

Recommendations in response to the Draft Mining Regulations proposed by the Government of Newfoundland and Labrador



**Submission on behalf of the
United Steelworkers District 6**

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The United Steelworkers would like to thank the government of Newfoundland and Labrador for the opportunity to respond to the Draft Mining Regulations. We take these regulations extremely seriously as we recognize the hazards and physical nature of work in this sector. We hope the government will consider our recommendations, which we believe will enhance the proposed regulations. Sadly, the United Steelworkers are very aware of the elevated incidence of workplace injuries, disabilities, and fatalities in the mining sector. With clear and comprehensive regulations, combined with vigilant enforcement, a reduction of the unacceptable number of workplace injuries and fatalities can be achieved.

Please accept the following recommendations:

3. Underground Illumination:

Add:

A record of cap lamp maintenance test results shall be kept.

Every worker in an underground mine shall wear retroreflective material on headgear and outer clothing.

Underground Illumination is needed, in those circumstances where the nature of the equipment or the operation may create a hazard to a worker due to insufficient lighting.

For surface mining:

Between sunset and sunrise, every worker shall wear retroreflective material on headgear and outer clothing that enables the worker to be seen.

In a workplace in a building which is solely dependent on artificial lighting and where a failure of the regular lighting system would create conditions that might endanger the safety of any person in the building, emergency lighting shall be provided which,

- (a) turns on automatically when the regular lighting fails;
- (b) is independent of the regular lighting source;

- (c) provides adequate lighting for evacuation of the building; and
- (d) shall be tested as frequently as necessary to ensure the system will function in an emergency but not less frequently than recommended by the manufacturer.

6 - 9. Conveyor Belts:

A conveyor shall be stopped and the prime mover de-energized, locked and tagged out when the conveyor is undergoing repairs, adjustments or maintenance.

10. Procedure where flow of gas underground

This section is far too vague in the Draft Regulation. There must be clear and defined procedures as to:

- how and who is to measure the concentration of gas
- evacuation plans of an affected area
- when an area would be designated a fire hazard area
- when all underground work must cease
- when all sources of ignition in the affected area must be eliminated
- when all electrical equipment in the area must be de-energized
- when and under what conditions work may resume
- what levels or concentrations of gas must precautions be taken

14. Unventilated or unsafe mine area

Add:

Before a competent person examines the affected mine area he or she shall be provided with instructions in writing setting out,

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

16. Mine Design

Add:

- describe previous occurrences of ground instability.
- A record of the occurrence of a rockburst or of an uncontrolled fall of ground at an underground mine shall be kept in writing setting out,
- the time, location and extent of the occurrence;
- injury, if any, caused to a worker thereby; and
- any other relevant information, including the records of any monitoring instruments or devices before the occurrence.

19. & 20. Record of warning of unsafe condition and Duty of supervisor on change of shift

Add:

When a potential or actual danger to the health or safety of a worker has not been remedied or removed at the end of a work shift, a record in writing shall be made by the supervisor of the work shift and signed by the supervisor describing,

- (a) the dangerous condition; and
- (b) the state of corrective measures taken.

(2) The record required by subsection (1) shall be read and countersigned by the supervisor of the next work shift before a worker on such shift does any work in the area of the dangerous condition and the workers on such shift who may be affected by the dangerous condition shall be advised of,

- (a) the dangerous condition;
- (b) the state of corrective measures undertaken; and
- (c) the work required to be done to remove or remedy the dangerous condition.

In the case of an underground mine, the employer shall, in consultation with the joint health and safety committee for the mine, shall develop a written program to provide for the timely communication of information between workers and supervisors in the mine respecting ground stability, ground movement, falls of ground, ground monitoring equipment and emergencies.

- (2) The communications program shall set out,
- (a) means and procedures for communicating information;
 - (b) the kind of information to be communicated; and

- (c) the actions to be taken by supervisors and workers with respect to information that is communicated to them.

25. Use of raise climbers

Add:

A major overhaul shall be performed on a raise climber at the frequency recommended by the manufacturer of the climber.

Have an overspeed safety device that,

- (i) will stop the climber and hold it in place if it begins to travel faster than its design speed,
- (ii) is approved by the manufacturer of the climber,
- (iii) is overhauled at least once every three years by the manufacturer or by another competent person, and
- (iv) bears a suitable mark identifying the device's serial number, the most recent date on which the device was overhauled and the name of the person who performed the overhaul.

A raise climber that is electrically powered shall,

- (a) not be operated in excess of 750 volts;
- (b) be protected by a ground fault system;
- (c) have a visible break switch at the raise service area by which its power can be isolated;
- (d) have a switch at the raise service area by which its power can be safely interrupted; and
- (e) have a control switch on the climber by which power to its motor can be removed.

(3) The electrical supply to a raise climber shall be disconnected while explosives and electric caps are being loaded into a position for blasting.

(4) A means by which workers can be reached and removed from a raise climber shall be available for use.

29. Water accumulation in mine workings

Add:

A workplace in an underground mine shall,

- (a) be **kept free from accumulations or flow of water which might endanger a worker 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.
- (2) Where accumulations of water are likely to be present,
 - (a) a borehole shall be drilled at least six metres ahead of the working face to protect against a sudden breakthrough of the water; and
 - (b) precautions shall be taken to control the flow of water.
- (3) A positive displacement water pump shall be equipped with a relief valve or system.
- (4) Precautions shall be taken to guard against an accumulation of water in a chute or raise where the material in the chute or raise may block drainage.

30. Entry Prohibited

An issue this serious can't be left to chance. Add:

The employer shall ensure that written procedures for the precautions to be taken before, during and after removal of the material are established and followed.

The written procedures required shall address the following matters:

- The conditions under which workers are required to wear a fall arrest system.
- The communication of hazards to all persons who may be at risk.
- The identification of those locations that are not safe for workers to enter.
- The need to post warning signs that indicate the nature of the danger or hazard and the need to erect barriers to prevent inadvertent access to the area.
- Any additional protection to be provided to workers required to enter or work in the area.

31. Plotting of diamond drill holes

Add:

Have the approach to the collar or to any intersection or breakthrough securely closed off or guarded,

- when mining is in progress towards the hole, and
- when blasting is to be done within five metres of an intersection of the hole;

and be shown on the plans of the mine.

32. Emergency procedure, Mine Rescue

Add:

All workers shall be trained on the emergency procedures.

Mine Rescue: A mine rescue station and the training of members of a mine rescue crew shall be under the direction of a mine rescue officer appointed by the Department of Labour.

A Mine Rescue Handbook shall be developed which would outline the requirements and details of training required in Mine Rescue and Recovery Operations. The Handbook would include:

- Structure and responsibilities
- Emergency Preparedness
- Selection & Training of Mine Rescue Personnel
- Mine Gases
- Detecting Mine Gases
- Protection from Mine Gases
- Rescue Equipment
- Emergency Practices such as Mine Rescue Guidelines, Procedures, Communications, Refuge Stations
- Underground Fires
- Surface Rescue
- Other issues as required such as Ground Control, Heat Stress, Hazard Awareness, Rescue Team Members Emotional Health, to name a few.

A mine rescue crew member shall possess such physical qualifications, and establish competency in mine rescue skills as described in the Handbook of Training in Mine Rescue and Recovery Operations.

