CGA-B149.2-M95, Propane Installation Code, and the system shall comply with the requirements of the Gas Protection Act and the regulations under that Act.

(2) Any gas fired appliance and equipment to which the Gas Protection Act and the regulations under that Act do not apply shall be maintained in a proper and safe condition by a qualified person.

(3) Before a gas fired appliance and associated equipment, piping and fittings are installed, the manager shall submit to the chief inspector all design drawings and technical specifications of the installation as set out in the standard CAN/CGA B149.1-M86, Natural Gas Installation Code and CAN/CGA-B149.2-M95, Propane Installation Code and as required by the chief inspector.

(4) In addition to the requirements of sections 10.18 and 10.19, all parts of a gas fired appliance or equipment, with the exception of embedded pipes or ducts, shall be readily accessible for inspection, maintenance, repair and cleaning.

(5) Pipelines with gas pressures in excess of 3.45 kPa shall not be located within 15 m of any mine opening to underground.

(6) Pressure regulating stations shall be clearly marked and protected from physical damage.

(7) A propane storage tank shall be so located that a leak of its contents does not enter any mine openings to underground.

## Mine Air Heating Plants

**10.102.** (1) No furnace or device for heating mine air shall be installed without the written permission of the chief inspector.

(2) The heating system shall be protected from freezing.

(3) A vibration switch that will shutdown the heater at a vibration limit specified by the manufacturer shall be mounted on the fan bearing.

(4) The manager shall ensure that, where mine air is heated by any method of direct fired air heating, the mine air is continuously sampled by a carbon monoxide monitor installed in the discharge of the air heater system and the carbon monoxide monitor shall

(a) when the carbon monoxide sampled reaches 25 ppm, sound an alarm and cause the immediate shut down of the air heater system; and

(b) sound an alarm and cause the immediate shut down of the air heater system on the failure of any component of the monitoring system or control devices or in the event of an interruption of the power supply to the monitoring system or control devices.

(5) The manager shall ensure that the carbon monoxide monitoring system is working by testing the system at least monthly.

(6) The results of the test referred to in subsection (5) shall be recorded in the direct fired heater's log-book.

## Heaters

**10.103.** All heaters, including portable heaters, shall conform to the relevant sections of the following codes, and where there is conflict between the provisions of the codes the more stringent provisions shall prevail:

- (a) CSA Standard CAN/CSA-B139-M91, Installation Code for Oil Burning Equipment;
- (b) CAN/CGA-B149.1-M86, Natural Gas Installation Code;
- (c) CAN/CGA-B149.2-M95, Propane Installation Code;
- (d) CSA Standard C22.1-94, Canadian Electrical Code, Part 1;
- (e) CSA Standard B51-95, Boiler, Pressure Vessel and Pressure Piping Code.

## FUEL PIPELINES - UNDERGROUND MINES

### Prohibition

**10.104.** Except for the actual fuel tanks of operating equipment, no gasoline, liquid fuel or gaseous fuel shall be stored within 50 m of the collar of a shaft or other entrance to an underground mine unless approved in writing by the chief inspector.

### Fuel Storage Tanks

**10.105.** Every fuel storage tank shall be

- (a) equipped with a means of accurately determining the amount of fuel it contains;
- (b) have signs identifying its contents and indicating that it is a fire hazard area; and
- (c) be surrounded by a dike or curb capable of containing 110% of its storage capacity.

### Underground Fuel Pipeline

**10.106.** Where a fuel pipeline is used in an underground mine it shall

- (a) be constructed of minimum standard weight wrought iron or steel pipe or a material having equivalent strength, durability, corrosion and fire resistance;
- (b) have leak proof joints and, if used, sealants or gaskets shall be of a type or design approved by Underwriters Laboratories of Canada for fuel oil service;
- (c) be designed, installed, and used in accordance with the manufacturer's specifications;
- (d) be clearly identified as a fuel pipeline;
- (e) be pressure tested before initial use to 345 kPa above atmospheric, or 1.5 times the maximum working pressure, whichever is greater, and the pipeline shall retain the pressure for at least two hours after the source of pressure has been removed; and
- (f) not pass through garages, switch rooms, explosive magazines, or refuge stations.

**10.107.** In an underground mine where a fuel pipeline is used to carry fuel from an underground storage tank, the manager shall ensure that the pipeline is

- (a) fully drained after completion of each fuel transfer; and
- (b) visually inspected at least monthly.

### Fuel Storage Tanks in a Fuel Transfer Pipeline

**10.108.** Fuel storage tanks in a fuel transfer pipeline shall

- (a) be constructed of steel and designed in accordance with good engineering practice for their location and use;
- (b) be supported and anchored to prevent excessive stress concentration on any supporting portion of the shell, and located to minimize the risk of damage; and
- (c) have vent pipes of sufficient size, located so that fumes are directed away from any place where they could be a hazard to health or safety.

**10.109.** Fuel storage tanks in a fuel transfer pipeline shall be designed in accordance with the standard NFPA 122 Fire Prevention and Control in Underground Metal and Non-metal

Mines, 1995, except where any requirement of that standard conflicts with a requirement of this Part in which case the requirements of this Part prevail.

#### Fuel Transfer System

**10.110.** The electrical equipment of a fuel transfer system shall comply with section 20 of CSA Standard C22.1-94, Canadian Electrical Code, Part I.

**10.111.** A fuel transfer system shall be equipped with a fire suppression system and shall have adequate fire extinguishers.

**10.112.** A fuel transfer system shall be designed and installed so that

- (a) only a pre-set quantity of fuel can be transferred at one time, and this quantity shall be less than 90% of the available storage capacity of the receiving tank at the time of transfer;
- (b) when the receiving tank is full, a sensing device will stop the flow of fuel at the sending tank;
- (c) a person at the sending tank and one at the receiving tank have suitable communication so that the flow of fuel can be stopped at any time; and
- (d) the controls and switches at the tanks are clearly marked as to their functions.

**10.113.** Where fuel transfer lines are installed in a shaft, fuel transfer shall not be conducted during hoisting operations.

**10.114.** An authorized person shall be responsible for ensuring that the system is regularly cleaned and properly maintained, and that all procedures are strictly followed.

#### PIPING SYSTEMS

**10.115.** (1) Piping systems that have an internal lining or that contain substances that are corrosive, flammable, toxic or have a hazardous pressure or temperature, shall

- (a) be designed in compliance with section 10.01; and
- (b) be marked by a system of identification acceptable to the chief inspector such as that set out in the standards
  - (i) ANSI Z53.1-1979, Safety Colour Code for Marking Physical Hazards", or
  - (ii) ANSI A13.1-1981 (R1985), Scheme for the Identification of Piping Systems.

(2) The manager shall ensure that

- (a) a procedure is established for locking out and testing a piping system before the system is worked on; and
- (b) workers are trained in the identification system.

(3) The marking shall be maintained in a legible condition.

(4) Any new installations and, where identifiable, any existing buried pipelines, power cables and storage tanks, shall be plotted on accurate surface mine plans and where required by the inspector, shall be identified by a system of stakes or signs on the surface acceptable to the inspector.

#### Plastic Pipe and Fittings

**10.116.** Plastic pipe and fittings shall

- (a) comply with CSA Standards B137.0-93, Definitions, General Requirements and Methods of Testing for Thermoplastic Pressure Piping and B137.3-93, Rigid Polyvinyl Chloride (PVC) Pipe For Pressure Applications;
- (b) be properly supported;
- (c) not be used for the main supply or discharge of compressed air or water in mine shafts; and

(d) not be forced around bends that may unreasonably stress the pipe or its fittings.

## CONVEYORS

### Prohibitions

**10.117.** (1) No person shall ride on a conveyor belt.

(2) No person shall cross over a conveyor belt except at an established foot bridge not less than .5 m in width equipped with guardrails.

### Conveyors

**10.118.** (1) Every accessible section of a conveyor shall be provided with a pull cord to stop the conveyor in an emergency and the controls shall be arranged so that they have to be reset manually before

the conveyor can be restarted after an emergency stop.

**(2) On every conveyor that can be started automatically by remote control or where the operator has limited visibility of the whole conveyor, an audible start up warning device shall be sounded continuously for 10 seconds before the conveyor is set in motion.**

(3) **All accessible head**, tail, drive and tension pulleys of a conveyor shall be effectively guarded at their nip points and the guards shall extend for a distance of at least 1 m from the nip point.

(4) The travelway of a tension pulley counterweight shall be guarded or located to prevent

- (a) inadvertent entry to the travelway by a person; and
- (b) injury to a person should the tension pulley and counterweight system become detached from its fastenings.

(5) Guards shall be provided beneath a conveyor where

- (a) a person may contact the conveyor when he or she passes under it; or
- (b) materials or parts falling from the conveyor may endanger a person.

(6) A belt conveyor shall be equipped with a belt slip detection device to stop the drive motor in the event of belt blockage or slippage.

(7) Where servicing or cleanup under or around a moving conveyor belt is required, sections 10.18 to 10.20 apply.

(8) Conveyor belting for use in an explosive atmosphere, in the transportation of coal and in all underground locations, shall meet the requirements of the standard CAN/CSA-M422-M87, Fire Performance and Antistatic Requirements for Conveyor Belting or an equivalent standard accepted by the chief inspector.

(9) Every belt conveyor in use underground shall be equipped with an effective automatic fire suppression system at the drive pulley to minimize the risk of fire due to belt slippage on the drive pulley, and an effective fire suppression system shall be installed at any other location along the length of the belt where required by the chief inspector.

## SMELTING

**10.119.** (1) The manager shall ensure that

- (a) procedures are established for protection of personnel where a person is exposed to the hazard of molten materials; and
  - (b) personal protective equipment, shields, appliances or other devices, in good condition, are provided to the persons exposed to the hazard of being burned by molten metal.
- (2) No person shall perform any smelting work unless
- (a) the person is wearing the proper personal protective equipment required for the safe operation of the equipment; and
  - (b) the personal protective equipment is in good condition.

#### Precautions Concerning Molten Metal

**10.120.** (1) Precautions shall be taken to prevent contact between molten material and damp, rusty or cold surfaces, moisture, water or other substances where such contact may cause an explosion.

(2) Precautions shall be taken to prevent spillage of molten material from a ladle, slag pot or similar vessel where such spillage may endanger a person.

(3) A ladle, slag pot or similar vessel shall be examined immediately before use, and shall not be used for molten material if it is found to be defective or contaminated by a substance that may cause an explosion.

#### Miscellaneous Tools and Equipment

**10.121.** (1) The manager shall identify and supply all suitable personal protective equipment to be worn by the operator for the safe operation of all miscellaneous tools including grinders, chain saws, pneumatic tools and all power activated tools.

- (2) No person shall use any miscellaneous tool unless
- (a) the person is authorized to use the tool;
  - (b) the person is wearing the proper personal protective equipment required for the safe operation of the equipment; and
  - (c) the personal protective equipment is in good condition.

#### Grinders

**10.122.** (1) A grinder shall be assembled, adjusted and operated in accordance with the manufacturer's specifications.

(2) The maximum speed at which a grinding wheel can be safely operated shall be indicated on the grinding wheel or shall be easily obtainable by the operator.

- (3) A grinding wheel shall be
- (a) enclosed by a protective hood capable of withstanding the impact of a bursting wheel, except for the area at the workrest;
  - (b) stored where it will not be damaged by impact, moisture, extreme heat or cold; and
  - (c) stopped when the grinder or workrest is being adjusted.

(4) The workrest on a grinder shall be mounted above the centre line of the grinding wheel at a point where the edge of the workrest is not greater than 3 mm from the wheel unless the manufacturer specifies otherwise.

(5) An air operated grinder shall have a governor to prevent it operating in excess of the rated speed of the grinding wheel.

(6) The governor required by subsection (5) shall be inspected regularly and shall be maintained in proper condition.

(7) Powered grinding wheels, other than portable hand held machines, shall be equipped with an exhaust system or other means for removing dust produced during the grinding operation.

#### Chain Saws

**10.123.** Chain saws shall meet the requirements of CSA Standard CAN3-Z62.1-94, Chain Saws.

#### Pneumatic Tools

**10.124.** (1) Portable pneumatic nailing and stapling tools shall require two separate operations to activate the tool including, as the first operation, the placing of the tool against the work surface.

(2) Under no circumstances shall the operating trigger on pneumatic nailing and stapling tools be taped or otherwise secured in the "on" position.

(3) The air supply shall be disconnected before the tool is serviced or any adjustments made.

(4) The safe operating air pressure specified by the manufacturer for tools, hoses and fittings shall not be exceeded.

#### Power Activated Tools

**10.125.** (1) Explosive activated fastening tools shall conform with the standard CAN/CSA Z166-1975, Explosive Actuated Fastening Tools.

(2) When in storage an explosive tool and shells shall be kept in separate locked containers only accessible to authorized persons and the shells shall

- (a) be identified as to size and strength;
- (b) be kept in containers which contain only one size and strength; and
- (c) not be left unattended except when in storage.

(3) An explosive tool shall be maintained in proper condition and serviced in accordance with the recommendations of its manufacturer, and the operator shall ensure each time before use that the barrel of the explosive tool is clean and free from any obstruction.

#### WINCHING AND HOISTING EQUIPMENT

##### Lifting and Pulling Devices

**10.126.** (1) Lifting devices, pulling devices or utility hoists shall be

- (a) provided with an identification plate listing the manufacturer, serial number and maximum load capacity of the unit;
- (b) provided with an overwind protection device if the unit is power operated; and
- (c) used in a manner that minimizes shock loading.

(2) Any temporary or permanent attachment used to connect a lifting device, pulling device or utility hoist to its load or to its support or anchorage system shall be in good condition and appropriate for its use.



(3) The maximum load that a lifting device, pulling device or utility hoist and its support or anchorage system can carry shall be posted in a location visible to the operator and, except during testing, shall not be exceeded.

(4) The manager shall ensure that each component that may affect the safe operation of a lifting device, pulling device or utility hoist and its support or anchorage system is examined and tested by a qualified person before initial use and thereafter at intervals not exceeding one year, and a record shall be made and kept for inspection showing the date, findings and name of the person performing the examination and test.

#### Overhead Travelling Cranes

**10.127.** (1) All overhead travelling production cranes and general service cranes shall be

- (a) provided with an identification plate listing the manufacturer, serial number and maximum load capacity of the unit;
- (b) provided with an overwind and an overrunning protection device; and
- (c) used in a manner that minimizes shock loading.

(2) A new or used production crane or service crane shall not be put into service unless

- (a) a certificate has been obtained from the manufacturer or from a professional engineer competent in design of hoisting equipment, certifying
  - (i) the maximum load capacity and maximum operating speed of the hoisting system, and
  - (ii) that all critical load-bearing components of the complete assembly and accessories have been inspected and non-destructively tested; and
- (b) all the commissioning tests specified by the manufacturer have been successfully completed and the requirements of CSA Standard B167-95, Safety Standard for Maintenance and Inspection of Overhead Cranes, Gantry Cranes, Monorails, Hoists and Trolleys have been met.

(3) A production crane shall be provided with

- (a) a safe means of access and egress for the operator from the cab mounted on the crane when the crane
  - (i) is parked in the normal parking position, and
  - (ii) cannot be brought to the normal parking position; and
- (b) an alarm by which the operator can warn persons that may be endangered by the moving crane.

(4) A service crane shall be provided with an audible and visible alarm to warn persons in the vicinity of the crane when the crane is operating on

- (a) pendant control, where the operator of the crane does not have a clear view of the area in which the crane is operating; or
- (b) radio frequency control.

(5) Every production crane and service crane shall be provided with

- (a) protection against inadvertent operations by radio frequencies when equipped with radio frequency controls;
- (b) an operating procedure to guard against colliding with other cranes on the same track;
- (c) a means by which the power conductors for the crane can be safely disconnected from the source of electrical supply; and
- (d) a switch or circuit breaker by which the maximum power to the crane can be safely interrupted from the cab on the crane, unless the crane collectors can be safely removed.

(6) In addition to the requirements of subsections 11.21(2) and (3), the operator of a production crane shall hold a subsisting hoist operator's medical certificate.

(7) Where a production crane is operating on a continuing shift basis, the next crane operator shall give warning to, and receive acknowledgement from, the operating crane operator before stepping onto the crane.

#### Mobile Lifting Equipment

**10.128.** (1) Every crane, shovel, excavator, dragline, boom truck or similar type of equipment that raises, lowers or swings a load or materials during its work cycle shall be

- (a) provided with an identification plate listing the manufacturer, serial number and maximum load capacity of the unit;
- (b) provided with a durable rating chart securely fixed on an easily accessible part of the equipment that gives the following information:
  - (i) the serial number of the equipment,
  - (ii) the manufacturer's rated load for all permissible combinations of boom length, operating radius and direction of lift and alternate ratings covering the use of any auxiliary components,
  - (iii) a notation indicating whether the rated load is based on the stability of the equipment or on the structural competence of its components,
  - (iv) the recommended sizes and types of ropes and reeving for the various loads and uses,
  - (v) any precautionary or warning statement considered necessary by the manufacturer for the safe operation of the equipment;
- (c) provided with an overwind and overrunning protection device;
- (d) provided with a device that indicates at all times the boom's inclination to the operator; and
- (e) used in a manner that minimizes shock loading.

(2) A new or used crane, shovel, excavator, dragline, boom truck or similar type of equipment shall not be put into service unless

- (a) a certificate has been obtained from the manufacturer or from a professional engineer competent in the design of hoisting equipment, certifying
  - (i) the maximum load capacity and maximum operating speed of the hoisting or lifting system, and
  - (ii) that all critical load-bearing components of the complete assembly and accessories have been inspected and non-destructively tested; and
- (b) all the commissioning tests have been successfully completed.

(3) In addition to the requirements of sections 10.13 to 10.15, an operator of a crane, shovel, excavators, dragline, boom truck or similar type of equipment shall be qualified in accordance with a program acceptable to the chief inspector.

#### Operations

**10.129.** (1) In addition to the requirements of sections 10.126 to 10.128, only authorized persons shall operate the equipment referred to in those sections and the operator shall not

- (a) leave the operator's position until the operating controls have been placed in the stationary position, with the brakes set and the load supported so that it cannot move; and
- (b) raise or lower a load, except during testing, in excess of the rated load capacity of the equipment.

(2) No person shall ride or be permitted to ride

- (a) on the load being carried by the equipment; and
- (b) on the equipment except
  - (i) the operator, where the equipment is manually operated, and any trainee or supervisor, and

- (ii) a person performing inspections, testing or repairs on the equipment in accordance with procedures established by the manager for the safety of the persons doing the inspection or repair work.

(3) The operator shall operate the equipment so that no part of the load will pass over a person.

(4) A signal person or system shall be used to direct the equipment where the movement of the load is not visible to the operator at all times.

(5) The signal person shall ensure that the path of the load is clear by warning all persons to move away from the load path area until the load has cleared their area.

#### Safety Procedures

**10.130.** (1) In addition to the requirements of sections 10.126 to 10.128, the manager shall ensure that the operator

- (a) checks and inspects all safety devices and components that could affect the safe operation of the equipment before it is first used on that shift; and
- (b) retests the braking systems before making any heavy lifts greater than 80% of the maximum rated lifting capacity.

(2) The load bearing components of a production crane, service crane, mobile crane, shovel, excavator, dragline, boom truck and similar equipment shall be inspected at regular intervals as recommended by the manufacturer and non-destructively tested at intervals not exceeding 12 months.

(3) A record of every inspection and the results of every non-destructive test shall be entered in the equipment's maintenance record and in the equipment's log-book and a copy of the results of every non-destructive test shall be sent to the chief inspector within 14 days of the test.

(4) No hoisting equipment shall be operated where

- (a) in respect of the hoist rope,
  - (i) the number of broken wires in one lay length exceeds 5% of the total in the rope, or
  - (ii) defects that seriously affect its strength are known to exist;
- (b) a person is in the vicinity of the wheel tracks unless precautions have been taken to ensure his or her safety;
- (c) any device that may affect safe operation is found to be faulty; and
- (d) the load exceeds the load rating of the equipment, except for the purpose of testing.

(5) Where at any time a bridge section, boom section or jib section of a production crane, service crane, mobile crane, shovel, excavator, dragline, boom truck or similar type of equipment is modified or repaired, the work shall be done by or under the direct supervision of the manufacturer's representative or a professional engineer competent and experienced in this type of work, and the manager shall obtain a certificate from the manufacturer's representative or the professional engineer either confirming the original load rating as shown on the rating chart for the equipment or listing the reduced load ratings.

#### CERTIFICATE, PERMIT REQUIRED FOR ELEVATOR AND MANLIFT

##### Certificates and Permits

**10.131.** (1) A new or used elevator or manlift shall not be put into service unless

- (a) a certificate has been obtained from the manufacturer or from a professional engineer competent in the design of hoisting equipment, certifying
  - (i) the maximum load capacity and maximum operating speed of the system,
  - (ii) that all critical, load-bearing components of the complete assembly and accessories have been inspected and non-destructively tested, and
  - (iii) that the elevator or manlift has successfully completed its commissioning tests; and
- (b) the chief inspector has issued a permit to operate the equipment.

(2) A permit is only valid if the equipment is operated and maintained in good working condition in compliance with these regulations and at the location specified in the permit.

(3) No elevator or manlift shall be loaded beyond the maximum amount shown on the certificate.

(4) No alterations designed to increase the maximum load capacity or speed shall be made unless approval is given by its manufacturer or a professional engineer competent in the design of hoisting systems and the chief inspector has been notified.

#### Standards

**10.132.** (1) Every elevator and manlift shall be installed and maintained in accordance with whichever of the following codes is applicable to the elevator or manlift:

- (a) CAN/CSA-B44-94, Safety Code for Elevators;
- (b) CAN/CSA-B311-M1979, Safety Code for Manlifts.

(2) Notwithstanding the requirements of the codes referred to in subsection (1), elevator cars and counterweights shall be provided with overspeed control devices.

(3) The critical, load-bearing components of the complete assembly and accessories of an elevator or manlift shall be

- (a) inspected at intervals not exceeding one month, and
  - (b) non-destructively tested at intervals not exceeding 12 months,
- and the results shall be recorded in the log-book for the elevator or manlift.

(4) A copy of the results of the non-destructive test shall be sent to the chief inspector within 14 days after the test.

(5) An elevator shall

- (a) have a safe means of access to the machinery room which access shall be located outside the hoistway;
- (b) not have hoisting or balance ropes that are spliced;
- (c) have the access to the machinery room restricted to authorized persons;
- (d) have an alarm by which a person stranded in an elevator can alert persons outside the elevator; and
- (e) have its controls and machine parts protected against physical damage, moisture, dust or extreme temperatures.

(6) The machinery room of the elevator shall be kept clean and shall contain only those materials required for the elevator.

#### Platforms

**10.133.** (1) The manager shall ensure that a procedure is established for the safe operation, maintenance, inspection and testing of all portable or mobile platforms, scaffolding, bosun's chairs and other types of temporary work or access platforms.

(2) Portable or mobile platforms, scaffolding, bosun's chairs and other types of temporary work or access platforms shall be installed and maintained in accordance with the manufacturer's instructions or the instructions of a professional engineer.

(3) A portable or mobile platform that is installed on or supported by a unit of mobile equipment shall be securely attached

- (a) to the equipment by pins or welding that prevent accidental dislodgement; or
- (b) where it slides on the forks or in the bucket of the equipment, by safety chains that attach to the equipment.

(4) A portable or mobile platform shall not be suspended from the mobile equipment by ropes, chains or cables.

(5) A portable or mobile platform shall be equipped with handrails on at least three sides and where possible with a handrail on the fourth side, and the upper handrail shall meet the requirements of sections 1.91 and 1.92.

(6) Before a portable or mobile platform is raised, the mobile equipment supporting it shall be secured and properly stabilized to prevent inadvertent movement of the equipment and platform.

(7) Any person on a portable or mobile platform shall wear a safety harness secured to a suitable anchor.

(8) A person shall not be transported on a portable or mobile platform unless the movement of the platform amounts only to minor position adjustments.

(9) The operator of mobile equipment supporting a portable or mobile platform

- (a) shall only respond to the signals of the designated signal person on the platform; and
- (b) shall not leave the controls of the mobile equipment while there is a person on the platform.

(10) No person shall be raised or lowered or permit himself or herself to be raised or lowered by any hoist, derrick, crane or similar device unless

- (a) a procedure for the safe raising or lowering has been established by the manager;
- (b) the device was examined and tested before being used to raise or lower the person; and
- (c) the person being transported is visible at all times to the hoist operator or there is a device by which the hoist operator and the person being raised or lowered can exchange movement signals.

(11) A person using a bosun's chair, suspended scaffold or mobile staging shall be protected by an independently anchored fall arrest system if he or she could fall from or with the chair, scaffold or staging.

## WELDING AND CUTTING

### Standards

**10.134.** (1) All electric and gas welding or cutting equipment and installations shall conform to the manufacturer's recommendations and the standard CAN/CSA W-117.2-94, Safety in Welding, Cutting and Allied Processes.

(2) The manager shall ensure that all gas cylinders at the mine site are certified and are subsequently recertified every five years.

## Hot Work

**10.135.** (1) The manager shall ensure that a hot work procedure is established and no person shall use any electric and gas welding or cutting equipment or perform any hot work unless authorized under the procedure.

- (2) The hot work procedure required by subsection (1) shall provide that
- (a) before any welding, cutting or heating takes place in an area, all flammable fume sources and materials are removed from the area or their hazards are neutralized;
  - (b) where cylinders of gas are used for supply of welding or cutting equipment, precautions are taken to avert the possibility of damage to the equipment by
    - (i) securing the cylinders so as to prevent their falling at any time while in use, and
    - (ii) protecting the cylinders, regulators, manifolds, hoses and fittings used in conjunction with the welding or cutting equipment from sparks, flames or other hazards that could come into contact with the cylinders, regulators, hoses and fittings;
  - (c) before any gas welding, cutting or heating equipment is used, the person using the equipment shall ensure that it is free from defects and leaks and that
    - (i) only standard fittings designed and manufactured for the specific gas service are used,
    - (ii) flashback arrestors are installed on each regulator to prevent reverse gas flow,
    - (iii) no copper fittings or tubing are used on the flammable gas line system,
    - (iv) the oxygen cylinders, valves, regulators and fittings are protected from coming into contact with any oil or grease from any source, and
    - (v) any flammable gas cylinder that has been laid on its side shall be placed in an upright position for at least 30 minutes before the high pressure valve is opened for use;
  - (d) the high pressure valve on the oxygen cylinder and flammable gas cylinder is closed when a welding, cutting, brazing or heating activity is completed;
  - (e) the regulators and manifolds are removed and the valve protection cover or cap is secured on each cylinder at least hand-tight when the cylinders are being moved or are not in use;
  - (f) no welding, cutting, brazing or heating is done on any container in which an explosive, flammable or unknown substance has been stored unless
    - (i) the substance has been completely removed, and
    - (ii) the work has been made non-flammable or non-explosive;
  - (g) no explosive, flammable or unknown substance shall be put into a container on which welding, cutting, brazing or heating work has been done until the container has cooled off sufficiently to prevent ignition of the substance;
  - (h) a second person is present and attends to the oxygen and flammable gas high pressure shut-off valves and regulators when the cylinders are set up
    - (i) in a position that is not readily accessible to the person welding, cutting, brazing or heating, or
    - (ii) in a conveyance where a person is welding, cutting, brazing or heating on or from the conveyance; and
  - (i) no electric arc welding or cutting is conducted unless
    - (i) insulated conductors of adequate size are used to carry the welding current to and from the work to the welding machine, unless another safe feed and return path has been provided, and
    - (ii) all persons exposed to the direct radiation from the arc flash are protected by suitable eye protection or screens and partitions.

(3) In addition to the requirements of subsections (1) and (2), the manager shall ensure that a written hot work permit is required for the safe use of welding, cutting, brazing, heating or other hot work equipment in any area underground or in any headframe, hoist

room, hoist electrical room, shafthouse, portal, ventilation fan building or other surface building in which a fire could endanger the access or ventilation to the underground workings.

(4) A hot work permit shall be signed by the supervisor in charge of the mine to ensure it is safe to proceed before the hot work is commenced.

(5) A hot work permit shall set out

- (a) the type of work to be performed;
- (b) the location of the work;
- (c) when the work is to be done;
- (d) all special measures, procedures and precautions to be taken before, during and after the work including
  - (i) examination of the adjacent areas to the hot work place for all sources of potential fire hazards before the work is begun and when the work is stopped, and on at least one other occasion between one and two hours after the work is stopped,
  - (ii) the availability of fire fighting equipment suitable for extinguishing any potential fire during the work and until the one to two hour examination required by subparagraph (i) has been completed, and
  - (iii) wetting down, where the hot work is conducted in a timbered area of the shaft or in a fire hazard area, the adjacent areas before the work is begun and after the work is stopped; and
- (e) that no hot work is to be done within 20 m of the place where any explosive is stored or is being transported.

(6) No person shall perform any hot work in a hot work permit area without a duly authorized hot work permit.

(7) Notwithstanding subsection (3), a hot work permit is not required for welding, cutting, brazing or heating work conducted in a repair shop or garage in the hot work permit area equipped for such work.

(8) Subparagraph (5)(d)(iii) does not apply where wetting down may create a hazard as a result of freezing or the presence of electrical equipment.

(9) The manager shall ensure that each welding machine and each set of oxygen and flammable gas cylinders in use is equipped with a fire extinguisher that

- (a) has a capacity for extinguishing a fire that is equal to or greater than a minimum Underwriters' Laboratories of Canada classification of 1A, 10B; and
- (b) is suitable for class A and B fires.

(10) The manager shall ensure that persons are protected from fumes, gases, dust, vapours and noise produced during a welding, cutting, brazing or heating operation and that

- (a) where general ventilation at the work is not sufficient a local exhaust system is used to minimize the exposure by persons to airborne contaminants produced by the operation; and
- (b) procedures are established to reduce noise levels for persons using welding, burning, cutting, brazing or heating equipment and for persons working in the vicinity.

(11) The manager shall ensure that the procedure referred to in subsection (10) includes provision for

- (a) suitably designed welding and cutting equipment;
- (b) isolation of the welding and cutting area;
- (c) installation of sound absorbing materials in the work site; and
- (d) scheduling of work.

## Oxygen and Flammable Gas Cylinders

**10.136.** (1) The manager shall ensure that oxygen and flammable gas cylinders are stored in an upright position in clearly identified and well ventilated storage areas that are kept free from any flammable fumes and materials, electrical apparatus and wiring, and that the stored cylinders are protected from any heat sources in excess of 55° C and from direct sunlight.

- (2) Stored oxygen cylinders shall be kept separate from the flammable gas cylinders by
- (a) a space of at least 6 m; or
  - (b) a 1.5 m high non-combustible barrier with a fire resistant rating of at least 30 minutes.

(3) Flammable gas cylinders shall be clearly labelled as to the identity of the gas and any cylinder that is not clearly labelled shall not be used.

(4) Oxygen and flammable gas cylinders shall be transported in an upright position and properly secured on a special carrier or container designed for the purpose and the cylinders shall be fitted with securely fastened approved valve protection caps.

## Gas Underground

**10.137.** The manager shall ensure that

- (a) no calcium carbide or other flammable gas producing chemicals or flammable gas generating device is taken underground in a mine; and
- (b) no propane or other similar gaseous fuel that is heavier than air, is used or taken underground except where it is
  - (i) used for a welding, cutting or heating operation, and
  - (ii) taken in a certified cylinder that does not contain more than 2.7 kg of flammable fuel capacity.

## PART XI

### HOISTS AND SHAFTS

#### Shaft Design

**11.01.** (1) A mine shaft shall

- (a) be designed in accordance with good engineering practice;
- (b) be constructed in accordance with a design and plans that have been certified by a professional engineer;
- (c) be equipped to guide each conveyance through the shaft to prevent contact with another conveyance or with any shaft furnishing;
- (d) have underwind clearances that exceed the stopping distance of any conveyance when travelling at the maximum speed permitted by the hoist controls and carrying the maximum permitted load, except
  - (i) during shaft sinking operations, or
  - (ii) when chairs are used to land a skip during loading operations; and
- (e) be equipped with devices acceptable to the chief inspector and designed to decelerate and safely stop the conveyance in the event that it travels beyond those limits.**

(2) Except when a shaft is being sunk or during sump cleaning operations, a barrier or obstruction shall be installed in the shaft to prevent a conveyance from being lowered into water in the shaft bottom.



(3) A water level sensing device that is activated by a rising water level in the shaft shall be installed below the barrier or obstruction.

(4) The water level sensing device installed pursuant to subsection (3) shall be equipped with an alarm that gives an audible warning signal in the hoist room, on the lowest active working level, and at the loading pocket if it is below the lowest active working level.

#### Shaft Lining

**11.02.** (1) A shaft shall be lined.

(2) During shaft sinking operations the lining shall be maintained to within 20 m of the bottom of the shaft.

#### Shaft Compartments and Stations

**11.03.** (1) Except during shaft-sinking operations, a shaft compartment shall be securely enclosed with a substantial partition at the collar and at all levels except the side or sides on which material is loaded on or off the conveyance, where a substantial door shall be installed.

(2) The partition required by subsection (1) shall

- (a) extend above the collar and each level a distance equivalent to the height of the conveyance plus 2 m;
- (b) extend below the collar and each level a distance of at least 2 m; and
- (c) conform to the size of the conveyance, allowing for necessary operating clearances.

(3) The door required by subsection (1) shall

- (a) be designed to withstand the impact of a unit of mobile equipment running into it;
- (b) be kept closed except when the conveyance is being loaded or unloaded at the level; and
- (c) have only a minimal clearance beneath it.

(4) The approach to any shaft compartment shall be designed and protected to prevent inadvertent entry of an uncontrolled vehicle into the shaft.

#### Shaft Manways

**11.04.** A manway in a shaft shall be separated from the hoisting or counterweight compartments by a partition consisting of metal or other material of suitable weight and mesh to prevent

- (a) a falling object from entering the manway; or
- (b) the intrusion of an object from the manway into the hoisting compartment.

**11.05.** A safe passageway and standing room for a person outside the shaft shall be provided at all levels opening into the shaft and the manway shall be directly connected with such openings.

#### Shaft Obstructions

**11.06.** (1) Protective devices and procedures shall be used to prevent a conveyance from coming into contact with a planned shaft obstruction.

(2) A device that may become a shaft obstruction shall be positively latched out of the shaft compartment to prevent its inadvertent projection into the compartment.

(3) The location of each shaft obstruction shall be marked on the depth indicator of the hoist.

(4) The manager shall prepare a procedure for safely working with shaft obstructions before a shaft obstruction is installed and shall place the procedure in the hoist operator's log-book and post it in other appropriate locations.

(5) For purposes of this section, doors covering the shaft at the collar to facilitate the maintenance of a conveyance do not constitute a shaft obstruction if

- (a) the doors are positively latched out of the shaft compartments when not in use; and
- (b) dual lights are installed to indicate to the hoist operator whether such doors are in or out of the shaft compartment.

#### Use of Buckets

**11.07.** (1) A bucket shall only be used for shaft sinking operations and any concurrent preliminary development work.

(2) The bucket shall not be less than 1.07 m in height and shall be designed in accordance with section 11.47 and certified in accordance with section 11.46.

(3) Where the distance between a head sheave and the shaft bottom exceeds 100 m, a crosshead shall be used with the bucket.

(4) The crosshead shall

- (a) land on at least two chairs at the bottom crosshead stop to prevent distortion;
- (b) be attached to the rope by a safety appliance to ensure that the bucket is stopped if the crosshead jams in the shaft; and
- (c) be of a type that encloses the bucket unless the shaft compartment is tightly lined and the bucket is barrel shaped.

**11.08.** Dual lights shall be installed within view of the hoist operator to indicate

- (a) that the crosshead and the bucket are descending the shaft together after leaving the dumping position; and
- (b) whether the service doors or the dump doors are in or out of the shaft hoisting compartment.

#### Service Doors

**11.09.** (1) During shaft sinking operations, service doors shall be installed at the collar and at any other place in the shaft in order to cover the shaft compartments where the bucket is loaded or unloaded and the doors shall

- (a) automatically latch in the open position by mechanical means whenever the service doors are not covering the hoisting compartment;
- (b) be closed whenever a bucket is being loaded or unloaded with tools or other materials; and
- (c) be closed whenever persons are entering or leaving the bucket except where a closed crosshead is in use that provides equivalent protection for persons.

(2) The service doors and support structures shall be designed in accordance with section 11.47 and certified in accordance with section 11.46.

#### Dump Doors

**11.10.** (1) During shaft sinking operations, dump doors shall be installed at the bucket dumping position and arranged so as to

- (a) prevent a bucket from being dumped when the doors are in the open position;

- (b) prevent any material from falling down the shaft when the bucket is being dumped; and
- (c) automatically latch out by mechanical means whenever they are not covering the hoisting compartment.

(2) The dump doors and support structures shall be designed in accordance with section 11.47 and certified in accordance with section 11.46.

#### Filling Buckets

**11.11.** A bucket shall not be

- (a) filled so that loose rock or materials project above the level of its rim;
- (b) allowed to leave the top or bottom of the shaft until it has steadied; and
- (c) moved above creep speed when picking up or chairing its crosshead.

#### Riding in Bucket

**11.12.** (1) No person shall ride in a bucket when it is transporting materials.

(2) Every person being transported by a bucket shall ride in the bucket.

#### Lowering Bucket

**11.13.** A bucket being lowered to the shaft bottom shall

- (a) be stopped at a distance of not less than 5 m and not more than 10 m above the bottom of the shaft; and
- (b) be lowered slowly beyond the point referred to in paragraph (a) only on a separate signal given by the person in charge of the bucket.

#### Blasting Precautions

**11.14.** (1) On the first lowering of a bucket to the shaft bottom after a blasting operation, the bucket shall

- (a) be stopped not less than 15 m above the blasting set or bulkhead or above any other point in the shaft where the health or safety of the persons could be endangered; and
- (b) be lowered slowly beyond the point specified in paragraph (a) only on a separate signal given by the person in charge of the bucket.

(2) The number of persons carried in the bucket shall not be greater than the number required to make a proper examination of the parts of the shaft that might have been affected by the blast.

#### Overhead Protection

**11.15.** During shaft sinking operations,

- (a) persons may be at the bottom of the shaft during the bucket hoisting and dumping cycles if the service doors referred to in section 11.09 and the dump doors referred to in section 11.10 are closed; and
- (b) no work shall be done in a shaft while persons are in another part of the shaft below such work unless there is a securely constructed covering over a sufficient portion of the shaft to protect the persons below from the danger of falling material.

#### Drawings of Mine Hoisting Plant

**11.16.** (1) Clear and reproducible preliminary and final certified drawings and specifications of the mine hoisting plant shall be submitted to the chief inspector before any work is started on a new plant or revisions are made to an existing plant.

(2) "As built" drawings shall be submitted to the chief inspector as the work progresses and when it is completed.

#### Mine Hoist Certificate

**11.17.** (1) No hoist shall be put into service unless a certificate has been obtained from the manufacturer of the hoist or from a professional engineer competent in the design of mine hoists certifying

- (a) the maximum rope pull;
- (b) the maximum suspended load;
- (c) the maximum unbalanced load;
- (d) the maximum hoist speed; and
- (e) the maximum stalling torque that can be developed by the hoist system.

(2) No hoist shall be loaded beyond the maximum amount shown on the certificate required by subsection (1).

(3) No alterations shall be made to increase the hoisting capacity of a hoist unless approval is given by its manufacturer or by a professional engineer competent in the design of mine hoists.

#### Mine Hoist Permit

**11.18.** (1) Except for the purpose of testing a mine hoist before it is put into service in a particular location, no mine hoist shall be operated without a valid mine hoist permit issued by the chief inspector.

(2) A mine hoist permit is valid only if the hoist is installed, maintained and operated in compliance with the regulations and at the location specified in the permit.

(3) A copy of the mine hoist permit shall be posted in the hoist room.

#### Conveyance Permit

**11.19.** (1) No conveyance shall be used in a shaft without a valid shaft conveyance permit.

(2) A shaft conveyance permit shall be obtained from the chief inspector, and a copy shall be posted in the hoist room.

(3) A shaft conveyance permit is valid only if the conveyance is installed, maintained and operated in compliance with these regulations and at the location specified in the permit.

(4) No conveyance shall be loaded with more than the maximum number of persons or weight of material specified in the shaft conveyance permit, and a notice showing the specified limits shall be posted at the collar.

(5) In determining the maximum weight of materials for the shaft conveyance permit, the chief inspector shall take into consideration the maximum load that a mine hoisting plant is capable of carrying safely.

(6) The maximum number of persons that may be carried in a conveyance shall not exceed the ratio of clear floor area divided by 0.2 square m for each person.

## Commissioning Tests

**11.20.** (1) Commissioning tests shall be conducted on a new, modified or reactivated mine hoisting plant to ensure compliance with these regulations.

(2) The results of commissioning tests shall be recorded and a copy of the report shall be sent without delay to the chief inspector.

(3) The person responsible for commissioning the mine hoisting plant shall be a professional engineer who shall certify the results of the commissioning tests.

(4) No mine hoisting plant shall be placed into operation before the commissioning tests have been successfully completed and the manager has received the applicable permits.

## Hoist Operator's Certificate

**11.21.** (1) No person shall operate or be permitted to operate a hoist unless he or she holds a subsisting medical certificate and

- (a) holds a valid hoist operator's certificate; or
- (b) in the case of the person being trained to operate the hoist, he or she is under the direct supervision of a person with a valid hoist operator's certificate.

(2) A person operating a hoist, or a person operating a production crane shall

- (a) be physically and mentally fit to discharge the duties of a hoist or crane operator;
- (b) undergo a medical examination by a physician before commencing working as a hoist or crane operator and every 12 months thereafter; and
- (c) obtain a medical certificate from the physician certifying that the person is physically fit to operate a hoist or a crane and is not subject to any infirmity of body or mind that may interfere with the duties of a hoist or a crane operator.