The owner of a mine shall make available training facilities and workers to be taught and trained in mine rescue work at the expense of the owner.

A mine rescue operation at a mine shall be under the direction of the supervisor in charge of the mine and the costs of the rescue operation shall be at the expense of the owner of the mine.

Notice shall be given immediately to a mine rescue officer and to an inspector when the services of a mine rescue crew are required.

33. Tests and reports of emergency warning system

Add:

Once in at least every twelve months **during each production shift** a test of the procedures shall be conducted.

34. Emergency Exits from Underground

Add:

Exits will be made known to all underground workers who shall be instructed as to the route to the escapement exit.

Exits will be inspected at least once a month by a competent person who shall give a written report of such inspection to the supervisor in charge of the mine.

A structure covering the escapement exit shall be constructed of material with at least a one hour fire-resistance rating.

37. Air supply for hoist operators

Add:

Cagetender with hoist operator

Every hoist operator and cagetender who may be required to use demand breathing apparatus shall be competent in its use.

42. Add additional new Section: Fire procedure

Procedures in case of a fire at,

- (a) the surface of an underground mine;
- (b) a surface mine; or
- (c) a mining plant,

shall be prepared by the supervisor in charge of the mine or mining plant.

(2) The procedures required by subsection (1) or extracts therefrom shall be set out in writing and shall be posted and kept posted in a conspicuous place or places where they are most likely to come to the attention of a worker.

(3) A suitable number of workers at each mine and mining plant shall be trained in the fire-fighting procedures and,

- (a) the names of such workers shall be posted in a conspicuous place;
- (b) such workers shall be tested for proficiency at least once a year; and
- (c) a written report of the results of the tests shall be made and kept on file.

45. Fueling vehicles underground

Add:

A fuelling station in an underground mine shall,

- be designed and protected to prevent inadvertent entry of an uncontrolled motor vehicle;
- be located so that in the event of a fire or explosion in the fuelling station there will be a minimum effect on working areas of the mine or on underground installations including shafts, magazines, refuge stations, transformer installations and other installations
- provide clearance around the vehicles being fueled to permit the safe performance of all work being performed.

A fuelling station shall be established before a heading has advanced 250 metres from the ramp or shaft unless vehicles can be fuelled at another fuelling station.

A fuelling station shall be separate from a service garage.

46. Fuel transfer or delivery systems

Add:

No liquids or solids shall be transferred from one location or container to another location or container by the application of air under pressure except where equipment specifically designed for the purpose is used.

Any spillage of oil or fuel shall be taken up at once, deposited in a fireproof receptacle and removed from the mine without undue delay.

All fuel handling, transfer, storage and dispensing systems in an underground mine shall be designed according to good engineering standards and subjected to a fire safety hazard review before first use.

The employer, in consultation with the joint health and safety committee or the health and safety representative, if any, shall develop appropriate safeguards and procedures for the safe handling, transfer, storage and dispensing of fuel in an underground mine.

Add new section: process Producing Flammable Mixture:

A process that is likely to produce a gas, vapour, dust or fume to such an extent as to be capable of forming a flammable mixture with air shall be carried out in an area which,

- is isolated from other operations;
- has a system of ventilation which removes the gas, vapour, dust or fume;
- has no potential sources of ignition; and
- has vents, baffles, chokes, dampers or other means to reduce the effects of any explosion, as may be required.

Add new section: Mining Plant Flammable Material Storage:

Any dangerous, flammable or explosive material or substance in a solid, liquid or gaseous state, or any combination thereof, other than explosive, that is kept, stored or handled, in a mining plant shall,

- be kept in a container that is suitable having regard to the nature and state of the material or substance;
- have labels on the container identifying the material or substance and warning of the hazards involved therewith;
- be kept apart or insulated from any source of ignition or from temperatures likely to cause combustion; and
- where the material or substance is not intended for immediate use, be kept, stored or handled,
 - outside any building,
 - in a building not used for any other purpose, or
 - in a well ventilated fire-resistance compartment which is located in conformity with clause

Hot Work in mines

Add:

(1) Where a blow torch or welding, cutting or other hot work equipment is used underground, or in a headframe, shaft house or other surface building in which a fire may endanger the mine entrance or the underground workings, a procedure for the safe use of hot work equipment shall be **prepared in writing and signed by the supervisor in charge of the mine.**

(2) Only a worker who is a competent person or is under the direction of a competent person shall use hot work equipment.

(3) In addition to the hot work procedure required by subsection (1), written instructions shall be issued to the worker by a supervisor before the hot work equipment is used respecting,

- (a) the type of work;
- (b) the location of the work;
- (c) when the work is to be done; and
- (d) any special measures and procedures to be taken before, during and after the work.

(4) Where hot work equipment is used in a shaft, timbered area or fire hazard area,

- (a) the area adjacent to the particular workplace shall be wet down,
 - (i) before the work is begun, and
 - (ii) when the work is stopped and the worker using the hot work equipment intends to leave;
- (b) the area adjacent to the particular workplace shall be examined for potential fire hazards,
 - (i) before the work is begun, and
 - (ii) when the work is stopped and the worker intends to leave the area, and
 - (iii) on at least one other occasion approximately two hours after the work is stopped;
- (c) fire-fighting equipment suitable for extinguishing any potential fire shall be available; and
- (d) workers shall be protected from fumes, vapours or gases by,
 - (i) ventilation, or
 - (ii) the wearing of respirators.

(5) Subsection (1) does not apply to hot work being performed in a repair station or garage protected by a fire suppression system.

(6) Clause (4) (a) does not apply where the wetting down will create a hazard because of freezing or the presence of electrical equipment.

51. Mine ventilation and auxiliary ventilation systems

Add:

In a mining plant building, a ventilation system shall be provided, maintained and used, that will,

- provide a partial pressure of oxygen in the atmosphere of more than eighteen kilopascals to all workplaces therein; and
- except as provided by a regulation made in respect of a designated substance, dilute and remove contaminants from all workplaces therein to prevent exposure of a worker to contaminants.

Accurate plans and records of a mining plant building ventilation system shall be kept and maintained, showing,

- the location of all ventilation openings;
- the location of all ventilation fans;
- the volumes of air in cubic metres per second handled by the fans and openings;
- the volumes of air in cubic metres per second withdrawn by processing equipment; and
- the location and functions of all ventilation regulating doors, louvres or other devices.

Where in a mining plant the atmosphere may contain chemical or physical agents that are likely to endanger the health and safety of a worker, equipment for the detection of such agents shall be provided and such equipment shall be readily accessible.

Add:

In an underground mine, a mechanical ventilation system shall be provided, maintained and used that will,

- provide a partial pressure of oxygen of more than eighteen kilopascals; and
- except as provided by a regulation made in respect of a designated substance, dilute and remove contaminants from all workplaces therein to prevent exposure of a worker to contaminants.

Accurate plans and records of a mechanical ventilation system in an underground mine shall be kept and maintained showing,

- (a) the location of all ventilation fans;

- (b) the volumes of air in cubic metres per second handled by the ventilation fans;
- (c) the fan operating gauge pressure;
- (d) the direction of flow of main ventilating airflows;
- (e) the location and function of all fire doors; and
- (f) the location and function of all ventilation doors, brattices, stoppings and regulators controlling airflows.