(3) A medical certificate

- (a) shall be kept available for inspection; and
- (b) expires 12 months after its date of issue.

(4) A hoist operator's certificate automatically expires

- (a) if the medical certificate is not renewed; or
- (b) five years after the date of issue.

## Headframe Design

**11.22.** (1) A headframe shall

- (a) be designed in accordance with good engineering practice;
- (b) be constructed in accordance with a design and plans that have been certified by a professional engineer;
- (c) be of sufficient height to provide an overwind distance above the upper track limit that exceeds the greater of 3 m or twice the stopping distance of the conveyance or counterweight travelling at the maximum speed permitted by the hoist controls; and
- (d) be equipped in each compartment with
  - (i) tapered guides, or with other devices that are approved by the chief inspector, are located above the limits of regular travel of the conveyance and are designed to decelerate and safely stop the conveyance in the event that it travels beyond **those limits, or**
  - (ii) safety chairs or other devices at the extreme limit of overwind travel that are designed to stop and hold a fully loaded conveyance and, where applicable, the full weight of balance ropes, and the installation shall be so arranged so that if a conveyance should break away from the rope as a result of an overwind, it would fall back the smallest practical distance before landing on

the safety chairs.

(2) Unless otherwise approved by the chief inspector, a headframe shall be designed to withstand the simultaneous application of forces equivalent to the breaking strength of each hoist rope.

(3) In the design referred to in subsection (1), due consideration shall be given to the sudden reversal of hoisting rope forces and oscillations that would occur if a hoist rope broke at its maximum breaking strength.

## ROPES AND SHEAVES

### Sheaves

**11.23.** (1) Before a shaft rope sheave is used, a certificate shall be obtained from the manufacturer or from a professional engineer certifying

- (a) its maximum rated load carrying capacity;
- (b) the diameter of rope for which it is designed;
- (c) the maximum breaking strength of the rope for which it is designed; and
- (d) the maximum amount of groove wear that is permissible.

(2) No shaft rope sheave shall be loaded beyond its maximum rated load carrying capacity or used otherwise than in compliance with the certificate required by subsection (1).

**11.24.** The ratio of the sheave groove diameter to the rope diameter shall be the same as that required by section 11.58 for the drum hoist.

**11.25.** A shaft rope sheave shall

- (a) be made of materials that can safely withstand the ambient temperatures that occur where it is installed;
- (b) have a groove or inserts with a groove appropriate for the rope being used; and
- (c) bear a serial number and the date of its manufacture.

### Rope Attachments

**11.26.** (1) Each component of the suspension gear between a conveyance, counterweight, bucket and single or multi-deck work platform and a hoisting or tail rope shall have a factor of safety when new of not less than 10.

(2) Components of suspension units between a hoisting or tail rope and a conveyance, counterweight, bucket and single or multi-deck work platform shall not be welded.

(3) No rope attachments shall be used unless the attachments are

- (a) designed for the rope;
- (b) in sound condition; and
- (c) re-certified at least once every five years of use as being in sound condition by the manufacturer or by a professional engineer.

(4) A shaft rope shall be attached to the suspension gear of a conveyance, counterweight, bucket and single or multi-deck working platform by a closed type device that cannot be inadvertently disconnected.

**11.27. In a drum hoist installation, the drum end of the hoist rope shall be securely fastened to the spider of the drum.**

**11.28.** When the rope attachments for a shaft hoisting or tail rope are first installed or reinstalled after dismantling, the following shall be performed before the hoist is put into service:

- (a) two test trips of the conveyance shall be made through the working part of the shaft, with the conveyance
  - (i) carrying its normal maximum load for a hoist rope, and
  - (ii) empty for a tail rope;
- (b) the attachments shall be examined by an authorized person upon completion of the test trips and any necessary adjustments shall be made;
- (c) a record of the test trips, examination and any adjustments made shall be entered in the hoisting machinery record book by the person making the tests, examinations or adjustments.

#### Rope Certificate

**11.29.** No shaft rope shall be used or installed unless it is accompanied by

- (a) a certificate from the manufacturer giving the
  - (i) name and address of the manufacturer and the coil or reel number, date of manufacture and type, length and diameter of rope, and
  - (ii) weight per unit of length, number of strands, number of wires in each strand, class of core, diameter of wires, breaking stress of steel from which the wire is made, and the type of rope lubricant used; and
- (b) a test certificate issued by a rope testing laboratory reporting the results of
  - (i) the breaking test of the rope,
  - (ii) the breaking strength extension,
  - (iii) the torsion test of the wires, and
  - (iv) the condition of the wires and the rope lubricant.

#### Rope Record Book

**11.30.** (1) The manager shall ensure that the following information is entered in the rope record book for each shaft rope:

- (a) rope data required by section 11.29;
- (b) date of purchase;
- (c) date of installation;
- (d) identification number;
- (e) name of shaft and compartment in which the rope is used;
- (f) weight of conveyance;
- (g) maximum weight of material carried;
- (h) maximum length and weight of rope in service;
- (i) factor of safety.

(2) The rope record book shall

- (a) contain a complete history of each shaft rope, including
  - (i) the date it was installed, shortened and removed, and
  - (ii) the date of each destructive and non-destructive test and a summary of each such test; and
- (b) be a two part book with one page for submission to the chief inspector.

#### Notice to the Chief Inspector

**11.31.** (1) When a shaft rope is installed, the manager shall without delay send copies of the relevant pages of the rope record book to the chief inspector together with a copy of the test certificate and manufacturer's certificate required by section 11.29.

(2) When a shaft rope is taken out of service, a notice giving the date and reason for removal from service shall be sent to the chief inspector.

## Rope Test Certificate

- 11.32.** (1) Before a shaft rope is installed,
- (a) a 2.5 m representative sample shall be cut from the rope and sent for destructive testing to a rope testing laboratory acceptable to the chief inspector; and
  - (b) a test certificate showing the information required by section 11.29 shall be obtained from the rope testing laboratory.

(2) A shaft rope that has been in storage for more than 12 months shall be retested in accordance with subsection (1) before the rope is installed.

## Destructive Testing

- 11.33.** After a hoist rope has been in service for six months on a drum hoist, and at subsequent intervals not exceeding six months, the manager shall ensure that
- (a) a 2.5 m length is cut off from the lower end of the rope above the clamps, the cut ends securely bound and the sample sent for a destructive testing to a rope testing laboratory acceptable to the chief inspector;
  - (b) a test certificate showing the information required by section 11.29 shall be obtained from the rope testing laboratory; and
  - (c) the test certificate shall be sent without delay to the chief inspector.

## Rope Electromagnetic Test

- 11.34.** (1) A qualified person, acceptable to the chief inspector, shall test each shaft rope throughout its working length with an electromagnetic rope testing device approved by the chief inspector
- (a) within six months of a shaft rope being put into service and at subsequent intervals not exceeding four months; and
  - (b) for a hoist rope, at intervals shorter than four months if an extrapolation of previous test results indicates that the loss of breaking strength of the hoisting rope could exceed 10% before the next regular test.

(2) A record of every electromagnetic rope test performed, including graphs and their interpretation signed by the person making the interpretation, shall be sent to the chief inspector within 14 days after completion of the test.

## Test Specimens

- 11.35.** (1) The chief inspector may require that samples be cut from a shaft rope that has been removed from service for special testing at a rope testing laboratory.

(2) Subject to the appropriation of moneys by the Legislature of the Northwest Territories, the Government of the Northwest Territories shall pay the costs of the testing referred to in subsection (1).

## Used Rope

- 11.36.** (1) No rope shall be used as a shaft rope if it has been spliced.

(2) No shaft rope that has been removed from a shaft and that has not been discarded shall be reinstalled in a shaft without the written permission of the chief inspector.

## Minimum Rope Diameter

- 11.37.** The minimum nominal diameter of a hoisting rope shall not be less than
- (a) 16 mm, where a conveyance is supported by a single rope; and



(b) 13 mm, where a conveyance is supported by more than one rope.

#### Factors of Safety

- 11.38.** The factor of safety of a hoist rope installed on a drum hoist shall not be less than
- (a) 8.5 at the point where the rope is attached to the conveyance when the rope is carrying its maximum permissible load; and
  - (b) 5.0 at the point where the rope leaves the head sheave when the conveyance is carrying its maximum permissible load and is at its lowest point of normal travel in the shaft.
- 11.39.** The factor of safety of a hoist rope installed on a friction hoist
- (a) shall not be less than the greater of 5.5 or the value obtained from the formula  $8.0 - 0.00164d$ , where  $d$  is the maximum length of rope in metres in the shaft compartment below the head sheave or the friction hoist drum; and
  - (b) shall be the lowest actual breaking strength as determined by a testing laboratory, multiplied by the number of hoist ropes, divided by the cumulative weight of the conveyance, attachments, hoist and tail ropes in the compartment plus the maximum conveyance design load.
- 11.40.** The factor of safety of a tail or balance rope shall not be less than 7.0.
- 11.41.** The factor of safety of a guide or rubbing rope shall not be less than 5.0.
- 11.42.** No hoist rope that has been in use for two years shall remain in service without the written permission of the chief inspector.
- 11.43.** No rope shall remain in service as a shaft rope when its breaking strength is determined to be less than the following percentage of the breaking strength shown on the test certificate required by section 11.29:
- (a) in any part of a hoist rope, 90%;
  - (b) in any part of a multi-layer, multi-strand balance rope, 90%;
  - (c) in any part of a single layer, stranded balance rope, 85%;
  - (d) in any part of a guide or rubbing rope, 75%.

#### Rope to be Removed

- 11.44.** Notwithstanding sections 11.42 and 11.43, no rope shall remain in service as a shaft rope if
- (a) the extension of a test piece of the rope has decreased to less than 60% of the original extension shown on the test certificate required by section 11.29 or marked corrosion or a considerable loss in wire torsion strength has occurred;
  - (b) the number of broken wires, excluding filler wires, in any section of the rope equal to one lay length exceeds 5% of the total number of wires in the rope, excluding filler wires; or
  - (c) the rate of stretch in a hoist rope installed on a friction hoist shows a rapid increase over the normal rate of stretch recorded during its service.

#### Hoisting Stopped

**11.45.** Where, hoisting is discontinued or suspended in a shaft, each hoist rope shall be removed immediately from the shaft unless otherwise approved by the chief inspector.

#### CONVEYANCES AND INSTALLATIONS

**11.46.** (1) Before installation, a certificate shall be obtained for a conveyance, counterweight, bucket, rock loading pocket, rock dump pocket, set of shaft sinking service doors and dump doors, and single or multi-deck work platform showing

- (a) its rated load, as certified by the manufacturer or a professional engineer; and
- (b) its serial number, date of manufacture and the name of the manufacturer.

(2) A certificate issued pursuant to subsection (1) ceases to be valid on the fifth anniversary of its date of issue.

(3) Before a certificate referred to in subsection (1) is first issued or before such a certificate ceases to be valid pursuant to subsection (2), the manager shall ensure that the manufacturer or a professional engineer conducts such examinations and tests as may be necessary to ensure that each conveyance, counterweight, bucket, rock loading pocket, rock dump pocket, set of shaft sinking service doors and dump doors, and single or multi-deck work platform meets the requirements of section 11.47.

(4) Where the manufacturer or a professional engineer determines that a conveyance, counterweight, bucket, rock loading pocket, rock dump pocket, set of shaft sinking service doors and dump doors and single or multi-deck work platform meets the requirements of section 11.47, the manufacturer or professional engineer may issue the certificate referred to in subsection (1).

**11.47.** (1) All parts of a conveyance, bucket, rock loading pocket, rock dump pocket, set of shaft sinking service doors and dump doors, and single or multi-deck work platform, when carrying the rated load, shall be capable of withstanding at least four times the maximum allowable design stress without permanent distortion.

(2) All parts of a suspension system used to sling equipment underneath a conveyance or crosshead shall be capable of withstanding at least four times the maximum allowable design stress without permanent distortion.

(3) The maximum allowable design stress shall be established by good engineering practice and shall include the effects of

- (a) the weight of the conveyance, counterweight, bucket, rock loading pocket, rock dump pocket, shaft sinking service and dump doors and single or multi-deck work platforms;
- (b) the rated load;
- (c) any impact load;
- (d) any dynamic load;
- (e) stress concentration factors;
- (f) corrosion;
- (g) metal fatigue; and
- (h) galvanic action.

(4) The minimum design floor load for a conveyance carrying persons shall not be less than 2,000 kg/m<sup>2</sup> on all floor areas.

**11.48.** (1) No skip, bucket, rock loading pocket, rock dump pocket, shaft sinking service door, dump door or other device used in the shaft shall be equipped with doors, gates or chains that are closed by positive fluid pressure, where the system may open if the fluid pressure drops.

(2) In the event of a drop in fluid pressure, the doors, gates and chains referred to in subsection (1) shall

- (a) automatically close, if they are open when the fluid pressure drops; and
- (b) remain closed, if they are closed when the fluid pressure drops.

(3) Equipment used to directly discharge material into a skip shall operate in such a way that actuating power is required before any doors, gates or chains will open.

**11.49.** (1) Conveyances and buckets shall be equipped with devices for safely securing any equipment or supplies that are to be transported in the shaft.

(2) Where equipment or supplies are being transported in a shaft, they shall be loaded and secured so as to prevent them from shifting.

(3) Where equipment is slung underneath a conveyance or crosshead in a shaft, it shall be suspended in a manner to prevent its contact with any part of the shaft, its lining or its furnishing.

(4) When any material being transported in a shaft projects above the top of the conveyance, the projecting portion shall be securely fastened to the conveyance and not to the hoist rope.

#### Transporting Persons

**11.50.** Where a shaft exceeds 50 m in vertical depth a suitable conveyance shall be provided for the transport of persons in the shaft.

#### Cage and Skip Requirements

**11.51.** A cage that is used for the transport of persons in a shaft shall

- (a) where it is supported by a single rope or a single point of attachment, be equipped with safety catches except on a friction hoist system where safety catches shall not be required;
- (b) except on any side with a door, be enclosed by a steel sheet at least 3 mm thick or by material of equivalent strength;
- (c) be adequately ventilated;
- (d) have a hood made of steel plate, at least 5 mm thick or of material of equivalent strength;
- (e) have an internal height greater than 2.1 m;
- (f) have a vertical opening at the door greater than 1.8 m;
- (g) have an exit in the roof that can be opened from inside or outside the cage and through which a stretcher carrying a person can pass;**
- (g.1) where the cage is a multi-deck cage, have access between each level of the cage; and**
- (h) be of sufficient size to accommodate a stretcher and two stretcher attendants.

**11.52.** The doors on a cage used to transport persons in a shaft shall

- (a) be at least 1.5 m in height;
- (b) be mounted and arranged so that they cannot be opened outward from the cage;
- (c) be of solid construction except for a viewing window;
- (d) be arranged so that they can be closed whenever persons or materials, other than rolling stock, are being transported in the cage;
- (e) be installed so that there is only enough clearance at the floor to allow them to be readily opened and closed; and
- (f) be of adequate strength to withstand normal shock loads.

**11.53.** (1) Except when it is being used to transport workers for shaft inspection or maintenance purposes or unless it is being used in a justifiable emergency, a skip used to transport persons in a shaft shall

- (a) meet the requirements of paragraphs 11.51(a), (c), (d) and (h);
- (b) provide an enclosure for the persons being transported that is at least 1.5 m in height;
- (c) have a suitable and adequately fastened floor;
- (d) have a means for safe entry and egress; and

- (e) be constructed so as to prevent any part of the body of a person riding in it, or material being carried in it, from coming into contact with the shaft, its lining or its furnishing.

(2) The opening between the side of a shaft and the skip box over which a person must pass when entering or leaving the skip shall be closed off sufficiently to prevent a person from falling through the opening.

(3) A shaft signal pull cord shall be located in a convenient place for the skip tender relative to the position he or she has in the skip when persons are transported in the skip.

**11.54.** Where safety catches are installed on a cage or skip, they shall

- (a) be of a type and design approved by the chief inspector;
- (b) safely stop and hold a cage or skip carrying persons if the hoist rope or its attachment should fail; and
- (c) be subjected to, and successfully pass, free fall tests in accordance with section 11.55,
  - (i) before the cage or skip is first used for the transport of persons, and
  - (ii) before the cage or skip is used for the transport of persons after repairs to correct any defect or distortion of the safety catches and mechanisms.

#### Free Fall Tests

**11.55.** (1) The free fall tests required by section 11.54 shall consist of suddenly releasing the loaded and travelling conveyance in some suitable manner from the hoist rope attachments so that the safety catches have the opportunity to grip the guides and stop the conveyance.

(2) Where the safety catches do not act satisfactorily, a conveyance shall not be used for raising or lowering persons until the safety catches have been repaired and have successfully passed the free fall test.

(3) The free fall test required by section 11.54 and subsection 11.116(12) shall be performed under the following conditions:

- (a) the cage or skip shall carry a weight equal to the maximum permitted load of persons carried plus the weight of any material permitted to be carried at the same time;
- (b) the cage or skip shall travel at a speed equal to the normal hoisting speed when persons are being transported;
- (c) the guides on which the test is made shall be representative of those in the shaft.

(4) A free fall test shall be considered successful if

- (a) the cage or skip is decelerated within 10 m/s/s and 30 m/s/s;
- (b) there is no damage to the safety catch mechanism;
- (c) the safety catches engage the guides and remain continuously engaged during the deceleration; and
- (d) calculations show that the safety catches would stop the cage or skip when carrying its maximum permitted material load.

(5) The results of each free fall test shall be recorded in the hoisting machinery record book and shall be submitted to the chief inspector in a form approved by the chief inspector, within 14 days after the test is completed.

#### Chairs

**11.56.** (1) Chairs used for landing a conveyance shall be

- (a) arranged to fall clear and remain clear of the shaft compartment when the conveyance is lifted off the chair;

- (b) operable only from outside the conveyance; and
- (c) so arranged as not to distort the conveyance.

(2) Chairs fastened to shaft station posts shall be of a chain type.

(3) When chairs are used for the purpose of landing a conveyance at any point in a shaft or winze, except when hoisting in balance from that point, the chairs shall not be put into operation unless the proper chairing signal has been given to the hoist operator.

(4) Chairs shall not be used when passengers are being carried in a hoisting conveyance.

#### Work Platforms

**11.57.** The manager shall prepare a written procedure for the use of a single or multi-deck work platform in a shaft and shall notify the chief inspector, in writing, of the intention to put it into service for shaft sinking or maintenance work.

#### HOISTS

##### Hoists - Drum to Rope Ratio

**11.58.** The ratio of a hoist drum diameter to the rope diameter shall be equal to or greater than,

- (a) in the case of a drum hoist, 60 to 1 where the nominal rope diameter is 26 mm or less, and 80 to 1 where the nominal rope diameter is greater than 26 mm;
- (b) in the case of a hoist used for shaft sinking or for preliminary development work during shaft sinking, 48 to 1 where the nominal rope diameter is 26 mm or less, and 60 to 1 where the nominal rope diameter is greater than 26 mm; and
- (c) in the case of a friction hoist, 80 to 1 for stranded ropes and 100 to 1 for locked coil ropes.

##### Hoist Brakes

**11.59.** (1) No hoist shall be used in a shaft unless it has at least two sets of mechanical brakes to stop and hold the hoist drum.

(2) At least one set of mechanical brakes shall be designed and arranged to apply directly to the hoist drum.

(3) Each set of mechanical brakes shall

- (a) be capable of safely stopping and holding the drum when the conveyance is carrying its maximum permitted load;
- (b) be arranged so that it can be independently tested;
- (c) be arranged to apply normal braking effort before any linkage or brake piston reaches a limit of travel;
- (d) be equipped with a device to give positive indication of brake lining wear or slack linkage and prevent any movement of the hoist if predetermined limits are exceeded; and
- (e) be arranged to apply automatically when
  - (i) the safety circuit of the hoist is interrupted,
  - (ii) the pressure in the hydraulic or pneumatic brake actuating system drops below normal, or
  - (iii) there is a loss of power to the hoist.

**11.60.** The mechanical braking system of a hoist shall be arranged so that

- (a) the brake is applied by a control lever that is pulled, unless there is a common brake and power lever; and

- (b) where brake weights are installed to provide braking force, they can be readily tested to ensure freedom of movement.

**11.61.** Hoist brakes shall be designed and arranged to decelerate the conveyance at between 1.5 and 3.7 m/s/s when braking is initiated by an interrupted safety circuit and the hoist is

- (a) normally used for transporting persons; and
- (b) operating in the normal full speed zone in the shaft.

**11.62.** No hoist shall be equipped with a foot-operated brake.

#### Protective Circuit Required

**11.63.** (1) No hoist shall be used unless it has a safety circuit that, when interrupted, cuts off the power supply to the hoist, activates the brake setting mechanism and brings the hoist to a safe stop under any condition of permissible load and speed and at any location in the shaft or headframe.

- (2) The safety circuit operating voltage shall not exceed 250 volts.

**11.64.** The safety circuit of a hoist shall be interrupted automatically when

- (a) there is a failure of the power supply or a drop in voltage sufficient to affect the safe operation of the hoist;
- (b) there is an abnormal overload on the hoist motor;
- (c) there is a short circuit in the hoist electrical system;
- (d) a safety device prescribed by these regulations has operated; and
- (e) there is a short circuit in the hoist safety circuit or control system.

**11.65.** An emergency stop switch arranged to interrupt the safety circuit of a hoist shall be located within easy reach of the hoist operator and the switch shall be easily identified, readily operated by hand and shall not reset automatically.

**11.66.** A track limit switch shall be installed in each shaft compartment above the normal upper limit of travel and shall be so arranged and positioned that in the event of an overwind it will be operated directly by the conveyance to interrupt the hoist safety circuit and bring the hoist to a safe stop before any conveyance or rope attachments can reach any permanent obstruction in the shaft or headframe.

#### Overwind and Travel Protection

**11.67.** A hoist shall be equipped with a device to protect any conveyance against

- (a) overwinding and, except during shaft sinking operations, underwinding;
- (b) approaching a limit of travel at an excessive speed; and
- (c) travelling at speeds in excess of the normal safe operating speeds.

#### Operation of Safety Devices

**11.68.** The device required by section 11.67 shall

- (a) interrupt the hoist safety circuit when activated;
- (b) be driven directly by the hoist drum;
- (c) be protected against loss of motion;
- (d) prevent the paying out of excess rope during sinking operations; and
- (e) be set to bring the hoist to a safe stop before any conveyance or rope attachments can reach any permanent obstruction in the shaft or headframe.

#### Slack Rope Detection

**11.69.** Every hoist shall be equipped with a blocked or stuck conveyance detection device that, when activated, will interrupt the hoist safety circuit and prevent slack rope.

## Friction Hoist Safety Devices

- 11.70.** (1) Every friction hoist shall, in addition to the requirements of sections 11.67 and 11.68, be equipped with devices that are set to interrupt the hoist safety circuit where
- (a) abnormal slip occurs between the hoist drum and the hoist ropes;
  - (b) abnormal wear occurs on the rope treads or the permissible limit of tread wear has been reached;
  - (c) the position of the conveyance with the safety devices driven from the hoist drum are not synchronized;
  - (d) any conveyance approaches the collar at an excessive speed; and
  - (e) an abnormal swing or rising occurs in the loop of a balance rope.

(2) The device required for paragraph (1)(d) shall be installed in the shaft.

- 11.71.** (1) Every hoist shall have on the operator console
- (a) an ammeter within plain view of the hoist operator to indicate the hoist motor current;
  - (b) a device to audibly warn the hoist operator when a conveyance is at a point in the shaft where manual braking must be commenced, except where automatic retardation controls are installed at the limits of travel;
  - (c) a speed indicator;
  - (d) a manually operated back-out device to enable any conveyance to be removed from an overwound or underwound position; and
  - (e) a manually operated underwind and overwind bypass device
    - (i) that only allows the hoist to be operated at a slow speed, and
    - (ii) arranged so that it only allows travel beyond the first overwind protection device.

(2) The back-out device required by paragraph (1)(d) shall prevent the brakes from being released until sufficient torque is developed by the motor to ensure movement in the right direction.

## Hoist Controls

- 11.72.** Every hoist shall have
- (a) a master controller that has the brakes fully applied when the power control is in the neutral position; and
  - (b) the brakes arranged so that, after any interruption of the hoist safety circuit, power cannot be restored to the hoist unless the brakes are in the fully applied position with the power control in neutral position and the hoist drum stopped.

## Safety Devices Adjustment

- 11.73.** (1) Every safety and protective device or controller installed on a hoisting plant shall
- (a) be designed and installed so that the failure of the device will
    - (i) cause the hoisting plant to shut down if it is operating when the device fails, or
    - (ii) prevent the hoisting plant from operating, if it is not operating when the device fails;
  - (b) be designed and installed taking into account the operating conditions at its location;
  - (c) be tested to determine if any magnetic, radio frequencies or other form of energy can render the device inoperative; and
  - (d) only be adjusted and maintained by an authorized person.

(2) The details of any adjustment to a safety and protective device or controller installed on a hoisting plant installation shall be recorded in the hoisting machinery record book or the electrical hoisting equipment record book.

#### Indicators

**11.74.** A hoist shall be provided with depth indicators that continuously, accurately and clearly show the hoist operator the position

- (a) of a conveyance or single-deck or multi-deck work platform;
- (b) in an inclined shaft, of a change in gradient that requires a reduction in hoist speed;
- (c) at which the overwind, underwind and track limit devices are set to operate;
- (d) of any intermediate shaft obstruction;
- (e) of the limits of normal travel for the conveyance or the single-deck or multi-deck work platform; and
- (f) of any collar doors, dump doors and crosshead landing chairs.

#### Persons in Skip

**11.75.** (1) Where a skip or bucket is being used to carry persons, the hoist shall be equipped with control devices that prevent the skip or bucket from

- (a) being taken to the dump and to the loading positions, unless the controls for loading the skip or bucket with ore or waste have been locked out in accordance with section 10.21; and
- (b) travelling at a speed in excess of 5 m/s.

(2) An audible or visible signal that the control devices described in paragraph (1)(a) are engaged shall be given to persons entering a skip or bucket.

#### Drum Requirements

**11.76.** No drum hoist shall have

- (a) more than three layers of rope where the drum has helical or spiral grooving or does not have grooving;
- (b) more than four layers of rope if the drum has parallel and half pitch grooving; and
- (c) less than three dead turns of rope remaining on the drum when the conveyance, counterweight, bucket or single or multi-deck work platform is at its lowest possible position in the shaft.

**11.77.** A drum on a hoist shall be provided with

- (a) grooves that properly fit the rope in use, except that a smooth drum may be used during shaft sinking operations and concurrent preliminary development work; and
- (b) flanges of sufficient height to contain all of the rope on the drum and of sufficient strength to withstand any loads imposed by the rope.

**11.78.** A drum hoist and a sheave shall be arranged so that the rope coils properly across the face of the drum and winds smoothly from one layer to another without cutting into the rope layer beneath.

**11.79.** (1) A clutch of a drum hoist shall be interlocked with the brake so that

- (a) the clutch can be disengaged only when the brake of the clutched drum is fully applied and the hoist drum is fully stopped; and
- (b) the clutch is fully engaged before the brake of the clutched drum can be released.

(2) The controls for engaging and disengaging a clutch shall be designed or equipped with guards to prevent their inadvertent operation.



(3) A band type friction clutch shall not be used.

## COMMUNICATION AND SIGNALLING

### Cage Call System

**11.80.** A cage call system shall be installed so that the signals are inaudible to the hoist operator.

### Hoist Signalling System

**11.81.** A hoist signalling system shall be installed at every shaft to permit the person in charge of the conveyance and the hoist operator to exchange hoist movement control signals.

**11.82.** (1) The signalling system required by sections 11.80 and 11.81 shall be supplied with power at a potential not exceeding 150 V from a transformer that does not supply any other equipment.

(2) Where the primary voltage of the transformer exceeds 750 V,

- (a) one conductor of the power supply shall be grounded and a device that will indicate a ground fault shall be installed; or
- (b) if the conductors are ungrounded, an isolating transformer with a one-to-one ratio shall supply power for the signalling system and a device that will indicate a ground fault shall be installed.

(3) All metal parts of the signalling system that do not carry electrical current shall be grounded.

**11.83.** The hoist signalling system shall

- (a) enable clear, audible signals to be given that are separate and distinct for each shaft compartment;
- (b) be arranged so that the hoist operator can return a signal to the person giving the signal; and
- (c) be installed throughout the shaft at each working level and landing deck and at other necessary locations.

**11.84.** A hoist signalling system installed on a single or multi-deck work platform shall be capable of providing a signal that is both audible and visible.

**11.85.** (1) A hoist signalling system using radio frequencies shall

- (a) be tested to determine if there is any hazard with respect to the use of blasting caps in the mine;
- (b) only be operated if precautions are taken to prevent the risk of an inadvertent or accidental detonation of any explosive material as a result of radiated energy;
- (c) only be operated if it works for the full length of the shaft and the radio frequency is reserved for exclusive use between the hoist operator and person in charge of the conveyance; and
- (d) meet the requirements of paragraphs 11.83(a) and (b).

(2) No device for signalling to or communicating with the hoist operator shall be installed or operated in or on any conveyance without the written permission of the chief inspector.

**11.86.** (1) Only authorized persons shall give any hoisting signal other than the danger signal.

(2) Except during maintenance, shaft sinking or preliminary development work or when a conveyance is recalled after a bell release, no person shall give any hoisting signal unless the conveyance is located at the level from which the signal is being given.

(3) No person shall interfere in any way with the hoisting signalling system.

**11.87.** (1) A hoist shall not be moved on manual control

- (a) unless the signal prescribed in section 11.88 has been given and returned by the hoist operator;
- (b) unless at least five seconds have elapsed after the executive signal has been given; and
- (c) if the hoist operator is unable to act within 30 seconds of receiving the executive signal, the hoist operator shall wait until a complete set of signals have again been received.

(2) Hoisting signals shall be given in the following sequence:

- (a) cautionary;
- (b) destination;
- (c) executive.

#### Mine Hoisting Code of Signals

**11.88.** (1) The code of signals set out in subsection (2) shall be used at a mine and a copy of the code shall be posted in each hoist room, at the collar and at each working level or other landing in the shaft.

(2) The code of signals shall be:

1 bell	Stop immediately -- if in motion
1 bell	Hoist
2 bells	Lower
3 bells	Person about to enter or leave the conveyance
3 bells	Given by the hoist operator when the conveyance has come to a stop to indicate to the cage tender that the conveyance will not be moved until a further signal is received. The cage tender shall not open the conveyance door until he or she has received the 3-bell signal and, where a return bell signal system is installed, the cage tender shall return the 3-bell signal before persons are permitted to leave the conveyance.

(3) The following signals are special signals used for special hoisting movements:

- 3 bells pause 3 bells pause 1 bell - hoist slowly
- 3 bells pause 3 bells pause 2 bells - lower slowly
- 4 bells followed by station signal - blasting; the hoist operator shall answer by returning the signal and raising the conveyance a few feet and lowering it to the original position
- 5 bells - release cage
- 9 bells - followed by station signal - **DANGER SIGNAL** - to be used only in case of fire or other emergency.

#### Special Hoisting Signals

**11.89.** (1) At every mine destination signals must be used to designate all regular stopping points.

(2) Special signals must be used to designate all special hoisting movements.

(3) All destination signals and special signals must be easily distinguishable from the code of signals set out in subsections 11.88(2) and (3), must not interfere with it in any way and must be accepted by the chief inspector.

(4) All destination signals and special signals in use at a mine and an adequate description of their application shall be posted at every hoist room and at every level or other recognized landing place in every working shaft or winze.

#### Voice Communications

**11.90.** A wired voice communications system shall be installed and maintained to permit clear communication between persons at the hoist room, the collar and the landing stations.

#### HOISTING PROCEDURES

##### Transport of Persons

**11.91.** (1) No person shall travel or be permitted to travel in a cage except during shaft inspection unless the doors of the cage are securely closed.

- (2) The door of a cage shall not be opened until
- (a) the conveyance has come to a full stop at the station; and
  - (b) where the hoist is operating under manual control, a three-bell signal has been received from the hoist operator.

(3) In the case of an inadvertent stop at any point in the shaft or winze, other than a station, the cage doors may be opened and the passengers may leave the cage on instructions to do so by the supervisor or a person so authorized by the manager.

**11.92.** (1) No persons shall be transported in a single compartment conveyance that is simultaneously being used to transport ore or other material, whether or not contained in rolling stock.

(2) Persons may be carried on the top deck of a multi-compartment conveyance with the doors closed where

- (a) the materials and rolling stock are loaded on a lower deck and are adequately secured;
- (b) the combined load does not exceed 85% of the material load limit of the cage; and
- (c) the trip is not primarily intended for the movement of persons at the beginning or end of a shift.

**11.93.** No person shall be allowed to travel in a conveyance where personal hand tools or equipment are being transported unless

- (a) the tools and equipment are, if necessary, adequately secured and protected by guards;
- (b) the combined load does not exceed 85% of the material load limit of the conveyance; and
- (c) the tools and equipment are placed so that they will not cause danger or discomfort to a person in the conveyance in the event of an emergency stop.

**11.94.** No person shall travel in a conveyance that is carrying explosives unless

- (a) the person is required to handle the explosives and there is adequate room remaining in the conveyance for the person to travel safely; and
- (b) the combined load does not exceed 85% of the material load limit of the conveyance.

## Authorized Person in Charge

**11.95.** (1) There shall be an authorized person in charge of the conveyance, skip or sinking bucket at all times the equipment is in use.

- (2) The authorized person in charge of the conveyance shall
- (a) maintain discipline when persons are riding in the conveyance;
  - (b) enforce the specified load restrictions for the conveyance; and
  - (c) notify the hoist operator if a heavy or an irregularly shaped load is being handled.

(3) No person shall obstruct the authorized person from performing his or her duties.

(4) Where persons are underground in an area of a mine served by a hoist, the person in charge of the conveyance shall, when not riding in the conveyance, be available within close proximity of the shaft to hear the sound of the cage call or hoisting signals in case of an emergency.

(5) A person being transported in a conveyance shall maintain appropriate conduct and shall be prepared for an emergency stop.

(6) No person shall smoke while in a shaft conveyance.

**11.96.** A notice clearly showing the load restrictions for the weight of material and number of persons to be carried in each conveyance shall be posted at the collar and all entrances to the shaft.

## Hoisting Suspended During Shaft Work

**11.97.** (1) Except during shaft sinking operations and concurrent preliminary development work, no hoisting operations shall be conducted simultaneously with any other work in a shaft compartment or in that part of the headframe used in conjunction with the shaft compartment.

(2) Where shaft sinking operations and concurrent preliminary development work are to be performed, the shift boss or supervisor shall warn the hoist operator on duty and make a signed entry in the hoist operator's log-book.

(3) Before the commencement of work or of an examination below a loading pocket in a shaft, an authorized person shall inspect the feed chute and the loading pocket gates to ensure that they are locked out in the closed position and that the work or examination can proceed safely.

(4) Where work or an examination is taking place in a shaft compartment or in the part of the headframe used in conjunction with the compartment, the power supply to all conveyor belts, gates and other devices that are located above a person and that could cause material to flow into the shaft shall be locked out in accordance with **section 10.21** and the gates shall be mechanically secured in the closed position.

## Shaft Examination

**11.98.** (1) No person shall enter a hoisting compartment of a shaft in which hoisting operations are being conducted, except to enter or exit a conveyance in the compartment.

- (2) No person shall work in a shaft compartment or in a place immediately adjoining the compartment or in that part of the headframe used in conjunction with the compartment while hoisting operations are being carried on in the compartment, except where
- (a) the conveyance is necessary for carrying out the work and it has been equipped with a suitable working platform and overhead protection device;

- (b) the person is engaged in filling skips at a loading station and is properly protected in a location having sufficient room size for the person to safely carry out his or her duties;
- (c) the person is adequately protected from accidental contact with a moving conveyance and from the danger of falling material or rock; and
- (d) the work is being performed in a separate compartment that meets the requirements of section 11.04.

#### Hoisting - Automatic Controls

**11.99.** (1) Where a hoist is being operated by automatic or semi-automatic control and no other means are available for getting persons out of the mine quickly, an authorized hoist operator shall be readily available to operate the hoist when workers are underground.

(2) A device that permits a switch from manual to automatic control shall be installed on an automatic hoist and the device shall be so located that it is readily accessible to a person operating the manual controls.

(3) The device referred to in subsection (2) shall only be operated by an authorized person.

(4) Where an automatic hoist

- (a) has been operated on manual control and is switched to automatic control, or
- (b) has been on automatic control but has not been operated for two hours or more,

no person shall be raised or lowered in a conveyance until the conveyance has made one complete trip up and down the working portion of the shaft under the supervision of a hoist operator, and the trip has been recorded in the hoist operator's log-book.

(5) Where the hoist safety circuit is interrupted or an emergency stop occurs during automatic or semi-automatic hoisting operations, the hoist shall only be operated on manual control until

- (a) the reason for the interruption or stop has been determined;
- (b) the fault has been corrected; and
- (c) sufficient hoisting cycles have been completed to ensure that the system is operating normally.

#### Location of Cage Hoist Controls

**11.100.** (1) Where a hoist is designed to be operated automatically from controls located at shaft stations and inside the cage, the switch for effecting a changeover of the control made between the shaft station and the cage shall be effective only at the shaft station where the cage is stopped.

(2) Devices installed at shaft stations for selecting the cage destination and initiating hoist movement shall be effective only when the cage is stopped at that station.

(3) Except for jogging movements, a control located at a shaft station for initiating hoist movement shall be effective only when the shaft gate is closed.

(4) When an executive signal is given from a control at a shaft station, at least five seconds shall elapse before the hoist moves.

(5) Except for jogging movements, devices located inside a cage for initiating hoist movements shall be effective only when the doors of the cage and the shaft gates are closed.

(6) Where a control for initiating hoist movement is located inside a cage, a device shall be installed in the cage which can cause the hoist safety circuit to be interrupted in an emergency

## Hoist Operator's Duties

- 11.101.** (1) A hoist operator shall,
- (a) at the start of the shift before raising or lowering a conveyance**
    - (i) read and countersign the log-book from the previous shift,**
    - (ii) independently test each brake in both the up and down directions against the normal full load starting power of the hoist to ensure that each brake is in a satisfactory working condition, and**
    - (iii) where the hoist is equipped with a friction clutch, test the holding power of the clutch; and**
  - (b) at least once in each 24 hour period of hoist operation, test the overwind and underwind protective devices by slowly raising or lowering the conveyance into the devices.**

(2) The hoist operator shall record the results of the tests made pursuant to subsection (1) in the hoist operator's log-book.

- 11.102.** (1) A hoist operator shall make a trial return trip of the conveyance
- (a) through the working part of the shaft after any stoppage of hoisting for more than two hours; and
  - (b) below any part of a shaft that has been under repair, after the repairs have been completed.

(2) The stoppage or repair and trial return trip referred to in subsection (1) shall be recorded in the hoist operator's log-book by the hoist operator.

- 11.103.** A hoist operator shall
- (a) not operate a hoist if it is unsafe to do so;
  - (b) remain at the hoist controls at all times that the hoist is in motion under manual control;
  - (c) not talk with anyone while the hoist is in operation under manual control, except in an emergency or during shaft inspection or hoist maintenance work;
  - (d) not operate the hoist to transport any person unless at least two brakes can be applied to safely stop the conveyance;
  - (e) not unclutch a drum until the brake test referred to in section 11.101 has been successfully completed;
  - (f) not lower anything on an unclutched drum;
  - (g) not leave the hoist controls, except when the hoist is put on automatic control, until the brakes and the controls have been set so that at least two separate and distinct actions are required to put the hoist in motion;
  - (h) where heavy or irregular loads are being hoisted or lowered, follow the procedure established for such loads; and
  - (i) where a hoist is equipped with an auxiliary overwind device for preventing persons from being hoisted to the dumping position in a skip, a cage or skip-cage assembly, place the auxiliary overwind device in operation or assure himself or herself that such device is in operation at all times that persons are being carried.

## Signals to Hoist Operators

- 11.104.** (1) A hoist operator shall complete any hoist movement required by an executive signal without stopping unless he or she receives a "stop" signal or unless an emergency occurs.

(2) After receiving a three-bell signal, a hoist operator shall remain at the hoist controls unless advised orally by the person in charge of the conveyance that hoist movement will not be required.

(3) When the conveyance arrives at a station, the hoist operator shall give a three-bell signal that must be returned by the person in charge of the conveyance before passengers are permitted to leave the conveyance, except where a locked bell system approved by the chief inspector is used.

**11.105.** A hoist operator shall not be required to attend to any other machinery except with the approval of the chief inspector.

#### Prohibitions

**11.106.** (1) No person other than an authorized person shall operate or interfere with any devices or controls for operating a hoist.

(2) No person shall speak to the hoist operator while the hoist is operating under manual control, except in an emergency or during shaft inspection or hoist maintenance work.

(3) No person shall be in or on a cage while it is being placed onto or removed from chairs.

(4) No person shall be in, on or under a conveyance that is supported by an unclutched drum unless the conveyance is secured in position or unless permitted by paragraph 11.15(a).

(5) No person shall leave a conveyance that has inadvertently stopped at a point other than a shaft station, except upon instruction from an authorized person outside the conveyance.

#### Objects Falling Down Shaft

**11.107.** (1) Where an object that may be a hazard to the operation of a conveyance has fallen down the shaft, normal hoisting operations shall be suspended until

- (a) a shaft inspection has been conducted by an authorized person and a trial run has been made through the affected part of the shaft;
- (b) any obstructions have been removed; and
- (c) any damage affecting safe operation has been repaired.

(2) Details of the inspection, fallen object and trial run shall be recorded in the hoist operator's log-book by the hoist operator.