In an underground mine,

- (a) a development, exploration or production workplace shall be ventilated throughout by an auxiliary ventilation system for any advance in excess of sixty metres from a mechanical mine ventilation system; and
 - (b) a continuous supply of fresh 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 metres from a mechanical mine ventilation system, to prevent exposure of a worker to contaminants.
- (2) The fresh air supply prescribed by clause (a) (b) shall be,
- (a) independent of the air supplied by any drill or machine used;
 - (b) controlled only at the beginning of the raise or sub-drift; and
 - (c) operating when a blast is detonated.

Add to 51(6):

A heating system shall be operated and maintained so as to eliminate the risk of fire or explosion.

52. Internal combustion engines underground

Add:

Gasoline or another volatile fuel shall not be used in the starting mechanism of diesel-powered equipment.

The fuel used in a diesel engine shall conform to CAN/CGSB-3 16-99 "Mining Diesel Fuel", Special-LS or CAN/CGSB-3.517 "Automotive Low Sulphur Diesel Fuel" Type AL-S.

An employer shall ensure that the undiluted exhaust gases from diesel-powered equipment is less than 1,500 parts per million by volume of carbon monoxide.

For each piece of diesel-powered equipment, the employer shall ensure that a record containing the following information is maintained:

1. The company identification number.
2. The make and model of the piece of equipment.
3. The prescribed ventilation rate in cubic metres per second.
4. The maximum rated load in kilowatts.
5. The maximum speed at the maximum rated load in revolutions per minute.
6. The maximum fuel injection rate at the maximum rated load and speed in kilograms per hour.
7. The results of any test made under this section.

An employer shall maintain a chart of procedures for the use and operation of diesel-powered equipment that sets out,

- (a) the actual volume of air flowing in the underground haulageways and workings where the equipment is operating; and
- (b) the total ventilation requirements for the equipment when it is operating normally in a single continuous course of air.

The employer shall post the chart in a location where it is clearly visible and readily accessible to the operator of the diesel-powered equipment.

The employer shall ensure that a flow of air that meets the requirements of this section is provided to the workplace where diesel-powered equipment is operating.

The flow of air must be provided by a mechanical ventilation system.

The flow of air must be at least 0.06 cubic metres per second for each kilowatt of power of the diesel-powered equipment operating in the workplace.

The flow of air must reduce the concentration of toxic substances in diesel exhaust emissions to prevent exposure of a worker to a level of no more than the limits prescribed.

The flow of air must reduce the time-weighted average exposure of a worker to airborne respirable combustible dust to not more than 1.5 milligrams per cubic metre of air.

The employer shall ensure that tests are conducted to determine the following matters at the times indicated:

1. The volume of air flowing in underground haulageways and workings where diesel-powered equipment is operating. This must be tested at least weekly.
2. The carbon monoxide content of the undiluted exhaust discharging from diesel-powered equipment to the atmosphere. This must be tested,
 - i. immediately after repairs are made to the engine or the exhaust system or both, and
 - ii. at routine intervals for maintenance as the manufacturer recommends or, if there is no such recommendation, at least once a month.
3. The volume of air flow and the carbon monoxide, nitrogen dioxide, formaldehyde or respirable combustible dust contents of the atmosphere. These must be tested at the request of a worker.

The employer shall provide the results of every test conducted under this section to the joint health and safety committee or the health and safety representative, if any, for the workplace.

The employer shall record the results of every test conducted under this section and shall maintain the record.

If a test indicates that a worker has been exposed to diesel exhaust emissions containing a toxic substance in excess of the prescribed limit and if this test result could not have been predicted in the circumstances, the employer shall,

- (a) investigate the cause and take remedial action, if possible, to prevent a recurrence of the situation;**
- (b) notify the worker and the joint health and safety committee or the health and safety representative, if any, for the workplace; and**
- (c) conduct tests of the emissions until the results show that the concentration of the toxic substance does not exceed the prescribed limit level.**

The exhaust of an internal combustion engine which is temporarily or permanently installed within a building on surface shall be,

- (a) conducted to a point outside the building; and
- (b) prevented from,
 - (i) re-entering the building,
 - (ii) entering the intake of any compressor,
 - (iii) contaminating the atmosphere of another building, and

(iv) contaminating mine workings.

55. Operation vehicles

Add:

Vehicles being used for transporting workers shall,

- (a) be provided with suitable seats or other facilities;
- (b) be limited to a maximum number of passengers, which number shall be posted in or on the vehicle; and
- (c) when enclosed, be equipped with an emergency exit.

Except for training purposes, only those workers authorized and required to handle the load shall ride on a vehicle that is transporting,

- (a) explosives;
- (b) steel or timber; or
- (c) heavy equipment

The load on a vehicle shall be adequately secured.

A worker may carry personal hand tools or equipment on a vehicle when,

- (a) the vehicle is not crowded;
- (b) the tools and equipment are properly protected by guards; or
- (c) the tools or equipment are isolated in separate containers.

The maximum speed and the maximum load of a vehicle transporting workers or a service vehicle shall be posted on the vehicle in a conspicuous location.

Where the operator may be exposed to overhead hazards on surface at a mine or mining plant, a cab, screen or other adequate overhead protection shall be provided on,

- (a) a power-driven crane, shovel or similar machine;
- (b) a fork-lift truck; and
- (c) a front-end loader or other excavating machine.

When material is dumped from a vehicle that is occupied by a person, the dump point shall include features designed to prevent the vehicle from going over a bank, over a bench or into a raise or other open hole.

In an underground mine, the designed features referred to above shall not include the use of a ridge of material.

56. Remote controlled equipment

Add:

The system, device or controller must be equipped with a device that enables the operator to stop the equipment in an emergency.

61. Operation of mobile equipment on ramps

Add:

The brake system on a motor vehicle that is operated on a grade, slope or ramp shall be able to perform the individual system function requirements of,

- (a) a service brake system;
- (b) an emergency brake system; and
- (c) a parking brake system.

(3) The capacity of retarders shall not be considered in determining the capacity of the brake systems described in clauses (2) (a), (b) and (c).

(4) Any combination of the system function requirements described in clauses (2) (a), (b) and (c) may be performed by a single brake system.

(5) Each brake system shall be capable of being,

- (a) tested independently; and
- (b) readily applied by a worker seated in the driver's seat.

(6) A service brake system may consist of a hydraulic pump motor drive system.

(7) The service brake system and the emergency brake system shall be capable of safely stopping the motor vehicle while it is being operated,

- (a) on the maximum grade, slope or ramp in its area of operation;
- (b) at its maximum authorized speed; and
- (c) with its maximum authorized load.

(8) The parking brake system shall be capable of holding the motor vehicle stationary, with its maximum authorized load, on the maximum grade, slope or ramp in its area of operation.

(9) The emergency brake system shall be set up so that, whether the brake is applied automatically or manually, a deliberate act is required to release it.

(10) Before a motor vehicle is first put into service, the following systems shall be tested by a competent person for proper operation:

- 1. Service brake.

2. Emergency brake.
3. Parking brake.
4. Steering.
5. Warning devices.
6. Lighting.

(11) A record of the tests described in subsection (10),

- (a) shall be signed by the competent person who performed the tests;
- (b) shall be kept as long as the motor vehicle is in service; and
- (c) shall be made available to the joint health and safety committee or the health and safety representative, if any.

Where a motor vehicle is operated on a grade or ramp, traffic control procedures shall be established including provision for the control of emergency situations.

Where a motor vehicle is disabled or parked in the travelled portion of a roadway, a warning to approaching traffic shall be provided by,

- (a) flashing lights;
- (b) flares;
- (c) reflectors;
- (d) lamps; or
- (e) a worker suitably equipped to be readily seen, who directs traffic approaching the area.

In the operation of a motor vehicle in an underground mine,

- (a) the maximum load to be carried;
- (b) the maximum speed; and
- (c) the gear selection to be used,

on a grade or ramp shall be established and made known to the operator by the supervisor in charge of the mine.

Before ascending or descending a main access ramp in an underground mine, the operator of a motor vehicle shall,

- (a) fully engage the forward-reverse lever;
- (b) select the proper gear; and
- (c) test the service and emergency brakes.

A motor vehicle in a mine shall be equipped with wheel chocks that comply with Society of Automotive Engineers Standard SAE J348 JUN90 "Wheel Chocks".

The wheel chocks shall be used to block movement whenever the vehicle,

- (a) is left unattended on a slope; or
- (b) is being maintained or repaired.

Add new section:

The brake system of a rubber-tired motor vehicle used in an underground mine shall meet the requirements of CAN/CSA-M424.3-M90, “Braking Performance — Rubber-Tired, Self-Propelled Underground Mining Machines”.

(2) The brake system of a rubber-tired motor vehicle used in a surface mine shall meet the requirements of CSA-M3450-03, “Braking systems of rubber-tired machines — Performance requirements and test procedures”.

(3) The brake system of a tracked motor vehicle used in an underground mine or in a surface mine shall meet the requirements of ISO 10265: 1998 “Earth-moving machinery — Crawler Machines — Performance requirements and test procedures for braking systems”.

Motor vehicles, other than vehicles operating on rails, that are,

- (a) equipped with a stored energy brake system that uses a pneumatic system or a full hydraulic system to apply the service brakes.

(2) For the purposes of this section, the critical level of pressure is the level of pressure in a motor vehicle’s stored energy brake system, torque converter or transmission below which the manufacturer has determined that the vehicle is unsafe to operate.

(3) A motor vehicle that is operated on the surface must be equipped with a device that warns the operator that the vehicle’s stored energy brake system is approaching the critical level of pressure, so that the vehicle can be safely stopped.

(4) A motor vehicle that is operated underground must be equipped with,

- (a) a device that automatically applies the emergency brake system and stops the vehicle before the vehicle’s stored energy brake system, torque converter or transmission pressure reaches the critical level of pressure; and
- (b) a device that warns the operator that the emergency brake system is about to be applied.

Add new section: Roll-Over Protective structures

In this section:

1. “machine” means a self-propelled vehicle, operated by one or more persons who ride on or in it, that is a tractor, bulldozer, scraper, front-end loader, skidder, dumper, grader or compactor other than an asphalt compactor;

“restraining device” means a seat belt with or without an over-the-shoulder strap;

“roll-over protective structure”, in relation to a machine, means a structure that protects every operator of the machine who is wearing a restraining device from being crushed if the machine rolls over.

2. This section does not apply in respect of a machine,

(a) that is rated by its manufacturer at fifteen kilowatts or less and has a tare mass of 700 kilograms or less;

(b) that was manufactured before 1980 and is not factory-equipped with adaptors to accept a roll-over protective structure; or

(c) that is used primarily underground in a mine.

3. (1) No person shall use or operate a machine unless it is equipped with a roll-over protective structure that meets the requirements of subsection 5 (1) and a restraining device that meets the requirements of section 6 for every operator of the machine.

(2) No person shall use or operate a machine that is equipped with a restraining device unless the person is wearing the restraining device.

4. Despite subsection 3 (1), a restraining device is not required on a skidder that is used in logging.

5. (1) Every roll-over protective structure,

(a) shall be designed, constructed and maintained so that, when the machine to which it is fastened is travelling at a forward speed of 16 kilometres per hour, engages a thirty degree slope and rolls 360 degrees about its longitudinal axis on a hard clay surface,

(i) the roll-over protective structure will withstand the impact forces,

(ii) upon impact, no part of the roll-over protective structure will enter the space of the machine that is normally occupied by its operator, and

(iii) the roll-over protective structure will support the machine in an upside-down attitude without any part of the roll-over protective structure entering the space of the machine that is normally occupied by its operator;

(b) shall bear a legible label indicating,

- (i) the name and address of the manufacturer of the roll-over protective structure or, if it is custom built, the name and address of the professional engineer referred to in subsection (2), and
 - (ii) the make, model and maximum mass of the machine that the roll-over protective structure is designed to fit;
- (c) shall be securely fastened to the frame of the machine; and
- (d) shall be capable of withstanding all forces to which it is likely to be subjected.

(2) Every custom built roll-over protective structure, every repair to such a structure and every custom built modification to a roll-over protective structure shall be certified as meeting the requirements of clause (1) (a) by a professional engineer who is registered or licensed.

(3) Every repair to a roll-over protective structure other than a custom built structure shall be approved by the manufacturer

6. Every restraining device shall be designed, constructed, installed and maintained,

- (a) so that the person using the device is secured in position and within the space protected by the roll-over protective structure if the machine to which it is fastened is travelling at a forward speed of 16 kilometres per hour, engages a thirty degree slope and rolls 360 degrees about its longitudinal axis on a hard clay surface; and
- (b) so as to minimize injury to the person using the device, in case of an accident.

64. Placement of fill material in mine workings

Add:

The assessment shall be done in consultation with the joint health and safety committee or the health and safety representative.

68. Shaft requirements

Add:

No person shall be transported in a shaft conveyance,

- (a) that is a cage, unless the cage doors are closed;
- (b) while the hoist that is raising or lowering the shaft conveyance is being used to transport ore or waste;

- (c) that is a multi-deck cage, where supplies or service rolling stock are being transported, except that persons may be carried on the top deck when,
 - (i) such materials are carried on another deck,
 - (ii) the materials are adequately secured,
 - (iii) the doors of the top deck are closed,
 - (iv) the combined load does not exceed 85 per cent of the material load limit of the conveyance, and
 - (v) the scheduled trips for persons have been completed;
- (d) where personal hand tools or equipment are being transported, unless such tools or equipment are,
 - (i) protected by guards,
 - (ii) secured, and
 - (iii) the combined load does not exceed 85 per cent of the material load limit of the conveyance;
- (e) unless a worker authorized to give signals is in charge of the conveyance; and
- (f) with explosives, supplies or service rolling stock.

(2) Despite clause (1) (f), those workers required to handle explosives, supplies or service rolling stock may be transported with the explosives, supplies or service rolling stock if space is provided for the safety of the workers and the combined load does not exceed 85 per cent of the material load limit of the conveyance.

Where a mine shaft exceeds 100 metres in vertical depth, a shaft conveyance shall be provided for the raising and lowering of workers.