#### Hoisting Procedures

**11.108.** (1) The manager shall establish procedures for safe hoisting operations that include instructions for

- (a) operating the hoist where there is an intermediate shaft obstruction;
- (b) emergency procedures;
- (c) commencing hoisting operations after an inadvertent stoppage of the hoist;
- (d) removing persons from a conveyance that has inadvertently stopped at a place in the shaft other than a shaft station;
- (e) the operation of any safety devices; and
- (f) the hoisting or lowering of heavy or irregular loads.

(2) The manager shall ensure that a copy of the procedures and the training program for safe hoisting operations is submitted to the chief inspector and to the Committee.

(3) Each hoist operator and person in charge of the conveyance shall be instructed in the procedures.

(4) No person shall operate, inspect, service or maintain or be permitted to perform any function on any hoist after consuming or being exposed to any drug, alcohol, fume or any other substance that could impair the person's ability to operate, inspect, service or maintain the hoist safely.

**11.109.** (1) A hoist operator shall not move the conveyance until he or she has received a proper signal.

(2) In the event of an inadvertent stop at some point in the shaft or winze other than a station from which signals may be given, the hoist operator may move the conveyance if he or she has assured himself or herself that the hoist controls are in proper working order and he or she has received instruction from an authorized person.

**11.110.** (1) Where the normal air in the hoist room could become contaminated, a procedure shall be established by the manager for the supply of uncontaminated air to the hoist operator and cagetender by means acceptable to the chief inspector.

(2) A copy of the procedure required by subsection (1) or extracts from that procedure shall be kept posted in a conspicuous place or places where the procedure is most likely to come to the attention of persons who could be affected by the procedure.

## RECORDS

### Hoisting Plant Log-Books

**11.111.** (1) In addition to the requirements of section 10.09, the following permanently bound log-books with numbered pages shall be provided by the manager:

- (a) electrical hoisting equipment record book for each hoist;
- (b) hoisting machinery record book for each hoist;
- (c) hoist operator's log-book for each hoist;
- (d) rope record book;
- (e) shaft inspection record book.

(2) The log-books referred to in subsection (1) shall be

- (a) kept in the hoist room;
- (b) maintained in good clear reproducible order; and
- (c) made available to an inspector when he or she so requests.

**11.112.** A hoist operator shall, without delay, after testing or the occurrence of an incident involving the hoist, report in the hoist operator's log-book

- (a) the working condition of the hoist brakes, clutches, clutch-brake interlocks, depth indicators, hoist controls, signalling systems, overwind and underwind devices and any other devices that may affect the safe operation of the hoist;
- (b) any special instructions received affecting the normal operation of the hoist;
- (c) any abnormal circumstances in connection with the operation of the hoist or attachments to the hoist;
- (d) the results of any tests or trial trips made in compliance with these regulations;
- (e) a report of any inadvertent stoppages that occurred; and
- (f) a report of any questionable signals received by the hoist operator.

**11.113.** A hoist operator shall

- (a) before commencing to operate the hoist, review and countersign all entries in the hoist operator's log-book for the preceding 24 hours;
- (b) enter in the log-book the time at which the shift commenced and finished; and
- (c) sign all entries made during the shift.

**11.114.** (1) Every person issuing instructions to a hoist operator shall record and sign such instructions in the hoist operator's log-book.



(2) Each working day, the supervisor in charge of a hoist shall review and countersign all entries made in the hoist operator's log-book during the preceding 24-hour work period.

#### Hoist Examination

**11.115.** (1) An examination for defects shall be made by a qualified person, using non-destructive test methods approved by the chief inspector, to determine the condition of the

- (a) mine hoist drums, shafting, brake pins and linkages;
- (b) rope sheave wheels, shafting and bearings; and
- (c) conveyance structural parts, attachment pins, drawbars, hoist rope and tail rope attachments.

(2) The examination referred to in subsection (1) shall be made

- (a) before parts are first used or reinstalled, and subsequently at regular intervals that do not exceed 12 months; or
- (b) as required by the chief inspector.

(3) Drawings of the parts to be examined under subsection (1) shall be made available, upon request, to the person performing the examination.

(4) A record of every examination required by this section and any servicing and repairs shall be entered in the hoisting machinery record book and the entries in the record book shall be dated and signed by the person performing the examination, servicing or repairs.

(5) A copy of the results of every examination shall be sent to the chief inspector within 14 days after the test required by subsection (1).

#### Routine Inspections

**11.116.** (1) The manager shall ensure that the inspections required by this section are performed within the specified time periods.

(2) At least once in each production day an inspection shall be made of

- (a) the exterior of each hoist rope and tail rope
  - (i) to detect the presence of kinks, locked swivels or other visible defects, and
  - (ii) to note the condition of the rope dressing;
- (b) the conveyance safety catches for any visible damage or defects; and
- (c) the hoist's braking system to ensure the operating weights or springs, where these are used, are moving freely.

(3) At least once in each week an inspection shall be made of

- (a) conveyance safety mechanisms to ensure proper adjustment, freedom of movement and freedom from damage;
- (b) head, deflection and idler sheaves including their shafts, bearings and sole plate areas;
- (c) rope attachments, conveyance attachments and suspension gear;
- (d) conveyances, buckets and work platforms;
- (e) parts of the hoist that could affect normal operation including the brakes, clutches, interlocks, depth indicators and all safety devices;
- (f) hoist and shaft equipment being used during shaft sinking operations;
- (g) brake operating weights or spring systems to ensure that they move freely and have adequate holding capacity;
- (h) loading pockets and unloading facilities;
- (i) parts of a friction hoist drum and deflector sheave rope treads to ensure that
  - (i) the rope tread is in good condition, and

- (ii) all rope tread diameters on the hoist drum are within a workable tolerance for the set of ropes as determined by the "collar to collar" test or other test method acceptable to the chief inspector;
  - (j) guide and rubbing rope attachment and tensioning devices;
  - (k) hoist motors and motor generator sets;
  - (l) hoist control systems;
  - (m) electrical safety devices;
  - (n) signalling systems; and
  - (o) shaft furnishings in the shaft and headframe compartment.
- (4) At least once in each month an inspection shall be made of
- (a) hoist ropes, balance ropes, guide ropes and rubbing ropes to ascertain the deterioration of such rope;
  - (b) that portion of the hoist rope that normally remains on the hoist drum when the conveyance is at its lowest stopping point in the shaft;
  - (c) the main components of the hoisting plant;
  - (d) the headframe and shaft furnishings, shaft linings, walls, guides, ladderways, loading pockets and unloading facilities; and
  - (e) the shaft sump to ensure that the tail rope loop, guide and rubbing rope connections and weights are clear of water and spillage.
- (5) At least once in each month an inspection shall be made of the friction hoist ropes
- (a) to measure and record on a graph the stretch of the hoist ropes and record the results in the hoisting machinery record book;
  - (b) to adjust, if necessary, the design torque balance of each hoist rope, maintaining equal tension in each of the ropes in a multi-head rope installation; and
  - (c) to inspect the balance rope swivel connections.
- (6) For the purpose of the inspection required by paragraph (4)(a), the rope shall be cleaned at points selected by an authorized person who shall measure and record in the hoisting machinery record book the
- (a) diameter or circumference of the rope and the location;
  - (b) lay length of the rope at that location; and
  - (c) number and location of any broken wires, corrosion, distortion or structural failure of the rope.
- (7) Where during the inspection of the rope required by paragraph (4)(b), significant deterioration is found in that portion of rope on the drum or at the crossover points, the rope shall be shortened sufficiently to eliminate any crushed portion or to change the position of the crossover points if either or both are necessary.
- (8) The starting point of the inspection required by subsection (4) shall be changed slightly from month to month in order to obtain more complete information of the rope, but any part showing a reduction in diameter or circumference or having any broken wires, corrosion, distortion or other structural damage shall be rechecked when the rope is again inspected.
- (9) At least once in each month, and more often if necessary to maintain the coating in good condition, a shaft rope, including that portion of a hoist rope that normally remains on the hoist drum when the conveyance is at its lowest stopping point in the shaft, shall be dressed or lubricated and
- (a) the rope dressing or lubricant used on a hoist rope, balance rope, guide and rubbing rope shall be suited to the operating conditions of the rope; and
  - (b) a report of all dressing and lubrication shall be recorded in the hoisting machinery record book and signed by the person who performs the dressing and lubrication.
- (10) At least once in each six months period an inspection shall be made

- (a) of the connection between the rope and the conveyance and of the connection between the rope and the drum, and each connection shall be thoroughly cleaned and examined;
- (b) of a friction hoist installation,
  - (i) of the position of each hoist rope and balance rope within the clamps of the attachment, and this position shall be changed, and where this is not practical the attachment between the rope and the conveyance or counterweight shall be dismantled, thoroughly cleaned and the rope examined and the attachment shall not be reassembled unless the rope is in satisfactory condition, and
  - (ii) of the rope treads which shall be measured and of the control and safety devices which shall be recalibrated in accordance with any reduction in tread diameter; and
- (c) of a guide and rubbing rope installation of the rope attachments and mechanical tensioning devices, which shall be thoroughly cleaned and examined and the rope shall be turned through a suitable angle to equalize the wear around the rope.

**(11) At least once in each three month period the safety catches and mechanisms of a shaft conveyance shall in a manner that is suitable, be tested by the sudden release from rest of the empty shaft conveyance in order to allow the safety catches to grip the guides and stop the conveyance.**

**(12) Where the safety catches and mechanisms of a shaft conveyance do not act satisfactorily during a test, the shaft conveyance shall not be used for lowering or raising persons until the safety catches and mechanisms are repaired, retested, and shown to act satisfactorily.**

(13) The date and the total distance dropped from rest by the conveyance in the drop test, and the length, width and depth of each chisel mark of the arrest gear in the guides, shall be recorded in the hoisting machinery record book, and the results shall be sent to the chief inspector within 14 days after the test is completed.

- (14) At least once in each 12 month period an inspection shall be made of
  - (a) all hoisting plant foundation bolts, equipment bolt locking devices and other bolts and fastenings that are critical for the safety of the hoisting plant;
  - (b) the bails, suspension gear and structural components of each conveyance in service;
  - (c) the headframe foundations and main structural members of the headframe structure, back-legs, sheave deck, unloading facilities and bin support structures;
  - (d) the main structural components of the shaft, shaft furnishings and loading pocket support structure;
  - (e) the water in the shaft sump to determine the pH value; and
  - (f) the main hoisting plant components as required by section 11.115.
- (15) At least once in each five year period an inspection shall be made of
  - (a) the rope clamping mechanism on a guide and rubbing rope installation, by lifting the rope through a minimum distance of 1.5 times the headframe capping length, and the rope shall be recapped; and
  - (b) a conveyance to ensure that it continues to meet the requirements of section 11.46.

#### Records of Inspections

**11.117.** (1) A record of all inspections and examinations conducted in compliance with these regulations and a record of all repairs and maintenance work performed on the hoisting plant equipment and shaft, shall be entered in the

- (a) hoisting machinery record book for the mechanical work;
- (b) electrical hoisting equipment record book for electrical work; and

(c) shaft inspection record book for shaft work.

(2) All entries shall be dated and signed by the person who performed the work, and that person's supervisor shall countersign each entry made in the record book with respect to the examinations and inspections conducted in compliance with these regulations.

#### Reporting Defects

**11.118.** Where, during normal operation or any examination or test required to be conducted by these regulations, a weakness or defect is discovered that could endanger the safety of any person using the hoisting plant, the matter shall be reported without delay to the supervisor in charge of the hoisting plant and the Committee and the hoisting equipment shall not be operated until the necessary remedial action has been taken.

#### Record of Equipment Failures

**11.119.** A record of any failure or incident involving any part or component of the headframe, shaft or hoisting equipment shall be recorded in the

- (a) hoisting machinery record book by the supervisor responsible for the mechanical integrity of the hoisting plant;
- (b) electrical hoisting equipment record book by the supervisor responsible for the electrical integrity of the hoisting plant; and
- (c) shaft inspection record book by the supervisor responsible for the structural integrity of the shaft, headframe and hoist room.

#### Supervisor's Responsibilities

**11.120.** The supervisor in overall charge of the hoisting plant equipment shall

- (a) at least once in each week, review the entries made during the preceding week in the hoisting machinery record book, electrical hoisting equipment record book, hoist operator's log-book and shaft inspection record book;
- (b) ensure that all examinations and tests required by these regulations have been conducted and that any necessary repairs or adjustments that were required were made; and
- (c) upon completion of the review, certify by signing in each record book and log-book that he or she has complied with subsections (a) and (b).

## PART XII

### FIRE PROTECTION

#### Fire Risk Assessment

**12.01.** (1) The manager shall ensure that a fire risk assessment is carried out not later than March 31 in each calendar year for all parts of the mine, both underground and surface, and the assessment shall

- (a) identify the potential for a fire or explosion by examining
  - (i) ignition sources, such as internal combustion engines, malfunctioning equipment, welding and burning and electrical equipment,
  - (ii) fuel sources such as combustible materials including class A ordinary combustibles and class B flammable and combustible liquids, and
  - (iii) the proximity of ignition sources to fuel sources, damaged equipment and accumulations of combustible materials;
- (b) determine if persons may be exposed to the effect of fire;
- (c) identify the need for fire protection and the type of fire protection that should be provided; and
- (d) set out measures to be taken to reduce the hazard from fire, including
  - (i) equipment design,

- (ii) adequate maintenance of equipment,
- (iii) proper training,
- (iv) evacuation procedures,
- (v) use of detection and early fire warning devices,
- (vi) type of fire suppression equipment, and
- (vii) means of egress from a worksite.

- (2) The manager shall ensure that
  - (a) a complete audit is made of the fire risk assessment at least annually by a qualified person; and
  - (b) the results of the fire risk assessment are entered in the log-book kept for that purpose and are made available to an inspector and to the Committee.

#### Emergency Procedures

- 12.02.** (1) The manager shall develop emergency procedures
- (a) designed to reduce the risk of fire at a mine; and
  - (b) that specify measures to be taken to reduce risks to personal safety that may arise in the event of a fire.

- (2) The emergency procedures shall be discussed with the Committee.

- (3) All persons at the mine who may be affected by the emergency procedures shall
  - (a) be adequately instructed with respect to the procedures; and
  - (b) provide the manager with a written notice indicating that they have read and understand the emergency procedures.

(4) A copy of the emergency procedures shall be posted in a conspicuous place on the surface and underground.

- (5) A copy of the emergency procedures shall be sent to the chief inspector.

#### Fire Fighting Training

**12.03.** (1) The manager shall ensure that the following training in fire fighting is carried out under the direction of a qualified person:

- (a) all persons newly employed at a mine shall be given instruction in the use of fire fighting equipment during the first week of employment;
- (b) all persons regularly employed underground shall receive a refresher course in the use of fire fighting equipment at intervals not exceeding 12 months;
- (c) the manager shall ensure that a suitable number of employees are trained in fire fighting techniques and those employees shall attend at least 20 hours of training in each 12 month period.

(2) The qualified person appointed by the manager to carry out the training required under subsection (1) shall record all drills and practices and the name of each person in attendance.

#### Fuel Storage Areas

**12.04.** (1) The manager shall ensure that all underground garages, oil and grease storage areas and fuelling stations

- (a) are designed and protected to prevent the inadvertent entry of an uncontrolled vehicle;
- (b) have safe means of entry and egress appropriate for the conditions and purpose of the enclosure;
- (c) are adequately ventilated to suit the purpose of the enclosure;

- (d) are located so that a fire or explosion inside the facility would have minimal effect on other working areas of the mine and on underground installations;
- (e) where required by an inspector, in garages where oil, grease, or flammable material is stored, are equipped with an automatically activated fire suppression system that**
  - (i) has been properly designed and installed to provide effective fire control, and**
  - (ii) incorporates fire doors having at least a two hour fire rating;**
- (f) are provided with means for manually activating the fire suppression system from several locations inside the enclosure and at least one location outside the entrance;
- (g) have a concrete floor without service pits;
- (h) are equipped with means for containing spills of petroleum products that include suitable use of fireproof receptacles into which the spilled petroleum products shall be deposited for removal from the mine without delay;
- (i) have adequate clearances for the safe performance of all work;**
- (j) are only equipped with electrical equipment that complies with the requirements of section 18 of CSA Standard C22.1-94, Canadian Electrical Code, Part I and;**
- (k) are equipped with carbon monoxide alarm devices.**

(2) When the fire suppression system is activated, an alarm shall be given automatically at suitable, staffed locations on the surface of the mine and underground, or at a central fire control station at the mine.

#### Storage of Combustible or Flammable Material

- 12.05.** (1) The manager shall ensure that
- (a) all combustible liquids, flammable liquids and petroleum products stored underground are stored in suitable enclosed containers placed in an oil storage area;
  - (b) no more than seven days' supply of combustible liquid or petroleum products is stored at any time underground;
  - (c) no more than one day's supply of flammable liquid is stored at any time underground; and
  - (d) an underground combustible liquid, flammable liquid or petroleum products storage area is separate from a service garage.

(2) The manager shall apply to the chief inspector for a permit where it is proposed to store more than 1000 l of a combustible liquid or a petroleum product in a storage area.

(3) An application under subsection (1) shall contain details of the location of the storage area and specifications of its construction.

#### Underground Fuelling Stations

**12.06.** The manager shall notify the chief inspector, in writing, of the intended construction of an underground fuelling station.

**12.07.** No smoking or open flame shall be allowed in or near a fuelling station and signs to this effect shall be posted in conspicuous locations.

- 12.08.** A fuelling station shall
- (a) be separate from a service garage;
  - (b) incorporate a non-combustible sill curb or dike of sufficient height to contain a spill or leak of liquid; and
  - (c) be totally enclosed and equipped with a self-closing door having at least a two hour fire rating.

**12.09.** (1) Where a mobile fuelling supply tank is used, the tank shall be clearly labelled with "No Smoking" signs.

(2) No person shall smoke, perform hot work or have an open flame within 20 m of a mobile fuelling supply tank.

**12.10.** Where practicable, vehicles shall only be fuelled at recognized fuelling stations.

#### Warning Signs

**12.11.** The manager shall ensure that suitable warning signs identify all fire hazard areas, including

- (a) fuel storage areas;
- (b) explosives storage areas;
- (c) timber storage areas; and
- (d) fuelling areas.

**12.12.** (1) The manager shall make suitable arrangements to ensure that no person builds or lights a fire underground.

(2) Subsection (1) does not apply to the use of welding or cutting equipment.

#### Fire Doors

**12.13.** (1) The manager shall ensure that there is a sufficient number of fire doors to

- (a) isolate the workings of the mine from a shaft or adit; and
- (b) isolate each shaft or adit from every other shaft or adit.

(2) Fire doors required by subsection (1) shall have at least a two hour fire rating and shall be

- (a) kept clear of obstructions so as to be readily usable at all times;
- (b) constructed and maintained so as to reduce leakage to a minimum;
- (c) installed so that they do not open inadvertently should the ventilation of the mine be reversed;
- (d) capable of being opened from both sides without requiring special knowledge of operating devices;
- (e) equipped with positive latching mechanisms; and
- (f) equipped with a self-closing mandoor where the fire doors are activated by mechanical means.

#### Fire Fighting Equipment

**12.14.** The manager shall ensure that fire fighting equipment

- (a) is provided and maintained in or near each headframe, portal house, shaft house, mineral processing plant, maintenance shop and other building at a mine; and
- (b) meets the requirements of the chief inspector.

**12.15.** (1) The manager shall ensure that fire fighting equipment is provided and maintained at all underground crusher stations, electrical installations, conveyor drives, pump stations, shaft stations, explosive storage areas, service garages and fuelling stations, stationary diesel engines and electric motors.

(2) The fire fighting equipment provided in accordance with subsection (1) shall be so located that its effective use will not, in the event of a fire, be hampered or prevented by the direction of the mine air flow at that location.

**12.16.** (1) The manager shall ensure that all fire fighting equipment provided at the mine is maintained by an authorized person.

(2) The manager shall ensure that all fire fighting equipment provided at the mine is inspected by an authorized person at least once each month and that the results of the inspection are entered in a log-book kept for that purpose.

(3) Each entry in the log-book required to be kept by subsection (2) shall be countersigned by the supervisor appointed to be in charge of the equipment, and he or she shall bring any concerns to the attention of the manager.

(4) The manager shall ensure that concerns brought to his or her attention under subsection (3) are dealt with as soon as is practicable.

#### Removal of Refuse

**12.17.** (1) The manager shall ensure that all combustible refuse underground or in or near a headframe or a fire hazard area designated by the manager, is removed at least weekly or more frequently if quantities exceed acceptable limits.

(2) Small items of combustible refuse shall be deposited in a covered fire proof container until removed in accordance with subsection (1).

(3) Each shift boss or mine captain shall certify, in writing, to the manager at least weekly that there is no accumulation of combustible refuse underground in the area under his or her supervision except as reported by him or her.

#### Emergency Warning System

**12.18.** (1) The manager of a mine shall provide an emergency warning system and procedures for the safe evacuation of the mine in the event of a fire, and the system shall be maintained ready for instant use for the purpose of warning all persons underground of an emergency.

(2) When the emergency warning system is activated, all persons shall follow the emergency procedures developed by the manager.

**(3) The manager shall, on a date and time approved by the management co-chairperson and the worker co-chairperson, test the procedures for the safe evacuation of the mine during a production shift at least once in each 12 months.**

**(3.1) Where the manager, the management co-chairperson and the worker co-chairperson are unable to agree on a date and time for the test referred to in subsection (3), the chief inspector shall determine the date and time of the test.**

(4) A report of the test of the procedures for the safe evacuation of the mine and of the effectiveness of the emergency warning system shall be

- (a) sent to the chief inspector; and
- (b) reviewed by the Committee.

(5) The chief inspector may require an amendment to the procedures for the safe evacuation of the mine where the test required by subsection (3) shows inadequacies in the procedures.

**12.19.** The manager shall ensure that surface operations at a mine accord with the requirements of the National Fire Code of Canada 1995 issued by the National Research Council of Canada.



PART XIII

ELECTRICAL POWER SYSTEM

- 13.01.** (1) The electrical system and electrical equipment at a mine shall be
- (a) designed in accordance with good engineering practice; and
  - (b) constructed in accordance with a design and plans that have been certified by a professional engineer.

(2) Except where otherwise required by these regulations, the electrical system and electrical equipment shall meet or exceed the requirements of CSA Standard **CAN/CSA-M421-93**, Use of Electricity in Mines.

(3) Where the electrical system **or electrical equipment** has been designed to a different standard than that required by subsection (2), the chief inspector may waive, in part, the requirements of subsection (2).

(4) Where the existing electrical system or electrical equipment is modified, the manager shall ensure that the modified system or equipment meets the requirements of subsection (2).

**13.02.** (1) Prior to the introduction of electrical energy at a mine site and **before a major alteration to an existing installation**, the manager shall submit an application to the chief inspector for permission to do so, and the electrical system shall not be energized until written permission has been obtained from the chief inspector.

(2) The application referred to in subsection (1) shall include a schematic drawing certified by a professional engineer

- (a) showing the areas and equipment where the electrical energy is to be transmitted and used; and
- (b) showing, where the electrical energy is to be used underground,
  - (i) the dimensions of the mine opening in which the supply cables will be installed,
  - (ii) the clearances around the electrical equipment in the distribution stations, and
  - (iii) the fire protection and ventilation systems in these areas.

**13.03. repealed**

**13.04.** The manager shall ensure that

- (a) the requirements of sections 10.04 and 10.13 to 10.15 are met in respect of all electrical systems and electrical equipment;
- (b) in addition to the requirements of sections 10.16 to 10.20, people are protected from energized electrical systems or electrical equipment and are provided with suitable lighting, safe footing and sufficient room if required to work near such systems and equipment; and

(There is no section '(c)' in the regulation)

- (d) in addition to the requirements of sections 10.21 to 10.23, the lock-out procedure is applied whenever a person services, repairs, or performs any other work on, or near, non-operating machinery, equipment or apparatus that could endanger a person if it should unexpectedly or accidentally be started up or energized.

**13.05.** The manager shall ensure that no electrical energy is introduced or used in an area that is or is potentially a hazardous location as defined in CSA Standard C22.1-94, Canadian Electrical Code, Part I, without the written permission of the chief inspector.

**13.06.** The manager shall ensure that all electrical systems and electrical equipment in use or that may be used in a hazardous location, are approved under CSA Standard C22.1-94,

Canadian Electrical Code, Part I, for use in such a location and for the specific hazard that is or may be present.

**13.07.** In addition to the requirements of sections 10.04 to 10.07, the manager shall

- (a) submit to the chief inspector the maintenance, inspection and testing procedure for all electrical equipment in a hazardous location; and
- (b) designate the persons authorized to make the inspections and to carry out the maintenance described in the procedures.

**13.08.** In addition to the requirements set out in sections 10.21 to 10.23, the repair, adjustment or replacement of electrical equipment shall only be carried out in a hazardous location where flammable gas could accumulate

- (a) after the equipment has been disconnected and locked out from the power supply and is electrically dead; and
- (b) in a location where the authorized person doing the work is satisfied that no dangerous concentration of flammable gas is present.

**13.09.** (1) Where electrically powered equipment is being operated at a place where flammable gas could accumulate in dangerous amounts, the manager shall ensure that an automatic gas detector of a type approved by the chief inspector is installed to continually monitor the air in the vicinity of the machinery and to give an audible or visual warning when a predetermined percentage of flammable gas is present.

(2) Where flammable gas could accumulate in dangerous amounts, the chief inspector may request that an automatic gas detector be installed to continually monitor the air and to give an audible or visual warning when a predetermined percentage of flammable gas is present.

**13.10.** (1) Switch gear that can isolate all underground electrical circuits shall be provided at the surface of a mine.

(2) Only an authorized person shall be permitted access to the switch gear.

(3) An authorized person shall be available to operate the switch gear when the circuits are energized.

**13.11.** (1) In addition to the requirements of sections 10.04 to 10.07, the manager shall ensure that procedures and protective equipment are in place for the handling of an energized trailing cable, and the person handling the cable shall follow the procedures and use the protective equipment.

(2) A trailing cable that is or may have been damaged shall be inspected by an authorized person before it is returned to service to ensure that it is in a safe operating condition, and any defective cable shall be removed from service.

(3) All repairs to a damaged trailing cable shall be made by an authorized person, who shall examine and test the trailing cable before it is returned to service.

(4) A record of the repairs referred to in subsection (3) shall be entered in the equipment maintenance record.

**13.12.** (1) The manager shall ensure that the power supply system for mobile electrical equipment is tested before being put into service, and at least once in each subsequent 12 month period, to prove the effectiveness of the ground fault tripping device and the ground conductor monitoring circuits.

**(2) The test results shall be recorded in the equipment maintenance records at the mine,**

**and a copy of the results shall be made available to an inspector on request.**

#### PART XIV

#### EXPLOSIVES AT MINES

**14.01.** In this Part,

"blaster" means a person who is certified and authorized under these regulations to conduct blasting operations at a mine;

"blasthole" means a hole drilled for the purpose of loading and blasting explosives;

"blasting agent" includes any ammonia nitrate-fuel oil mixture, emulsion, slurry or water-gel or other relatively insensitive, ammonium nitrate explosive;

"blasting certificate" means a blasting certificate issued under section 7.31;

"blasting machine" means a portable device used to initiate a blast by electricity;

"bootleg" means the remnant bottom or socket of a blasthole that did not properly break when the blast was initiated;

"day bench" means an underground storage location used to store an amount of explosives that does not exceed the lesser of 300 kg or the amount required for operations in a 24 hour period;

"detonator" means a device used to detonate an explosive;

"explosive" includes gunpowder, propellant powder, dynamite, detonating cord, blasting agents and detonators or any other material that is made, manufactured or used to produce an explosion or detonation;

"leg wires" means the wires permanently attached to an electric detonator;

**"magazine" means a building, place or structure on the surface or underground in respect of which a permit to store explosives or detonators has been issued.**

"misfire" means any portion of a blasthole that contains explosives after blasting initiation;

"primer" or "primed explosive" means an explosive containing a detonator;

**"shift box" or "shift container" means a box sufficient in size to hold enough explosive or detonators for the blasting operations conducted during a shift except that no shift box or shift container box may at any time contain more than 300kg of explosives or 50 detonators.(boite ou contenant de poste)**

#### MAGAZINES

##### Explosive Magazines

**14.02.** The manager shall

- (a) obtain an explosives magazine permit from the chief inspector before a magazine is located, erected, built and put into service or modified;
- (b) ensure that a magazine is not put into service until an explosives magazine permit has been issued;
- (c) ensure that a copy of the explosives magazine permit is posted inside the magazine; and

- (d) ensure that the magazine meets the requirements of regulations and standards made under the Explosives Act (Canada), as amended from time to time.

#### Surface Magazines

**14.03.** (1) Subject to subsection (2), the site for a surface magazine shall be selected in accordance with the Quantity-Distance Table For Blasting Explosives.

(2) The manager may apply to the chief inspector for a variance where it is not possible to comply with the Quantity-Distance Table For Blasting Explosives.

(3) The manager shall ensure that a surface magazine ceases to be used if the conditions under which the explosives magazine permit was issued no longer exist.

(4) The manager shall ensure that "NO SMOKING OR OPEN FLAME" signs are posted at all approaches to a magazine.

(5) No person shall smoke, take an open flame or produce sparks **within 20 m** of any place where explosives are stored or handled.

(6) Explosives stored on the surface shall be kept in a magazine with "DANGER EXPLOSIVES" signs conspicuously posted at all approaches to the magazine and on each side of the magazine.

(7) Magazines shall be kept securely locked at all times except when an authorized person is present.

#### Electrical, Heating and Lighting

**14.04.** In each magazine or area where explosives are prepared,

- (a) electrical equipment and wiring shall meet the requirements of CSA Standard **CAN/CSA-M421-93**, Use of Electricity in Mines;
- (b) electrical wiring shall be installed in metal armour or rigid metal conduit having screwed, waterproof joints; and
- (c) cable armouring and conduit shall be permanently grounded.

**14.05.** Where a magazine or area where explosives are prepared is electrically heated, lighted or provided with a telephone,

- (a) electrical fuses or circuit breakers shall be installed in a locked fireproof cabinet located outside the room in which explosives are stored;
- (b) electrical fuses or circuit breakers for heating circuits shall interrupt the current where it is 25% over the normal load;
- (c) where a liquid is used as a heating medium, the radiation pipes shall be effectively grounded;
- (d) electrical fuses for lighting circuits shall not be rated at more than 10A; and
- (e) lighting fixtures shall be suitable for Class II, Division 2 locations.

**14.06.** Overhead power lines supplying electricity to a magazine or area where explosives are prepared shall

- (a) be protected against power surges and lightning; and
- (b) be terminated in a cable a minimum of 60 m horizontal distance from the magazine.

**14.07.** All metal parts of a magazine or area where explosives are prepared such as framing, cladding, piping, cable armour and any electrical components shall be permanently bonded to ground in accordance with the requirements of CSA Standard C22.1-94, Canadian Electrical Code, Part I.

## Magazine Care and Use

**14.08.** (1) Each magazine shall be operated and maintained in accordance with the following rules:

- (a) the magazine shall be in the charge of an authorized person who shall carry out a weekly inspection of the magazine and record the results in a log-book;
- (b) at a mine, a record shall be kept of all explosives issued and received and the inventory of the surface magazine in a log-book, and all entries shall be signed by the authorized person;**
- (c) the magazine shall be kept clean, dry, and free from grit at all times and any spillage shall be cleaned up immediately;
- (d) where necessary, the shelves and floors shall be treated with a suitable neutralizing agent to remove all traces of explosive substances;
- (e) the contents, including any explosives returned from a work place, shall be arranged in a tidy and organized manner;
- (f) the magazine shall not contain any exposed iron or steel except in fixtures;
- (g) an authorized person shall ensure that the stock of explosives is rotated so that the oldest stock of each type and size of explosive is used first.

(2) The ground surrounding a magazine must be kept free of all brush, timber or other combustible material for a distance of not less than 20 m from the magazine.

## UNDERGROUND STORAGE

### Explosives

**14.09.** Explosives underground in a mine shall be stored in **a magazine**, on day benches or in suitable shift boxes.

**14.10.** Detonators underground in a mine shall be stored in **a magazine** or in suitable shift containers.

### Permits

**14.11.** (1) The manager shall apply to the chief inspector for a permit to store more than 300 kg of explosives in an underground **magazine**.

(2) The application shall contain a plan of the location and the specification of the **magazine**.

(3) Where the chief inspector is satisfied with the plan of the location, the chief inspector may issue a permit to the applicant.

(4) Explosives shall be stored in a **magazine** in accordance with the requirements established by the chief inspector.

(5) Where explosives loading operations are conducted **continuously over successive shifts**, the quantity of explosives required for the completion of the operation may be stored near the loading site without a permit.

### Storage of Detonators Underground

**14.12.** (1) The manager shall apply to the chief inspector for a permit to store detonators in a detonator **magazine**.

(2) **repealed**

(3) The application for a permit to store detonators shall contain a plan of the location and the specifications of the construction of the detonator **magazine**.

(4) Detonators shall be stored in a detonator magazine in accordance with requirements established by the chief inspector.

(5) The detonator magazine shall not be within 20 m of any location where other explosives are stored.

(6) Where the chief inspector is satisfied with the plan of the location and the specifications of the construction, the chief inspector may issue a permit to the applicant.

#### Location of Explosive Storage

**14.13** A **magazine**, day bench, shift box, or shift container shall be

- (a) located at least 60 m from a shaft, hoist room, refuge station, transformer vault, electrical substation or fuel storage area;
- (b) provided with conspicuous signs marked "EXPLOSIVES" in letters at least 150 mm in height; and
- (c) provided with conspicuous "NO SMOKING OR OPEN FLAMES" **signs visible from all approaches and** placed not less than 20 m from the **magazine**, day benches, shift box

#### Day Bench or Shift Box Location

**14.14.** (1) A day bench or shift box shall be located in an area that is acceptable to an inspector, free of

(4) Detonators shall be stored in a detonator **magazine** in accordance with requirements established by the chief inspector.

(5) The detonator **magazine** shall not be within **20 m** of any location where other explosives are stored.

(6) Where the chief inspector is satisfied with the plan of the location and the specifications of the construction, the chief inspector may issue a permit to the applicant.

#### Location of Explosives Storage

water, and free from risk of any train, car or haulage colliding with the explosives.

(2) A day bench or shift box shall be constructed or placed at least 1 m above floor level where the surrounding strata is adequately secured and shall, where necessary, have floors and walls lined with non-sparking material.

#### Weekly Inspection

**14.15.** The manager shall authorize and require one or more qualified persons to make a thorough weekly inspection of all **magazines, day benches, shift boxes or shift containers** used for storing explosives or detonators and to report, in writing, to the manager stating that the required inspection has been made and indicating the conditions found.

## Blasting Certificate

**14.16.** (1) No person shall prepare or conduct or be allowed to prepare or conduct a blasting operation in or about a mine unless that person holds a blasting certificate issued by the chief inspector or a provisional blasting certificate issued by the manager.

(2) Notwithstanding subsection (1), a person who is not the holder of a blasting certificate may assist in the preparation and firing of charges if he or she does so under the immediate direction and supervision of a person who holds a blasting certificate.

(3) The blaster shall deliver his or her blasting certificate to the manager when he or she commences employment as a blaster at the mine, and the manager shall, unless the certificate has been suspended, return it to the blaster when his or her employment is terminated.

## Fume Class

**14.17.** (1) Subject to subsection (2), explosives used in an underground mine shall be of Fume Class I rating as established by the Explosives Branch of the Department of Natural Resources, (Canada).

(2) Before explosives other than explosives of Fume Class I rating are used in an underground mine, the manager shall apply to the chief inspector for permission to use such explosives, and the application shall contain details of the procedures to be taken to ensure that no person is exposed to fumes and gases that endanger his or her health.

(3) The manager shall give a copy of an application under subsection (2) to the Committee.

(4) Where the chief inspector is satisfied that the procedures to be taken to ensure that no person is exposed to fumes and gases that may endanger health, the chief inspector may give permission to use explosives other than explosives of Fume Class I rating in an underground mine.

## Prohibitions

**14.18.** No person shall possess any explosives or detonators except as required in the performance of his or her duties at the mine.

**14.19.** No person shall remove, or be permitted to remove, explosives or detonators from a mine without a specific written authorization given by the manager in respect of each occurrence.

## Frozen Explosives

**14.20.** Frozen explosives shall only be thawed in accordance with a procedure established by the manager in accordance with the manufacturer's recommendations.

## Careless Acts

**14.21.** (1) No person shall commit a careless act with explosives or detonators.

(2) A person who discovers that a careless act has been committed involving explosives or detonators shall report the incident without delay to his or her shift boss, who shall report the matter without delay to his or her supervisor.

(3) A supervisor who receives a report of a careless act involving explosives or detonators shall, without delay, report the incident to the manager.

(4) A manager who receives a report of a careless act involving explosives or detonators shall make an initial verbal report without delay to the chief inspector and the Committee, and shall provide a written report within 24 hours of the incident.

#### Opening of Containers

**14.22.** Only implements made of non-sparking material shall be used to open boxes containing nitro-glycerine based explosives.

#### Defective Explosives

**14.23. (1) A person who discovers explosives he or she believes to be defective shall not use them and shall, without delay, report to the shiftboss or supervisor .**

**(2)The shiftboss or supervisor shall, without delay, report the defective explosives to the manager.**

**(3)The manager shall**

**(a)report the matter to an inspector and to the manufacturer of the explosives, with as much batch identification data as is available; and**

**(b)ensure that the explosives are removed and destroyed in a safe manner in accordance with the manufacturer's recommendations.**

#### Cartridge Wrapper

**14.24.** Cartridge explosives, other than water-gel or emulsion explosives that are to be used for blasting oversize rock or bringing down hung-up material, shall not be removed from their wrappers

#### Prohibition

**14.25. (1)** No person shall use safety fuse, otherwise known as tape fuse, in any blasting operations at a mine.

(2) The manager shall ensure that safety fuse is not present at a mine.

#### Transporting Explosives

**14.26.** Explosives and detonators at a mine shall be carried or transported in accordance with these regulations.

**14.27. repealed**

**14.28.** Detonators, if not used, shall be returned to the detonator magazine or shift box or shift container but the number of detonators in a shift box or shift container must not exceed 50.

#### Transportation of Explosives and Detonators

**14.29.** Mobile equipment used for transporting explosives on the surface shall

(a) be kept in sound mechanical condition;

(b) when carrying explosives, be provided with orange diamond-shaped placards and with clearly visible signs marked "EXPLOSIVES" in letters not less than 150 mm in height;

(c) have all metal parts that could come in contact with containers of explosives covered with wood, tarpaulin or similar non-sparking material;

(d) not be used to transport other goods or materials at the same time as explosives are transported;



- (e) be equipped with a type 20-ABC fire extinguisher;
- (f) not be loaded with explosives in excess of 80% of its rated carrying capacity;
- (g) have explosives secured or fastened so as to prevent any part of the load from becoming dislodged;
- (h) transport detonators with other explosives only if the detonators are
  - (i) packed in their original containers and placed in a wooden box with a snugly fitting lid that is separated from other explosives by a solid partition of wood at least 150 mm thick and that extends at least 150 mm above the highest level to which the explosives are packed in the vehicle, and
  - (ii) 5,000 or fewer in number;
- (i) only be operated by an authorized person who is in attendance at all times;
- (j) carry only those persons necessary for handling explosives;
- (k) not be refuelled if explosives or detonators are on board except where the mobile equipment is designated and used solely for the transportation of bulk blasting agents; and**
- (l) have its engine shut off and its park brake on while loading or unloading explosives, except where the vehicle uses an engine-powered device for loading and unloading the explosives.

**14.30.** (1) The transfer of explosives or detonators from an explosives magazine shall be so arranged that no delay occurs between the time the explosives or detonators leave the magazine and the time they are properly stored in designated underground **magazine** or distributed to points of use.

(2) Explosives shall not be left at any level station or near the collar or other entrance to the mine, but shall be transferred to designated storage places or points of use without delay.

(3) At no time shall explosives be left unattended during transportation.

**14.31.** (1) When explosives are to be transported in a conveyance, the authorized person in charge of the operation shall give notice of that fact to the hoist operator and, as applicable, to the shaft supervisor and cage tender.

(2) Explosives shall not be loaded into, transported in or unloaded from a conveyance unless there is an authorized person in charge.

(3) No materials shall be carried in the same conveyance as explosives.

(4) No persons shall be transported in a conveyance while explosives are being transported in the same shaft, except that persons may be transported in the conveyance for the sole purpose of handling the explosives.

(5) Explosives that have been delivered to a head frame or portal shall be transported underground immediately on the approach of an electrical storm.

(6) Explosives shall not be transported in a shaft during an electrical storm.

**14.32.** Where explosives or detonators are transported underground on a train,

- (a) the locomotive shall be maintained on the forward end of the train, and no explosives or detonators shall be carried on the locomotive;
- (b) a car carrying explosives or detonators shall be
  - (i) separated from the locomotive by an empty car or a spacer of equivalent length, and
  - (ii) protected from hazards related to the presence of trolley wires;
- (c) the explosives and detonators shall be in containers that are acceptable to the chief inspector and that prevent the explosives and detonators from coming into contact with any metal that could produce a spark; and
- (d) a train carrying explosives or detonators

- (i) shall only comprise the locomotive, the empty car or spacer and the explosive cars, and
- (ii) shall not proceed at a speed exceeding 10 km/h.