74. Construction of cages and skips

Add:

Have ventilation, adequate for the persons being transported.

Add specific language relating to skip design and use.

75. Free Fall tests

Add:

The cage or skip must travel at a speed equal to,

- i. the normal hoisting speed when transporting persons, or
- ii. the speed attained by a free fall of 1.5 metres.

The guides on which the test is made must be of the same specifications as those in the shaft in which the conveyance will operate.

A free fall test shall not be performed at the speed attained by a free fall of 1.5 metres unless the design and configuration of the safety dogs and loading on the cage or skip have been tested at normal hoisting speed before the free fall test.

If a free fall test is to be performed at the speed attained by a free fall of 1.5 metres, the person performing the test shall record the rate of deceleration and the rate of change in deceleration of the cage or skip on a chart suitable for determining the deceleration of the conveyance.

A free fall test shall be successfully passed if,

- (a) the skip or cage decelerates to a stop at an average rate that is not less than nine or greater than 20 metres per second per second.
- (b) there is no damage to the safety dogs and mechanisms;
- (c) the safety dogs engage the guides continuously during deceleration;
and
- (d) a calculation shows that the safety dogs will stop the cage or skip when it is carrying its maximum material load.

78. Chairing devices

Add:

So arranged as not to distort the cage.

Chairs fastened to shaft station posts shall be of a chain type.

79. Hoisting persons

Add:

A skip used to transport workers in a shaft shall meet the following requirements:

1. The skip must have the safety catches and mechanisms if the skip is supported by only a single rope or attachment point.
2. The skip must provide an enclosure at least 1.07 metres high for the persons being transported.
3. The skip must have ventilation that is adequate for the persons being transported.
4. The skip must have a suitable floor that is adequately fastened.

5. The skip must have a means for safe entry and exit.

The openings between a shaft and a skip box over which persons must pass to enter or leave a skip shall be closed off sufficiently to prevent a person from falling through the opening.

80. Shaft Conveyances

Add:

Every cagetender or skiptender who may be required to use demand breathing apparatus shall be competent in its use.

84. Shaft requirements

Add:

A mine shaft shall,

1. (a) be designed in accordance with good engineering practice;
 - (b) have a means to guide each shaft conveyance to prevent contact with another shaft conveyance or shaft furnishings;
 - (c) have underwind clearances that exceed the stopping distance of the shaft conveyance when travelling at the maximum speed permitted by the hoist-controls, except,
 - (i) during shaft sinking, or
 - (ii) when chairs are used to land a skip during loading; and
 - (d) where a friction hoist is installed, have tapered guides or other such devices above and below the limits of regular travel of the shaft conveyance and counterweight, arranged to act as a direct physical brake to decelerate and stop the counterweight and shaft conveyance in the event of an over-travel.
- (2) A barrier or obstruction to prevent a shaft conveyance from being lowered into water in the shaft bottom must be installed in the shaft except,
- (a) when the shaft is being sunk; or
 - (b) where a friction hoist is installed.
- (3) A probe indicating the high water level shall be installed below the lowest working level in a shaft in which natural drainage is not provided and in which flooding may occur due to equipment failure.
- (4) The probe shall be installed so that it can be read by the person in control of the hoist.

- (5) The probe shall be installed so that,
 - (a) it enables the person in control of the hoist to prevent a shaft conveyance from being lowered into water; or
 - (b) it prevents a shaft conveyance from being lowered into water.
- (6) If a probe is installed, a procedure must be established to prevent a conveyance with occupants from being lowered into water.
- (7) The employer shall establish the procedure in consultation with the joint health and safety committee.
- (8) The procedure shall be implemented when the probe indicates that there is water at the high water level.

Protective devices and procedures shall be used to prevent a shaft conveyance or counterweight from coming into contact with an intermediate shaft obstruction.

A device which may become an intermediate shaft obstruction shall be positively locked out of the shaft compartment to prevent inadvertent entry into the compartment.

The location of the intermediate shaft obstruction shall be marked on the depth indicator of a hoist.

The protective procedure for operating the intermediate shaft obstruction shall be prepared in writing and posted for use by the hoist operator.

Doors for covering the shaft at the collar to facilitate the maintenance of a shaft conveyance are not an intermediate shaft obstruction if,

- (a) they 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.

Equipment used to directly discharge material into a skip shall operate in such a way that actuating power is required before any gate will open.

This section applies if a shaft conveyance is being used to transport persons:

The hoist shall be equipped with control devices that prevent the shaft conveyance from being taken,

- (a) to the dump position, unless a procedure is established and followed that ensures persons on the shaft conveyance remain securely in place if the conveyance is taken to the dump position; or
- (b) below a loading pocket, unless the controls for loading the shaft conveyance from that pocket have been made inoperative or the persons are being transported in a separate compartment of the shaft.

(3) If a shaft conveyance that is being used to transport persons is not a cage or a combination skip and cage designed to normally transport persons, the hoist shall not be permitted to travel at a speed that is more than the lesser of,

- (a) one-half the normal speed of the hoist; or
- (b) five metres per second.

(4) The control devices of the hoist shall be designed and installed to be fail safe.

(5) An audible or visible signal that the control devices for the hoist are set in operation shall be given to persons entering the shaft conveyance.

85. Riding in bucket

Omit 85. (d)(ii)

Add:

Where the health and safety of workers is likely to be endangered.

86. Load in sinking bucket

Add:

Dump doors shall be installed and maintained that,

- (a) prevent a bucket from being dumped when the dump doors are open;
- (b) prevent any material from falling down the shaft while the bucket is being dumped; and
- (c) are provided with devices that securely latch the dump doors out of the shaft compartment automatically.

Add new section:

When work or an examination is taking place in the compartment of a shaft or in that part of the headframe used in conjunction therewith,

- (a) hoisting operations in that compartment, except for those necessary to perform the work or examination, shall be suspended;
- (b) protection from accidental contact with any moving shaft conveyance or counterweight, or falling objects shall be provided for a worker performing the work or examination; and
- (c) the power supply to all conveyor belts, gates and other devices that are located above a worker and that could cause material to flow into the

shaft shall be locked and tagged in the safe position and the gates shall be mechanically secured in the closed position.

Before the commencement of work or of an examination below a loading pocket in a shaft, a competent person who is authorized by the employer to proceed, and who proceeds, below the loading pocket shall inspect it to ensure that the work or examination can proceed safely.

92. Examination of mechanical parts

Add:

One or more competent persons shall be appointed to examine the following parts of an electrically-powered or electrically-controlled hoist:

1. Hoist motors.
2. Hoist controls.
3. Electrical safety devices.
4. Signalling devices.

(2) The examination shall be done at least once each week when the hoist is being used.

(2.1) If the parts were not examined during the week before the hoist is to be used, the examination shall be done immediately before it is used.

(3) A record of the examination, servicing and repair shall be made in the Electrical Hoisting Equipment Record Book.

(4) The entries in the Electrical Hoisting Equipment Record Book shall be dated and signed by the person performing the examination, servicing or repairs.

(5) A record of a failure or accident involving an electrical component of a hoist motor and controls, electrical safety and signalling devices shall be made in the Electrical Hoisting Equipment Record Book by the supervisor in charge of electrical hoisting equipment.