**14.33.** Where explosives or detonators are transported underground by means of trackless mobile equipment,

- (a) the mobile equipment shall not proceed at a speed exceeding 10 km/h;
- (b) the explosives and detonators shall be in containers that are acceptable to the chief inspector and that prevent the explosives and detonators from coming into contact with any metal that could produce a spark;
- (c) the explosives and detonators shall be so loaded that they cannot fall from the mobile equipment;
- (d) the mobile equipment shall, when carrying explosives, be provided with conspicuous signs marked "EXPLOSIVES" in letters at least 150 mm in height;
- (e) the mobile equipment shall have its engine shut off and park brake on while loading or unloading explosives or detonators except where the vehicle uses an engine-powered device for loading and unloading the explosives or detonators;
- (f) the mobile equipment shall not be refuelled with explosives or detonators aboard, except for mobile equipment designed and used solely for the transportation of bulk blasting agents;
- (g) no person shall smoke or have an open flame within 20 m of a vehicle transporting explosives;
- (h) the mobile equipment shall not be used to transport other materials at the same time as the explosives or detonators; and
- (i) the mobile equipment shall not carry persons other than those handling the explosives and detonators.

#### Loading and Priming Procedures

**14.34.** (1) Explosives shall not be loaded into a blasthole

- (a) of insufficient size or in which there is an obstruction; or
- (b) by hitting, pounding, ramming or applying undue pressure.

(2) Explosives shall only be loaded into a blasthole by means of a loading tool made of non-sparking material.

(3) Primers shall only be made up at the blast site as required and shall not be transported.

(4) When priming nitro-glycerine type explosives, only a non-sparking implement shall be used to punch a hole in the explosive.

(5) Every primed explosive shall

- (a) contain a properly placed detonating device sufficient to efficiently initiate the explosion;
- (b) in the case of a cartridge explosive, have the detonator inserted into the cartridge in such a manner that it cannot be separated or pulled out of the cartridge during the loading operation; and
- (c) be detonated at the time for blasting except where a procedure for doing otherwise has been established by the manager, given to the Committee and approved by the chief inspector.

(6) Where detonating cord is used,

- (a) loading shall be completed in all holes;
- (b) all equipment not required for the loading operation shall be removed from the blast site before
  - (i) cords are interconnected between holes or attached to trunk line circuits, and
  - (ii) delay devices or initiating detonators are attached to trunk line circuits; and

- (c) the cord shall, for an underground blasting operation, be connected to the initiating detonator as close to the face being blasted as is possible.

- 14.35.** (1) Where holes are loaded pneumatically with explosives,
- (a) only semi-conductive hoses manufactured for such purpose shall be used;
  - (b) the semi-conductive hose used shall be maintained to ensure that the conductive element is not removed or otherwise damaged; and
  - (c) pneumatic loading equipment shall not be grounded directly to pipes, rails or other similar continuous conductors.
- (2) Where holes are loaded pneumatically with explosives and electrical detonators are used,
- (a) no plastic or other non-conducting liners shall be used;
  - (b) a detonator shall not be placed in the hole until the pneumatic loading of the hole has been completed, except where a procedure for doing otherwise has been established by the manager; and
  - (c) copies of the procedure have been given to the Committee and approved by the chief inspector.

#### Guarding

- 14.36.** (1) Before a blast is detonated, a person shall be stationed at each entrance or approach to the blast area and instructed to prevent access to each place where
- (a) blasting is to take place;
  - (b) the safety of persons may be endangered by the blasting; or
  - (c) a diamond drill hole intersection may connect with the blast.
- (2) The blaster shall ensure that
- (a) all persons have vacated the vicinity except those persons required to assist in blasting and guarding; **and**
  - (b) all areas of the mine that may be affected by the blasting operation are vacated; and
  - (c) **repealed**

**14.37.** Where contiguous or adjacent claims or mines are being worked and there is disagreement as to the times that blasting operations should be conducted, the manager of either mine may appeal to the chief inspector who shall decide the time at which blasting operations may be conducted.

#### Waiting Time

- 14.38.** (1) No person shall return to a work place affected by a blasting operation
- (a) where delay action detonators are used and a shot is heard, until 10 minutes have elapsed from the time the blast is initiated;
  - (b) until the blaster has disconnected the circuit trunk lines or lead wires from the blasting machine or power source and has short circuited the lines or wires; and
  - (c) where a blasting switch is employed, until the switch is locked in the open position.
- (2) Where delay action detonators are used and no shot is heard, no person shall return to the work place affected by the blasting operation until the blaster has met the requirements of paragraphs (1)(b) and (c).

(3) This section does not apply where a central blasting procedure is in operation.

- 14.39.** If a person has reason to believe that the gases produced during a blasting operation have not been removed or diluted to a safe degree by the ventilation system, he or she
- (a) shall not return to a worksite after the blasting operation; and

- (b) shall request the shift boss to test the air with a suitable instrument and explain the results to him or her.

#### Surface Blasting

**14.40.** (1) The blaster in charge of a blast on the surface shall keep a record of each primary blast that includes a report of the following:

- (a) the date, time and location of the blast;
- (b) the burden, spacing, depth and number of holes blasted;
- (c) the type of explosives used;
- (d) the prevailing wind direction and speed at the time of the blast;
- (e) the prevailing atmospheric conditions, and whether it is clear or overcast.

(2) The blaster in charge of a blast at a surface mine shall ensure that

- (a) a warning is given by siren or horn;
- (b) where necessary, signs are posted to warn traffic of the impending blast and guards are posted to stop traffic before the blast; and**
- (c) an all-clear signal is sounded after all danger from the blast has passed.

#### Blastholes (Surface)

**14.41.** No mobile equipment shall be allowed within 8 m of any charged blasthole on the surface of a mine except

- (a) mobile equipment that is transporting explosives and that has the exhaust directed above the cab; or
- (b) other mobile equipment authorized in writing by the chief inspector.

#### Blasting Machines

**14.42.** (1) A blasting machine shall

- (a) be of a type designed and manufactured specifically for the purpose for which it is used; and
- (b) be kept in good mechanical and electrical condition.

(2) An authorized person shall test the power output of each blasting machine at the intervals and in the manner established by the manufacturer.

(3) The test results shall be entered in a log-book, dated and signed by the authorized person who conducted the tests.

**14.43.** The blaster shall ensure that any residual charge remaining in the blasting machine after use is discharged in accordance with the manufacturer's instructions.

#### Blasting Cables

**14.44.** Blasting cables and blasting wires shall

- (a) be clearly distinguishable from other cables and wires;
- (b) be used for blasting purposes only;
- (c) be kept 150 mm from
  - (i) detonating cords,
  - (ii) power, lighting or communication cables, and
  - (iii) pipes, rails, ventilation ducting or other continuous metal grounded circuits;
- (d) be insulated for the maximum voltage that may be used; and
- (e) be not less than 12 AWG copper wire or thicker, and where expendable connecting wire is used, it shall not be less than 20 AWG copper wire.

## Procedures for Electric Blasting

- 14.45.** Where blasting is initiated by means of electricity,
- (a) if more than one shot is to be fired electrically, the blaster shall, immediately before blasting, test the electrical circuit with an instrument specifically designed and manufactured for testing blasting circuits immediately before blasting;
  - (b) if balanced circuits are required, each circuit shall be tested before firing with an instrument described in paragraph (a);
  - (c) if electric detonators are used
    - (i) the protective shunt shall not be removed from the leg wire until connections are made,
    - (ii) the leg wire shall not be shortened,
    - (iii) the blasting circuit trunk lines or lead wires to the face or faces shall be short-circuited while the leads from the detonators are being connected to each other and to the blasting lead lines,
    - (iv) the short-circuit referred to in subparagraph (iii) shall not be removed until all persons have left the worksites to be affected by the blasting operation, and
    - (v) the short-circuit referred to in subparagraph (iii) shall be located so that a premature explosion will not endanger the person opening the short-circuit; and
  - (d) before any person returns to the worksite affected by the blasting operation,
    - (i) the firing cables shall be removed from the battery, blasting machine or other source of electricity and shall be short-circuited, and
    - (ii) the blasting switch shall be locked in the open position.

## Blasting from Power or Lighting Circuits

- 14.46.** (1) Electrical power circuits used for blasting shall be
- (a) from an isolated, ungrounded power source; and
  - (b) used for blasting only.
- (2) An electrical power line blasting switch shall
- (a) be designed for the purpose for which it is used;
  - (b) be kept in good condition;
  - (c) be constructed so that it automatically opens the circuit by gravity to short-circuit the blasting conductor;
  - (d) have the live side enclosed within a fixed box with a door
    - (i) that can be locked and unlocked only by the blaster in charge of the blasting, and
    - (ii) so arranged that the door cannot be closed unless the contacts of the firing circuit are in the opened and shorted position; and
  - (e) be electromagnetically operated where the power source exceeds 300 volts.
- (3) Every electric power line blasting switch shall incorporate a lightning gap of at least 1.5 m between the blasting switch and the service switch, and the gap shall only be closed by a twist-type plug and cord assembly immediately before firing.

**(4) Where a blasting circuit is used for more than one working place, each branch circuit shall be isolated by means of a locked isolating switch that automatically short-circuits the branch circuit or by another method approved by the chief inspector.**

## Central Blasting

- 14.47.** (1) Where a common electrical source is used to initiate blasts in more than one work place, the manager shall
- (a) ensure that arrangements are made for
    - (i) the continued shorting of the blasting cables,

- (ii) a three-way switch for each individual blasting circuit that can be locked in either the shorted or closed position to provide for shorting, energizing or testing the circuit, and
- (iii) identification of blasting cables and switches;
- (b) establish a blasting procedure
  - (i) setting out the method of connecting the blasting circuit trunk lines or lead wires to the electrical supply,
  - (ii) providing for the evacuation of all persons from the area of the blast,
  - (iii) setting out the method of testing the system to ensure that the proper connections have been made, and
  - (iv) providing a layout of the system; and
- (c) send a copy of the blasting procedure to each person involved in blasting, to the Committee and to the chief inspector.

(2) Each person involved in blasting shall comply with the blasting procedure.

#### Electrical Storms

**14.48.** (1) During an electrical storm or if an electrical storm appears imminent, the blasting site shall be evacuated and no blasting connections shall be made.

(2) The manager shall designate a person whose duty it shall be to make every reasonable effort to notify underground workers of an electrical storm.

**(3) During an electrical storm, no connections shall be made underground and, if loading and blasting procedures have commenced, all persons underground shall be evacuated to safety in accordance with a procedure developed by the manager in consultation with the Committee and acceptable to the chief inspector.**

#### Radio Transmitters

**14.49.** When electrical blasting operations are about to be conducted, no radio frequency transmitter shall be operated

- (a) in a surface mine, within 20 m of such operations; and
- (b) in an underground mine, within the distance provided as a standard of safety by CSA Standard Z65-1966, Radiation Hazards from Electronic Equipment.

#### Drilling

**14.50.** (1) No person shall commence drilling at a site unless the exposed face is

- (a) subject to section 14.51, washed with water;
- (b) carefully examined for misfires and cut-off holes, giving special attention to bootlegs; and
- (c) conspicuously marked with the location of all misfires and cut-off holes.

(2) No person shall cut chip samples from an exposed face,

- (a) until the face has been washed with water and carefully examined for misfires and cut-off holes; and
- (b) within 2 m of any hole containing explosives.

**14.51.** In a mine where water cannot be used, the manager shall

- (a) establish a procedure for checking each face for misfires and cut-off holes before drilling is commenced;
- (b) ensure all persons are trained in the procedure; and
- (c) provide a copy of the procedure to the Committee and to the chief inspector.

**14.52.** No person shall drill or allow drilling to be conducted  
**(a) in an underground mine**

- (i) within 150 mm of any part of a bootleg, or
  - (ii) within 2m of a misfired hole, a cutoff hole or a hole containing explosives; and
- (b) in a surface mine
  - (i) within 1m of any part of a bootleg, or
  - (ii) within 5m of a misfired hole, a cutoff hole, or a hole containing explosives.

**14.53.** No person shall drill within 8 m of a site on a face where explosive loading operations are being conducted.

**14.54.** No person shall drill in loose rock produced by blasting unless

- (a) the rock has been thoroughly examined to ensure that it does not have any holes containing explosives;
- (b) an engineered offset pattern is utilized to prevent overlaying of holes; and
- (c) where a hole containing explosives is discovered, the drilling is conducted in accordance with section 14.56.

**14.55. Where it is impracticable to make the examination required by paragraph 14.50(1)(b) or to use an offset pattern as required by paragraph 14.54(1)(b), a remotely controlled drilling procedure developed by the manager in consultation with the Committee and acceptable to the chief inspector shall be employed.**

#### Misfired Holes

**14.56.** (1) Where an explosive charge has been misfired or cut-off, no work may be performed in the area other than that required to make the area safe and to deal with the misfire in accordance with subsection (2).

(2) A misfire or cut-off hole shall be

- (a) reblasted with a fresh primer if necessary;
- (b) washed out, subject to subsection (3); or
- (c) dealt with in accordance with subsection (4) or the procedure established under subsection (5).

(3) No person shall wash out an explosive charge that contains an explosive that is

- (a) nitro-glycerine sensitized;
- (b) not water soluble; or
- (c) not described as an explosive that may be washed out in the procedure established under subsection (5).

(4) A hole may be drilled for the purpose of reblasting a missed hole once a shift boss has determined, in consultation with the driller, the location, angle and depth of the hole to be drilled, and the shift boss shall remain present throughout the drilling of the hole and such hole shall not be closer to any part of a missed hole **than 150 mm underground or 1 m** in a surface operation.

(5) The manager shall prepare a written procedure that describes the

- (a) types of explosives that may be washed out of or removed from a misfired or cut-off hole;
- (b) the type of equipment and method to be used; and
- (c) the method that may be adopted in blasting relief holes drilled in accordance with subsection (4).

**14.57.** (1) Work shall not be abandoned or discontinued at a worksite until the material broken at the time of the blasting of the last round of blastholes has been cleaned from the face or place of blasting and the face or place has been thoroughly examined for the presence of explosives in misfired or cut-off holes.

(2) Where a misfired or cut-off hole is found during the examination required by subsection (1), it shall be dealt with in accordance with section 14.56 without delay and in any event before the worksite is abandoned or further work is discontinued.

#### Adjacent Workings

- 14.58.** Before a connection is made between two underground workings,
- (a) where practicable, an examination shall be made of the workings towards which the active working is advancing to determine whether the work can proceed in a safe manner, and the results of the examination shall be recorded in a log-book; and
  - (b) all approaches to both working places shall be guarded before blasting when the distance between the working places is less than the greater of
    - (i) twice the length of the longest drill steel used, and
    - (ii) 8 m from the bottom of the longest hole.

**14.59.** Where blasting operations are likely to intersect a diamond drill hole, the manager shall prepare a procedure to ensure that the work can be carried out safely.

#### Mine Closure - Disposal of Explosives

**14.60.** (1) When a mine is to be closed down, an authorized person shall remove or dispose of all explosives at the mine unless permission is given by the chief inspector to leave explosives at the mine.

(2) Explosives shall be suitably disposed of when a mine is closed down.

(3) Where explosives are left at a closed down mine without the permission of the chief inspector, he or she may arrange for the disposal of the explosives, and the costs so incurred constitute a debt due from the owner of the mine to the **Workers' Compensation Board that** may be recovered in any court of competent jurisdiction.

### PART XV

#### EXPLORATION

**15.01.** In this Part,

"exploration activity" means any underground exploration work, any disturbance of the surface by mechanical means or any diamond drilling for the purpose of finding a mineral, but does not include work at a producing mine or exploration work involving the exclusive use of hand tools;

"isolated camp" means a camp that is normally reached by air.

- 15.02.** (1) Before any exploration activity is commenced, the owner shall submit to the chief inspector
- (a) an operational plan containing details of the location, the proposed method of exploration, the type of equipment to be used and the numbers of persons to be employed; and
  - (b) a safety program concerning the health and safety of persons employed in the exploration activities that includes
    - (i) particulars of work practices and employee protection,
    - (ii) procedures for first aid and prevention of hypothermia,
    - (iii) procedures for dealing with fire hazards,
    - (iv) procedures for explosives handling and use,
    - (v) procedures for handling equipment and materials when using aircraft,



- (vi) particulars of survival techniques and survival equipment, and
- (vii) procedures for diamond drilling, surface trenching and underground exploration.

(2) The owner shall ensure that all employees are trained in the elements of the safety program by a qualified person appointed by the owner and a record of the training shall be maintained at the exploration site and made available to an inspector on request.

(3) Where a Committee is in place, the Committee shall review the safety program and make recommendations to the person in charge of the exploration site.

(4) No work shall commence until the safety program is accepted by the chief inspector.

**15.03.** (1) Before an isolated camp is set up, the owner of the camp shall establish means by which emergency assistance and transportation can be obtained at all times.

(2) The owner shall ensure that means of communication with all worksites operated from an isolated camp are available at all times.

**15.04.** At exploration drill sites, the manager shall ensure that each member of the drill crew has a valid first aid certificate acceptable to the chief inspector.

**15.05.** (1) The person in charge of an exploration site shall ensure that all persons employed at the site are instructed in any potential hazards in the area and are trained in procedures to safeguard themselves against those hazards.

(2) The instruction and training referred to in subsection (1) shall include

(a) instruction on

- (i) protection from attack by animals,
  - (ii) the wearing of appropriate clothing,
  - (iii) the use of protective equipment, and
  - (iv) the need for navigational or directional equipment to avoid becoming lost;
- and

(b) training in

- (i) the use of the equipment referred to in subparagraphs (a)(iii) and (iv),
- (ii) the handling of boats, where necessary, and
- (iii) use of communications equipment in an emergency.

**15.06.** (1) The person in charge of an exploration camp shall ensure the availability of means for preventing or defending an attack by any animal likely to be encountered in the area are available.

(2) The person in charge of an exploration camp shall ensure that any field party, including drillsite employees, operating out of the camp in an area where there is a likelihood of an attack by an animal shall be provided with the means to protect themselves from attacks by animals.

**15.07.** (1) The person in charge of an exploration camp shall ensure that every free standing structure and kitchen is equipped with one or more fire extinguishers of at least 4 kg capacity.

(2) Exploration camps with interconnected structures shall be provided with at least one emergency shelter sufficiently far from the main structure to be unaffected by a fire at the main structure.

(3) Emergency shelters referred to in subsection (2) shall be provided with

- (a) means to heat the shelter;
- (b) seating for each person who may be at the camp;

- (c) at least one first aid kit provided with the first aid equipment listed in Schedule I;
- (d) a means of illumination;
- (e) a sufficient supply of fuel to cover eventualities that may be reasonably anticipated;
- (f) communication equipment to summon help together with posted instructions in use of the equipment; and
- (g) other equipment such as flares and smoke pots that may be necessary to guide or assist a rescue mission.

**15.08.** No person shall operate any drilling rig alone and out of sight of other persons unless permitted by the chief inspector.

**15.09.** (1) A drill shack shall be kept free of flammable garbage and refuse.

(2) Any means of heating a drill shack or drill circulation water shall be installed, operated and maintained in such a manner that the operation or malfunction of the system will not endanger the drill shack or any person working in or around the shack.

(3) All reasonably accessible moving parts of a drill and its auxiliary equipment shall be guarded.

(4) All internal combustion engines shall be exhausted to the outside of the shack and exhaust fumes shall be directed away from the operators.

**15.10.** (1) Gas testing equipment shall be available at the site of any drill which is likely to encounter pockets of gas.

(2) Emergency rations shall be provided at each drill shack and operators shall be trained to stay at the shack in the event of a whiteout.

**15.11.** (1) The safety measures set out in subsections (2) to (10) shall be followed in and around drilling equipment at an exploration camp.

(2) No person shall hold the wireline while it is in motion.

(3) A safety belt shall be worn by any person working in the basket above the drill.

(4) A person entering a drill shack while drilling is in progress shall wear personal protective equipment.

(5) All members of the drill crew shall be given instruction in emergency procedures.

(6) A diamond drill shall not be operated if the clutch and brake mechanisms or any other part are not in sound mechanical condition.

(7) Wireline and hoist cables on a drill shall be regularly inspected and replaced when defective.

(8) All working areas of the diamond drill site shall be properly illuminated.

(9) All persons shall keep clear of the sheave wheels while hoisting operations are in progress.

(10) Cracked or defective drill rods must be removed, clearly marked and taken out of service.

## PART XVI

### REPORTABLE INCIDENTS AND DANGEROUS OCCURRENCES

#### Definitions

**16.01.** In this Part,

"dangerous occurrence" means

- (a) an incident involving the hoist, sheaves, hoisting rope, conveyance or shaft timbering or structure,
- (b) an inrush of water,
- (c) a cracking, seeping or failure of a dam or bulkhead,
- (d) an outbreak of fire,
- (e) a premature or unexpected explosion or ignition,
- (f) the occurrence of flammable, noxious or toxic gas in mine workings or at an exploration site,
- (g) unexpected and non-controlled extensive subsidence or caving of mine workings,
- (h) an explosion or outbreak of fire in any way related to the operation of an air compressor, air receiver, compressed air line or steam boiler,
- (i) a breakdown in the main ventilation system,
- (j) loss of control or major damage to any mobile equipment,
- (k) an uncontrolled fall of ground causing physical damage or the displacement of more than 50 t of material, and
- (l) any unusual occurrence not listed in paragraphs (a) to (k);

"reportable incident" is an incident involving serious injury or death;

"serious injury" includes

- (a) a fracture of the skull, spine, pelvis, femur, humerus, fibula, tibia, radius or ulna,
- (b) an amputation of a major part of a hand or foot,
- (c) the permanent loss of the sight of an eye,
- (d) any serious internal haemorrhage,
- (e) any burn that is caused by electricity and requires medical attention,
- (f) any third degree burn,
- (g) any injury caused directly or indirectly by explosives,
- (h) any asphyxiation or poisoning that causes a partial or total loss of physical control, and
- (i) any other injury likely to endanger life or cause permanent impairment.