(6) The supervisor in charge of the mine hoisting plant shall,

- (a) review the entries made in the Electrical Hoisting Equipment Record Book within one week after each entry is made;
- (b) ascertain that the examinations required by this section and all necessary work have been done; and
- (c) upon completion of each review required by clause (a), certify in the Electrical Hoisting Equipment Record Book that he or she has complied with clauses (a) and (b).

A competent person or persons shall be appointed to examine the mechanical parts of a mine hoisting plant in accordance with subsections (2), (2.1) and (2.2).

(2) An examination shall be made,

- (a) immediately before the hoisting plant is used if it was not examined the previous day, and at least once each day thereafter that it is in use,
 - (i) of the exterior of each hoisting and tail rope to detect the presence of kinks or other damage and to note the appearance of the rope dressing, and
 - (ii) of the safety catches of the shaft conveyance for any defects;
- (b) if the hoist is being used, at least once every month of,
 - (i) the shaft ropes to determine,
 - (A) the amount of wear, distortion and corrosion,
 - (B) the need for lubrication,
 - (C) the need for changing the wear patterns,
 - (ii) the hoisting ropes for the number and location of broken wires, and
 - (iii) the friction treads of a friction hoist;
- (c) at least once every six months of service of,
 - (i) the hoisting rope of a drum hoist within the attachments at the drum and at the drum sprout, and
 - (ii) the hoisting rope of a friction hoist within attachments at the shaft conveyance or counterweight in accordance with an established procedure; and
- (d) at least once every twelve months of,
 - (i) bolt locking devices, foundation bolts and all bolts critical to hoist safety, and
 - (ii) the bails, suspension gear and structure of the shaft conveyance and counterweight.

(2.0.1) If any of the equipment described in clause (d) was not examined in accordance with that clause during the month before the hoist is to be used, the examination shall be done immediately before the hoist is to be used.

(2.1) The following parts shall be examined at least once a week when they are in use:

1. Any conveyance safety mechanisms for proper adjustment and freedom of movement.

2. Any head, deflection or idler sheaves, their shafting and bearer and sole plates.
3. The attachments of each shaft rope.
4. The attachments on any shaft conveyance or counterweight.
5. Any shaft conveyance, counterweight and work platform.
6. The hoist parts, brakes, clutch, brake-clutch interlocks and depth indicators.
7. Any hoisting equipment being used for shaft sinking.
8. Any auxiliary brake operating weights, to assure their freedom of movement and holding capacity.

(2.2) If the parts listed in subsection (2.1) were not examined during the week before they are to be used, the examination shall be done immediately before they are used.

(2.3) An examination of the clutch and brake-clutch interlocks under subsection (2.1) shall include an operational check to ensure their performance.

(3) At least once every three months, the safety catches and mechanisms of the cage or other shaft conveyance shall be tested and such tests shall consist of releasing the empty conveyance suddenly in some suitable manner from rest, so that the safety catches have the opportunity to grip the guides and, where the safety catches do not act satisfactorily, the cage or other shaft conveyance shall not be used for lowering or raising workers until the safety catches have been repaired and tested and shown to act satisfactorily.

(4) Hoisting ropes in use on a drum hoist shall be cleaned when necessary and shall be dressed with lubricant at least once each month so as to maintain a good coating and a record of the cleaning and dressing shall be entered in the Hoisting Machinery Record Book and the entry shall be dated and signed by the supervisor in charge of the work.

(5) After every eighteen months of service on a friction hoist, the portion of the hoisting rope and tail rope that is within the wedge and socket attachments shall be cut off unless that portion of the rope is visually examined and it is found that,

- (a) there are no broken wires;
- (b) there is no advanced corrosion;
- (c) there is no excessive pitting; and
- (d) there is no excessive deformation of wires.

(6) An examination shall be made by a competent person, using non-destructive methods acceptable to a professional engineer, to determine the condition of the,

- (a) mine hoist shafting, brake pins and linkages; and
- (b) structural parts, attachment pins and draw bars of a shaft conveyance and counterweight.

(6.1) The examination shall be made before the parts are first used and at regular intervals that are no greater than those recommended by the competent person performing the examination.

(7) Drawings of the parts to be examined under subsection (6) shall be made available, upon request, to the person performing the examination.

(8) A record of the examinations 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.

(9) A record of a failure and accident involving a mechanical part of a mine hoisting plant shall be made in the Hoisting Machinery Record Book by the supervisor in charge of the mechanical hoisting equipment.

(10) The supervisor in charge of the mechanical parts of the mine hoisting plant shall countersign each entry made in the Hoisting Machinery Record Book with respect to examinations made under subsection (6).

(11) The supervisor in charge of the mine hoisting plant shall,

- (a) review the entries made in the Hoisting Machinery Record Book within one week after each entry is made;
- (b) ascertain that the examinations required by this section have been made and all necessary work done; and
- (c) upon completion of the review required by clause (a), certify in the Hoisting Machinery Record Book that he or she has complied with clauses (a) and (b).

Explosives in Mines – PART XXVIII.5

Add:

Explosives kept or stored on the surface shall be kept or stored in compliance with the *Explosives Act* (Canada) and the regulations under that Act. O. Reg. 272/97, s. 20.

If a magazine is required, it shall be,

- (a) constructed in conformity with “Storage Standards for Industrial Explosives, May 2001” published by the Explosives Regulatory Division of the Department of Natural Resources (Canada);

- (b) located in conformity with the User Manual, Quantity Distance Tables published by the Explosives Branch of the Department of Natural Resources (Canada); and
- (c) protected by a fire break.

A copy of the notification given to an inspector under subsection (4) shall be posted in the magazine.

An operator of a surface magazine or a mine using explosives shall give written notice to an inspector and the joint health and safety committee or health and safety representative, if any,

- (a) before a magazine is or explosives are first used; and
- (b) annually after the magazine is or explosives are first used.

The notice shall contain the following information:

1. The address of the operator.
2. Specific location of any surface magazine or a statement that the explosives are delivered directly to the underground workings.
3. The Premise Project Identification Number.
4. The nature and quantity of explosives to be stored or delivered.
5. A statement that any surface magazine conforms to this Regulation and to the *Explosives Act* (Canada) and the regulations under that Act.

Explosives in an underground mine shall be kept or stored in a magazine but where less than 160 kilograms of explosives are kept or stored in the underground mine they may be kept or stored in suitable storage containers at locations removed from drilling and blasting operations.

If the necessary supply of explosives exceeds five working days, the explosives shall be kept or stored in a magazine.

The employer shall ensure that suitable plans and specifications showing the following are prepared, kept up to date and kept readily available at the mine site:

1. The design and location of magazines.
2. The design and location of explosive storage areas other than magazines.
3. The maximum explosive storage capacity at each magazine and at each explosive storage area that is not a magazine.

The employer shall, in consultation with the joint health and safety committee or the health and safety representative, if any, establish a procedure for,

- (a) identifying the location of explosives that are being kept in explosive storage areas other than magazines; and
- (b) ensuring that they are recorded under subsection (3).

(5) Despite subsection (1), where long hole blasts or similar blasting operations are being carried on in an underground mine, such quantities of explosives as can be loaded in a twenty-four hour period together with an amount that may be necessary to maintain that supply may be kept in a suitable storage area that is not a magazine.

A magazine, storage container or explosive storage area that is in an underground mine shall be,

- (a) located at least 60 metres from,
 - (i) the main access into or from a mine,
 - (ii) key mechanical and electrical installations that remain in service during a mine emergency,
 - (iii) areas of refuge or other areas where workers may congregate, and
 - (iv) storage areas for fuels or other potential sources of fire;
- (b) located and designed to protect explosives from vehicle impact or vehicle fires; and
- (c) conspicuously marked by a “DANGER EXPLOSIVES” sign.

(a) (i) does not apply during the initial stages of exploration and development of a mine.

A magazine in an underground mine shall be under the control and direction of a competent person.

A weekly inspection of a magazine in an underground mine shall be carried out by a competent person who shall report in writing to a supervisor,

- (a) as to the condition of the magazine and the explosives; and
- (b) as to the quantities of explosives stored therein.

Reports required by subsection (2) shall be kept for a period of at least six months.

Every magazine and every storage container shall be kept clean, dry and free from grit at all times.

The floors and shelves of a magazine where nitroglycerine explosives are kept shall be treated with a neutralizing agent to remove any traces of nitroglycerine.

When explosive is issued or removed from a magazine, the explosive longest in the magazine, if not defective, shall be used first.

Explosive that is damaged shall be disposed of in accordance with the following rules:

1. The employer shall establish, in consultation with the joint health and safety committee or the health and safety representative, if any, a procedure for safely disposing of damaged explosive.
2. The procedure shall state,
 - i. what maximum accumulation of damaged explosive is permitted in a magazine or storage place before the damaged explosive must be disposed of,
 - ii. what means of disposal shall be used, and
 - iii. how frequently damaged explosive shall be disposed of, in addition to disposal under subparagraph i.

Explosive that is unattended shall not be left in or about any working place but shall be returned to storage.

Detonators and capped fuse shall be stored in a separate, suitable, closed storage container located at least eight metres from any other explosive.

Explosive shall not be heated above the ambient temperature of its storage place.

All electrical equipment and wiring installed or used in a magazine or in an explosives storage area that is not a magazine,

- (a) shall comply with,
 - (i) the requirements of the current Electrical Safety Code with respect to Class II, Division 2 hazardous locations, and
 - (ii) "Storage Standards for Industrial Explosives, May 2001", published by the Explosives Regulatory Division of the Department of Natural Resources (Canada); and
- (b) shall be protected against lightning strikes and electrical surges.

A motor vehicle when transporting explosives on the surface at a mine or plant shall,

- (a) be kept in sound mechanical condition;
- (b) be conspicuously marked by red signals or flags easily visible from front, rear and both sides;

- (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 being transported;
- (e) be equipped with a type BC fire extinguisher;
- (f) not be loaded in excess 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) in a suitable container in a separated compartment, and
 - (ii) 5,000 or less in number;
- (i) be attended at all times; and
- (j) carry only those persons necessary for handling explosives.

Except as provided for in subsection (2), explosives transported at a mine shall,

- (a) be in suitable closed containers;
- (b) have detonators, blasting caps and capped fuses kept separate from other explosives.

(2) Capped fuses may be transported with other explosives without placing them in a container if they are kept separate from other explosives.

(3) Primers shall be made up,

- (a) as near to their point of use as is practicable; and
- (b) only in sufficient numbers for the immediate work in hand.

(4) Made-up primers shall be transported,

- (a) in separate, suitable, closed containers conspicuously marked with the words "DANGER — EXPLOSIVES"; and
- (b) in a separate vehicle or conveyance from other explosives.

When transporting explosives in a shaft conveyance the worker in charge of the operation shall give or cause to be given notice of the operation to the deck attendant and hoist operator.

No worker shall,

- (a) place in;
- (b) have while in; or

(c) take out of,

a shaft conveyance any explosive except under the immediate supervision of a worker authorized for the purpose by a supervisor.

No other material shall be transported with explosives in a shaft conveyance.

Explosives shall be removed without delay from,

- (a) near the shaft collar;
- (b) other entrances to the underground workings; and
- (c) a shaft station.

Explosives underground shall be transported from a magazine to other magazines or place of use,

- (a) without delay; and
- (b) by the most direct and safe route.

Where explosives are transported underground by means of a motor vehicle or a train,

- (a) the speed of the vehicle or train shall not exceed ten kilometres per hour;
- (b) specific arrangements for the right of way of the vehicle or train shall be made before the vehicle or train is put in motion;
- (c) the explosives shall be in suitable containers;
- (d) the requirements prescribed by section 131, except clauses (b) and (c), apply with necessary modifications; and
- (e) the motor vehicle or train shall display and operate a flashing red light whenever explosives are being transported.

Where explosives are transported underground by means of a train,

- (a) the motor vehicle running on rails shall be maintained on the forward end of the train unless a worker walks in front of the train to effectively guard it;
- (b) a car carrying explosives shall be separated from the motor vehicle by an empty car or spacer of equivalent length;
- (c) no explosives shall be carried on the motor vehicle; and
- (d) every car carrying explosives shall be protected from contact with a trolley wire.

In this section,

- (1) “bulk explosives vehicle” means a motor vehicle that is used to transport bulk explosives underground.
- (2) A bulk explosives vehicle shall be provided with a fire suppression system that uses sprinklers, foam or some other suitable means of suppressing fire.
- (3) Whenever a bulk explosives vehicle is not in use, it shall be parked in a place designated as a safe parking place by the employer.
- (4) A place may be designated as a safe parking place for the purpose of subsection (3) only if it is located at least 60 metres away from,
 - (a) the main access into or from a mine;
 - (b) key mechanical and electrical installations that remain in service during a mine emergency;
 - (c) areas of refuge or other areas where workers may congregate; and
 - (d) storage areas for fuel or other potential sources of fire.
- (5) Plans and specifications showing the design and location of the designated safe parking places shall be kept readily available at the mine site.
- (6) Subsections (3), (4) and (5) do not apply during the initial stages of development and exploration in a mine.
- (7) A bulk explosives vehicle shall not be parked in a magazine.
- (8) The employer shall, in consultation with the joint health and safety committee or health and safety representative, if any, develop a procedure for the regular power washing of bulk explosives vehicles.
- (9) Without limiting the generality of subsection (8), the procedure shall specify how often washing is to take place.
- (10) Before a bulk explosives vehicle enters a garage for maintenance,
 - (a) all explosives, detonators and explosive residue shall be removed from the vehicle; and
 - (b) the vehicle shall undergo power washing in accordance with the procedure mentioned in subsection (8).

Detonators being transported otherwise than by means of a motor vehicle or train:

- (2) Detonators shall be carried in containers that are,
 - (a) suitable for the purpose; and
 - (b) clearly marked as containing detonators.

(3) The employer shall make containers that comply with subsection (2) readily available to workers.