#### Notification of Reportable Incident or Dangerous Occurrence

**16.02.** (1) Where a reportable incident occurs the manager shall, without delay, notify an inspector, the Committee co-chairpersons and the union local, if any.

(2) Within 24 hours after a dangerous occurrence, the manager shall give an oral report to an inspector and to the Committee co-chairpersons.

(3) Within 72 hours after a dangerous occurrence or a reportable incident, the manager shall send a written report to the chief inspector and to the Committee co-chairpersons.

#### Scene Not to be Disturbed

**16.03.** Subject to section 16.04, no person shall, except for the purpose of preventing injury or relieving suffering, move or otherwise interfere with any wreckage or equipment at

the scene of or connected with a reportable incident until an inspector has conducted an investigation of the incident and has given permission to do so.

**16.04.** (1) Where an inspector is unable to conduct an immediate investigation of a reportable incident, an inspector may authorize a person to move or otherwise interfere with any wreckage or equipment at the scene of or connected with the reportable incident to the extent necessary to permit the resumption of mine operations.

(2) Where an inspector authorizes a person to move or otherwise interfere with any wreckage or equipment at the scene of or connected with the reportable incident, the inspector may require that the person take photographs, make drawings or take such other action as the inspector considers necessary to facilitate the investigation of the incident.

(3) Nothing in this section authorizes a person to move or otherwise interfere with any wreckage or equipment at the scene of or connected with the reportable incident where a coroner or a police officer has secured the scene or the equipment under the Coroners Act.

#### Investigations and Reports

**16.05.** The manager shall ensure that an investigation of the health and safety circumstances surrounding reportable **incidents** and the causes of dangerous occurrences, is made by persons knowledgeable in the type of work involved and by the Committee cochairpersons or their designates.

**16.06.** (1) On completion of the investigation, the manager shall have a report prepared that

- (a) where possible, identifies the causes of the reportable incident or dangerous occurrence;
- (b) identifies any unsafe conditions, acts or procedures which contributed in any manner to the reportable incident or dangerous occurrence; and
- (c) makes recommendations that may prevent similar accidents.

(2) The manager shall sign the report and

- (a) send the report to the Committee for review and approval; and
- (b) send the approved report to the chief inspector and the union local, if any.

#### Notice of Fire

**16.07.** The manager shall, without delay, notify the chief inspector of an outbreak of fire that

- (a) endangers the health and safety of any person;
- (b) requires the use of mine rescue services; or
- (c) is, or is potentially, a hazard to surrounding areas.

#### Report

**16.08.** Each month the manager shall

- (a) send the chief inspector a report, in the form approved by the chief inspector, of each incident that results in an injury; and
- (b) send a copy of the report to the Committee.

## PART XVII

### OPENING AND CLOSURE

#### Notice of Intention to Commence Work

**17.01.** (1) An application to commence shaft sinking, underground development work or the surface stripping of an open pit for the purpose of production of minerals, shall be submitted, in writing, to the chief inspector and shall include a plan of the system under which the work is to be performed.

(2) The plan shall include

- (a) a regional map showing the location of the mine property;
- (b) a plan at a scale of 1:10,000 or less, showing topographic contours, claims, leases or licences, lakes, streams, roads, landing strips and the location of all proposed mining works and related facilities and also showing the relationship to the Universal Transverse Mercator (UTM) grid;
- (c) the basis of design, details of geological structure, materials handling, buildings, processing plants and facilities, stockpiles, tailings transportation and impoundment, water supply and storage facilities;
- (d) for underground development, plans of present and proposed underground workings and a plan of the mine openings in relation to the surface installations;
- (e) for surface mines, the methods to be followed in the construction of haulage roads;
- (f) for surface mines, a traffic control plan showing the maximum allowable speeds for the vehicles in use, rules for passing, "stop" and "yield" locations, priority rules for various vehicles, rules for night operation, maximum operating grades, emergency run-off protection, shoulder barriers; and
- (g) any other information required by the chief inspector.

(3) The chief inspector shall, before approving the plan, take into consideration the safety of the public and the health and safety of the persons performing the work.

(4) Shaft sinking, underground development and surface stripping of an open pit shall not proceed until the plan has been approved by the chief inspector.

(5) The manager shall notify the chief inspector in writing of any intention to make a significant departure from the plan approved by the chief inspector, and shall not proceed to implement the proposed changes without the written approval of the chief inspector.

#### Cessation of Work

**17.02.** (1) The manager shall give notice to the chief inspector of any intention to stop work at a mine or exploration site for a period exceeding 30 days and, except in an emergency, the notice shall be given **in writing not less than 30 days** prior to the stoppage of work.

(2) Work at a mine or exploration site where work has been stopped for a period exceeding 30 days shall not recommence until an application that includes the information required to be submitted by section 15.02 or 17.01 has been approved by the chief inspector.

(3) Before approving an application for the recommencement of operations at a mine, the chief inspector shall take into consideration the safety of the public and the health and safety of the persons performing the work.

**17.03.** (1) Where work at a mine or exploration site is stopped for a period exceeding 30 days, the owner or manager shall cause the entrances to the mine or exploration site and all

other pits and openings that are dangerous by reason of their depth or otherwise, to be suitably protected against inadvertent access within the time limit specified by the chief inspector.

(2) Before permanently closing a mine, the owner or manager shall ensure that all shafts, raises, stope openings, adits or drifts opening to the surface are either capped with a stopping of reinforced concrete or filled with material so that subsidence of the material will not pose a future hazard.

(3) In the case of shafts or raises, the owner or manager shall, unless exempted by the chief inspector, ensure that the stopping is

- (a) secured to solid rock or to a concrete collar secured to solid rock; and
- (b) capable of supporting a uniformly distributed load of 12 Kpa or a concentrated load of 24 kN, whichever is the greater load.

(4) Where the chief inspector is of the opinion that an opening referred to in subsection (2) presents no greater hazard than the local natural topographic features, the chief inspector may, in writing, exempt the mine from the application of subsection (2).

## PART XVIII

### DUTIES OF EMPLOYEES

#### **18.01.** An employee shall

- (a) before commencing work at a worksite, thoroughly check the worksite for hazardous or dangerous conditions and not start work unless the worksite is safe;
- (b) before using any equipment, check that it is safe to use;
- (c) to the best of his or her ability, leave the worksite at the end of his or her shift in a condition that allows work to be resumed safely and without risks to health or safety or, if unable to do so, fence, rope off, or post signs at the worksite and report the circumstances to the supervisor responsible;
- (d) behave in an orderly manner and not engage in improper or foolhardy behaviour such as horseplay fighting, playing practical jokes or other conduct that may create or constitute a danger to himself or herself or any other person;
- (e) not unnecessarily interrupt ventilation of the mine;
- (f) not be impaired by alcohol or drugs while at work;
- (g) not possess alcohol or illegal drugs at work;
- (h) not sleep underground or while in charge of any plant or equipment on the surface;
- (i) not pass beyond enclosures or barriers or danger signs or open any locked door without authority; and
- (j) not remove or make ineffective, except for the purpose of maintenance or replacement, any protective devices.

#### **18.02.** A worker shall

- (a) take reasonable measures and precautions to protect his or her health and safety and the health and safety of other persons at the mine;
- (b) co-operate with any other person exercising a power under the Act or performing a duty imposed by the Act and these regulations;
- (c) comply with the Act and these regulations and any orders and directives issued under the Act and these regulations;
- (d) co-operate with the managers and supervisors in the discharge of their responsibilities;
- (e) use the safeguards, safety appliances and personal protective equipment or devices provided pursuant to these regulations;
- (f) conduct himself or herself at work in a safe and responsible manner;
- (g) comply with instructions given for his or her own health and safety and those given for the health and safety of others;

- (h) report any accident, dangerous occurrence or reportable incident, whether or not injury occurs, which arises in the course of or in connection with work; and
- (i) report any misuse of explosives.

## PART XIX

### QUALIFICATIONS OF INSPECTORS

#### Chief Inspector

- 19.01.** (1) No person shall be appointed as chief inspector unless he or she
- (a) is a professional engineer who possesses a subsisting membership in a recognized Professional Engineers Association, or a person who possesses a valid and subsisting membership as a certified Canadian Registered Safety Professional; and
  - (b) has the qualifications required of an inspector under section 19.02.
- (2) (repealed April 4, 1997 R-026-97)

#### Inspectors

- 19.02.** No person shall be appointed as an inspector of mines for underground mines and open pit mines unless he or she has
- (a) a degree or diploma in science or a relevant discipline from an accredited university, college or technical college;
  - (b) at least seven years practical mining experience, of which at least five years has been spent in production operations; and
  - (c) at least one year supervisory experience at a mine.

## PART XX

**20.01. repealed**

**20.02. repealed**

**20.03. repealed**

## PART XXI

### REPEAL AND COMMENCEMENT

- 21.01.** The following regulations made under the Mining Safety Act are repealed:
- (a) Arsenic Control Regulations, R.R.N.W.T. 1990,c.M-7;
  - (b) Blasting Certificate Regulations, R.R.N.W.T. 1990,c.M-8;
  - (c) Environmental Monitoring Regulations, R.R.N.W.T. 1990,c.M-9;
  - (d) Fees Regulations, R-017-93;
  - (e) Lupin Mine Exemption Regulations, R.R.N.W.T. 1990,c.M-10;
  - (f) Lupin Mine West Zone Minimum Clearance Regulations, R.R.N.W.T. 1990,c.M-11;
  - (g) Medical Certificate Regulations, R.R.N.W.T. 1990,c.M-12;
  - (h) Medical Monitoring Regulations, R.R.N.W.T. 1990,c.M-13;
  - (i) Mine Hazardous Materials Information System Regulations, R.R.N.W.T. 1990,c.M-14;
  - (j) Mine Occupational Health and Safety Board Regulations, R.R.N.W.T. 1990,c.M-15;
  - (k) Mining Safety Regulations, R.R.N.W.T. 1990,c.M-16;
  - (l) Miramar Con Mine, Ltd. Mine Exemption Regulations, R-111-94;
  - (m) Nanisivik Mines Limited Regulation Suspension Regulations, R.R.N.W.T. 1990,c.M-17;
  - (n) Polaris Mine Exemption Regulations, R.R.N.W.T. 1990,c.M-19;

- (o) Radiation Hazard Regulations, R.R.N.W.T. 1990,c.M-20;
- (p) Royal Oak Mines Inc. - Yellowknife Division Mine Exemption Regulations, R016-93;
- (q) Shift Boss and Hoist Operator's Certificate Regulations, R.R.N.W.T. 1990,c.M-22.

**22.02.** These regulations come into force December 15, 1995.

(Note 22.02. Appears to be a key punch error in the document and should probably be 21.02.)

Dated at Yellowknife, \_\_\_\_\_, 1995.

Helen Maksagak  
Commissioner of the Northwest Territories

#### SCHEDULE 1

Other than the basket stretcher and the blankets, the following items shall be kept in a container that can readily be taken to the scene of an injury:

- 1 current edition of the manual First Aid: Safety Oriented
- 5 pairs of latex gloves
- 200 adhesive bandages assorted sizes
- 1 sterile bandage compress, 10.2 cm
- 4 bandage compresses, 20.32 cm
- 1 package of 12 sterile burn dressings
- 6 sterile gauze eye pads
- 1 package of roller bandages, 2.54 cm
- 3 triangular bandages
- 12 large safety pins
- 1 plastic eye shield
- 1 package of flexible metallic splints
- 1 pair scissors
- 1 basket stretcher
- 1 treatment record book
- 2 CPR pocket valve masks
- 6 sterile bandages, 10.2 cm
- 5 bandage compresses, 15.24 cm
- 5 sterile gauze bandages, 91.4 cm
- 1 elastic bandage, 7.5 cm x 15 cm
- 10 roller bandages, 5.1 cm x 5.5 m
- 1 roll of adhesive tape, 2.5 cm x 2.3 m
- 3 crepe bandages, 7.6 cm long
- 2 boxes of 6 antiseptic towelettes
- 12 sterile pads, 5.08 cm
- 1 nail brush
- 1 tweezers
- 3 blankets

#### SCHEDULE 2

In addition to the items required under Schedule 1, the following items shall be kept at a first aid facility referred to in section 8.48:

- 3 chemical cold packs
- 5 envelopes of skin closures, 0.6 cm x 7.5 cm
- 48 gauze pads, 7.62 cm
- 2 rolls of adhesive tape, 2.5 cm x 2.3 m
- 6 crepe bandages, 7.6 cm



- 1 antiseptic soap, 50 ml
- 1 glass eye dropper
- 2 plastic eye shields
- 1 pair of thin nose sliver forceps
- 2 packages of flexible metallic splints
- 1 small kidney basin
- 1 set of adjustable cervical collars
- 1 plywood spineboard with handholds (2 sides levelled), 44 cm x 1.8 m x 2 cm
- 7 heavy velcro straps to secure injured person, 5 cm x 1.8 m
- 2 sets of splints each including:
  - 2 splints, 1 cm x 10 cm x 1 m plywood notched and 2.5 cm padding
  - 1 splint, 1 cm x 10 cm x 1.5 m plywood notched and 2.5 cm padding
- 1 portable oxygen therapy unit (may be kept in a separate container from the other supplies)
- 1 pocket mask with a one-way valve (may accompany the portable oxygen therapy unit)
- 1 oropharyngeal airway kit (may accompany the portable oxygen therapy unit)
- 1 manually operated self-inflating bag-valve mask unit with an oxygen reservoir (may accompany the portable oxygen therapy unit)
- 1 bed
- 1 bedpan
- 6 sterile pads, 7.6 cm
- 6 bandage compresses, 5.08 cm
- 6 sterile bandages compresses, 7.6 cm
- 6 abdominal pads, 30.48 cm
- 2 Esmarch bandages, 7.62 cm
- 1 eye wash solution, 50 ml
- 1 glass footed eye bath cup
- 12 tongue depressors
- 1 burn trauma kit

### SCHEDULE 3

In addition to the items required under Schedule 1, for the purposes of section 8.50, the following items shall be kept in a container which can readily be taken to the scene of an injury:

- 1 set of adjustable cervical collars
- 1 set of splints including:
  - 2 splints, 1 cm x 10 cm x 1 m plywood notched and 2.5 cm padding
  - 1 splint, 1 cm x 10 cm x 1.5 m plywood notched and 2.5 cm padding
- 1 portable oxygen therapy unit (may be kept in a separate container from the other supplies)
- 1 oropharyngeal airway kit (may accompany the portable oxygen therapy unit)
- 1 manually operated self-inflating bag-valve mask unit with an oxygen reservoir (may accompany the portable oxygen therapy unit)
- 1 treatment record book

## SCHEDULE 4(Subsection 9.02(2))

### FORMULA FOR THRESHOLD LIMIT VALUES FOR EXTENDED WORK HOURS

For work cycles that exceed eight hour shifts or 40 hour work weeks, the concentration equivalent shall be calculated taking into account the number of hours worked per shift, the days worked and the days in the work cycle. For purposes of this calculation, the work cycle shall not be longer than 14 consecutive days worked plus days off.

The standard Threshold Limit Value (standard TLV) is based on five consecutive days of eight hour shifts followed by two consecutive days off (standard work cycle).

The standard TLV shall be used to determine the concentration equivalent as follows:

$\frac{\text{factor for standard work cycle}}{\text{factor for other work cycles}} \times \text{standard TLV} = \text{concentration equivalent}$

$\frac{\text{days worked} \times \text{shift hours/day}}{\text{total days in cycle}} = \text{factor}$

#### Example

For a standard work cycle, the factor is determined as follows:

$$\frac{5 \times 8}{5 + 2} = \frac{40}{7} = 5.7$$

For a work cycle of six days on, one day off with shifts of 12 hours, the factor is determined as follows:

$$\frac{6 \times 12}{6 + 1} = \frac{72}{7} = 10.3$$

Concentration equivalent =  $\frac{5.7 \times \text{standard TLV}}{10.3}$

## SCHEDULE 5(Section 9.19)

### NOISE EXPOSURE

1. (1) In this Schedule,
  - (a) "steady state noise" means noise in which variations of peak pressure levels occur in one second or less; and
  - (b) "impact noise" means noise in which variations of peak pressure levels occur at intervals greater than one second apart.
- (2) For purposes of Table 2, an unweighted peak measurement may be used if an instrument is not available to measure a C-weighted peak.
2. (1) No person may be exposed without hearing protection to
  - (a) steady state noise over 109 dBA;
  - (b) a maximum equivalent noise level exceeding 85 dBA for an eight hour shift, or exceeding the equivalent exposure level set out in Table 1; and
  - (c) impact noise at a peak pressure level exceeding 140 dBC, or exceeding the maximum levels set out in Table 2.

(2) Where the maximum noise level permitted in paragraph (1)(a), (b) or (c) is exceeded at a worksite, a person shall be provided with and shall use the hearing protection recommended in Table A1 of the standard CAN/CSA Z94.2-94, Hearing Protectors.

Table 1

Exposure Limits Equivalent to 85 dBA/8 Hour Shift

<b>Length of Exposure</b>	<b>Average Noise Level</b>
<b>16 hours</b>	<b>82 dBA</b>
<b>12 hours</b>	<b>83 dBA</b>
<b>10 hours</b>	<b>84 dBA</b>
<b>8 hours</b>	<b>85 dBA</b>
<b>4 hours</b>	<b>88 dBA</b>
<b>2 hours</b>	<b>91 dBA</b>
<b>1 hour</b>	<b>94 dBA</b>
<b>½ hour</b>	<b>97 dBA</b>
<b>¼ hour</b>	<b>100 dBA</b>

Table 2

Impact Noise Exposure Limits

<b>Peak Pressure Level (decibels)</b>	<b>Maximum Permitted (impulses per eight hour day)</b>
<b>120</b>	<b>10,000</b>
<b>130</b>	<b>1,000</b>
<b>140</b>	<b>100</b>
<b>greater than 140</b>	<b>0</b>

**SCHEDULE 6 (Paragraph 9.80(a))**

**MAXIMUM PERMISSIBLE DOSE OF IONIZING RADIATION**

- 1. Column II of Table 1 of Schedule II of the Atomic Energy Control Regulations (Canada), and the notes to that Schedule, apply to the determination of the maximum permissible dose of ionizing radiation that a surface or underground worker may receive in any three month period or in any year.**
- 2. Column III of Table 1 of Schedule II of the Atomic Energy Control Regulations (Canada), and the notes to that Schedule, apply to the determination of the maximum permissible dose of ionizing radiation that an office worker or other person who is not a surface or underground worker may receive in any three month period or in any year.**
- 3. This Schedule does not apply to determine the maximum permissible exposure to radon daughters. See Schedule 7 for that determination.**

## **SCHEDULE 7 (Paragraph 9.80(a))**

### **MAXIMUM PERMISSIBLE EXPOSURES TO RADON DAUGHTERS**

- 1. Column I of Table 2 of Schedule II of the Atomic Energy Control Regulations (Canada), and the notes to that Schedule, apply to the determination of the maximum permissible exposures to radon daughters for a surface or underground worker in any three month period or in any year.**
  - 2. Column II of Table 2 of Schedule II of the Atomic Energy Control Regulations (Canada), and the notes to that Schedule, apply to the determination of the maximum permissible exposures to radon daughters for an office worker or other person who is not a surface or underground worker in any three month period or in any year.**
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### **DIRECTIVES**

#### **Slushers**

**The manager shall develop a procedure, in consultation with the Committee, which addresses the following points for the safe operation of slushers:**

- (a) All slushers blocks shall be equipped with functional safety latches which would prevent the block from flying off of the eyebolt or cable bolt when put under load;**
- (b) All slushers shall be equipped with a cable back lash guard;**
- (c) When there is more than one man working in the same area, some sort of signaling system must be in place;**
- (d) Air supply or electric power source to slusher must be shut off before anyone is allowed to proceed into slusher area,**
- (e) When slusher cables are crossing a travel way, barricades must be installed 5 m on both sides of cables to prevent inadvertent access into slusher area when in operation.**

#### **Open Raises**

- (1). When raise mining is carried out by conventional mining methods, all raises inclined at over 50 degrees from the horizontal with a slope distance of greater than 20 m shall**
  - (a) be divided into two compartments, one of which will be maintained as a manway with a head cover on top during blasting;**
  - (b) be provided with landings at intervals not greater than 7 m;**
  - (c) be provided with safety staging in the muck compartment while working above the timber, other than working on extending the timber in accordance with Regulation 8.11; and**
  - (d) maintain the timbering within 10 m from the face.**
- (2). The manager shall develop, in consultation with the Committee, a procedure for raise mining under 20 m.**