108. Electric blasting

Add:

When blasting by means of electricity,

- (a) where balanced circuits are required, each circuit shall be tested before firing with a suitable galvanometer or other similar suitable instrument;
- (b) where electric blasting caps 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 to less than one metre,
 - (iii) the firing cables leading to the face or faces shall be short-circuited while the leads from the blasting caps are being connected to each other and to the firing cables,
 - (iv) the short-circuit prescribed in subclause (iii) shall not be removed until all workers have left the workplaces to be affected by the blasting operation, and
 - (v) the short-circuit prescribed in subclause (iii) shall be located so that a premature explosion will be harmless to the worker opening the short-circuit; and
- (c) before any person returns to the workplace 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.

Where the source of current is a portable direct current battery or blasting machine the firing cables or wires shall,

- (a) not be connected to the source of current until,
 - (i) the workplace to be affected by the blasting operation has been cleared of persons, and
 - (ii) immediately prior to blasting; and
- (b) be disconnected and short-circuited immediately after the blast has been fired.

A blasting machine shall,

- (a) be of a type and design specifically manufactured for the purpose;
- (b) be kept in good mechanical and electrical condition;
- (c) be tested regularly using methods specified by the manufacturer;
- (d) be tested before any blasts that may require the maximum output of the machine;
- (e) be clearly marked with the capacity of the machine; and
- (f) not be used in excess of its rated capacity.

Blasting cables and blasting wires shall,

- (a) be distinguished from other cables and wires;
- (b) be used for blasting purposes only; and
- (c) not come into contact with,
 - (i) detonating cords,
 - (ii) power, lighting or communication cables, or
 - (iii) pipes, rails or other continuous metal grounded circuits.

When a common electrical source is used to fire blasts in more than one workplace provision shall be made for,

- (a) the continued shorting of the blasting cables;
- (b) a three-way switch for each individual blasting circuit which can be locked in either the shorted or closed position to provide for,
 - (i) shorting of the circuit,
 - (ii) energizing the circuit, and
 - (iii) testing of the circuit;
- (c) identification of blasting cables and switches; and
- (d) a written blasting procedure setting forth,
 - (i) the method of connecting the blasting wires to the electrical supply,
 - (ii) the evacuation of all workers from the area of the blast, and
 - (iii) the method of testing the system to ensure that the proper connections have been made.

The written blasting procedure shall be followed.

Circuits from a source other than from a portable hand-operated device used for blasting shall be,

- (a) from an isolated, ungrounded power source; and
- (b) used for blasting only.

A blasting device shall,

- (a) be designed for the purpose;
- (b) be kept in good mechanical and electrical 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 worker doing 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) where the power source exceeds 300 volts be electromagnetically operated. R

No electrical blasting circuit connections shall be made on or near to surface or in or near to a shaft during an electrical storm in the vicinity.

If electrical blasting operations are undertaken, an employer shall ensure that the operations are conducted so as to ensure that there is no interference from any system, device or controller capable of producing radio frequencies or radiating electromagnetic energy.

An employer shall ensure that a system, device or controller that is capable of producing radio frequencies or radiating electromagnetic energy does not set off detonators.

- (4) Subsections (1), (2) and (3) do not apply with respect to blasting operations that use,
 - (a) a combination blast initiation device and high-frequency radio signal that have been designed for that purpose; or
 - (b) a high-frequency impulse-initiated detonator.

109. Procedures for hazardous dust explosions

Change to read: "Where in a mine there exists **the hazard of an explosion such as** a sulfide dust explosion owing to high....."

Add new section: Flow of Flammable Gas

(1) If a flow of flammable gas is encountered in a mine or in an enclosed building housing a diamond drill on the surface and the concentration of the flammable gas is unknown,

- (a) all sources of ignition in the affected area shall be eliminated;
- (b) all electrical equipment in the affected area shall be de-energized;
- (c) the affected area shall be evacuated;
- (d) precautions shall be taken to prevent persons from entering the affected area inadvertently;
- (e) a supervisor shall be notified;
- (f) the affected area shall be tested by a competent person; and
- (g) the affected area shall be designated as a fire hazard area.

(2) Subject to subsections (3), (4) and (5), work may resume if the concentration of flammable gas is below 1.0 per cent.

(3) If the concentration is less than 0.25 per cent and the affected area is tested periodically to ensure that the level of concentration is known, no precautions are required.

(4) If the concentration is 0.25 per cent or greater but not more than 0.5 per cent, all of the following precautions shall be taken:

- 1. The supervisor shall provide written instructions of any special precautions.
- 2. The instructions, if any, shall be communicated to the workers.
- 3. The affected area shall be designated as a fire hazard area.
- 4. The affected area shall be tested at least once per shift before work begins and, again, on release of any further flow of gas.
- 5. A flammable gas detector shall remain in the affected area for the purpose of continued testing.

(5) If the concentration is 0.5 per cent or greater but not more than 1.0 per cent, all of the precautions set out in subsection (4) shall be taken and the electrical equipment, diesel engines, tools and other material used in the workplace shall be designed to function safely in a flammable gas atmosphere.

(6) If concentrations of flammable gas exceed 1.0 per cent in an area, all of the following precautions shall be taken:

- 1. All sources of ignition in the affected area shall be eliminated.
- 2. All electrical equipment in the affected area shall be de-energized.

3. All persons, other than competent persons necessary to measure the concentration of flammable gas and to make ventilation changes, shall be removed from the affected area.

(7) In mines where flammable gas is known to occur, workers who are underground or diamond drillers who are on the surface shall be advised of,

(a) the probability of encountering a flow of the gas; and

(b) the measures and procedures prescribed in this section.

(8) For the purposes of this section, the concentration of flammable gas means the percentage, by volume, of flammable gas in the general atmosphere.

Add in PART XXVIII.6

We require protection for workers from loaded blasting holes when a lightning storm is in progress or is approaching a mine or worksite. We require language that would keep workers protected from the blasting area until the danger of the lightning storm has passed.

We require language that addresses what a safe distance would be for workers working near loaded blasting holes when haulage truck drivers or other vehicles are operating in close proximity to loaded holes.

Other key recommendations:

- That comprehensive training programs be developed and maintained specific to the underground and surface mining sectors. We recommend using the same model as in Ontario for these training programs which are jointly developed by labour and management in the mining industry.
- That a regulation be developed to protect workers against the harm and hazards of radiation and radon daughters. We recommend that the government obtain the services of the Radiation Safety Institute of Canada to assist in the development of a training and monitoring program for radiation and radon daughters.
- Any procedure developed in the Regulations by an employer at a mine shall have the involvement and approval of the joint health and safety committee at that workplace.
- That a section be developed addressing the issue of hours of work for mining.

- That a procedure shall be established and maintained at an underground mine to record every worker and other person who is underground in the mine.

- That a section be developed that deals with how to handle non-routine hazardous tasks. We recommend:
 - The employer and the joint health and safety committee or the health and safety representative shall jointly establish safe procedures for performing a non-routine hazardous task.
 - The employer shall ensure that the safe procedures are set out in writing.
 - The employer shall ensure that workers are informed that a task is a non-routine hazardous task and are informed about the procedures for performing it before beginning the task.

- That a section be developed dealing with the issues of working around open brows underground.

- That a process be developed involving equal representation from organized labour and the mining industry to review the mining regulations on a set schedule.

We hope the government finds our recommendations helpful, and we look forward to your response.

Respectfully submitted January 11, 2011