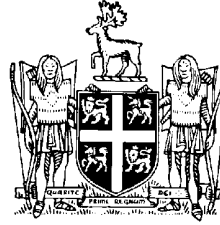


April 13, 2007



**NEWFOUNDLAND AND LABRADOR
REGULATION /07**

Occupational Health and Safety Regulations, 2007
under the
Occupational Health and Safety Act

(Filed , 2007)

Under the authority of section 65 of the *Occupational Health and Safety Act*, the Lieutenant-Governor in Council makes the following regulations.

Dated at St. John's,

Robert C. Thompson
Clerk of the Executive Council

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Short title

1. These regulations may be cited as the *Occupational Health and Safety Regulations, 2007*.

PART I GENERAL

Interpretation

2. (1) In these regulations

- (a) "accident" includes
 - (i) an event occasioned by a physical or natural cause, or
 - (ii) disablement arising out of and in the course of employment;
- (b) "ACGIH" means the American Conference of Governmental Industrial Hygienists;
- (c) "Act" means the *Occupational Health and Safety Act*;
- (d) "ASHRAE" means the American Society of Heating, Refrigeration and Air Conditioning Engineers;

- (e) "authorized" means, in reference to a person, a qualified person designated by an employer to carry out specific functions;
- (f) "commission" means the Workplace Health, Safety and Compensation Commission established under the *Workplace Health, Safety and Compensation Act*;
- (g) "CSA" means the Canadian Standards Association;
- (h) "hazardous health occupation" means an occupation from which an occupational disease may arise;
- (i) "injury" means a decreased physical ability to function as a result of an immediate event or long-term exposure to repetitious, heavy or awkward demands;
- (j) "occupation" means an employment, business, calling or pursuit but does not include an endeavour that is not included in one of the classes of occupations in the current National Occupational Classification List developed by the Department of Human Resources and Social Development Canada in collaboration with Statistics Canada;
- (k) "occupational health service" means a service established in or near a workplace to maintain and promote the physical and mental well-being of workers and may include personnel, equipment, transportation, supplies and facilities;
- (l) "plant" means buildings, equipment and facilities where a worker or self-employed person is engaged in an occupation;
- (m) "professional engineer" means a person who holds a certificate of registration to engage in the practice of engineering under the *Engineers and Geoscientists Act*;
- (n) "proof test" means a test applied to a product to determine material or manufacturing defects;
- (o) "qualified" means being knowledgeable of the work, the hazards involved and the means to control the hazards, by reason of education, training, experience or a combination thereof;

(p) "supervisor" means a superintendent or other worker authorized or delegated to exercise direction and control over workers of an employer; and

(q) "TLV" means the documentation of threshold limit values for chemical substances and physical agents in the work-room environment as published annually or more frequently by the ACGIH.

(2) In these regulations, a reference to a code or guideline includes any amendments to that code or guideline and a reference shall be presumed to be a reference to the most current code or guideline.

Application

3. (1) These regulations apply to all employers and self-employed persons and workers and other persons to whom the Act applies except where the context of the regulations indicates otherwise.

(2) Where the workplace is a mine as defined in the *Mining Act*, in the case of a conflict between these regulations and the *Mines Safety of Workers Regulations*, these regulations shall apply.

Responsibility of
division

4. The division shall approve and distribute educational material, information and statistics required in the administration of the Act.

Refusal to work

5. (1) Where an employer cannot resolve a problem in the workplace regarding occupational health and safety and there is a refusal to work, the problem shall be referred to the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as appropriate, and the employer shall notify the division.

(2) Where a notification under subsection (1) is made orally, the employer shall provide the division with a written confirmation of the notification within 5 days of the oral notification.

(3) Where action has been taken by a worker to exercise the right to refuse to work under the Act, the employer shall not assign a substitute worker to perform those duties unless the substitute worker has been informed of the prior refusal and the reason or reasons for that refusal.

Stop work orders

6. (1) Stop work orders shall

- (a) be in a form prescribed by the minister;
- (b) be posted in the workplace; and
- (c) where applicable, state the remedial action to be taken.

(2) A copy of a stop work order shall be provided by the division to the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as appropriate.

(3) A stop work order shall not be cancelled or removed from the workplace until the remedial action has been taken to the satisfaction of an officer.

Appeal

7. (1) An appeal under section 33 or an application under section 51 of the Act to the board shall contain

- (a) the name and address of the person making the appeal or the application;
- (b) the names and addresses of all other parties involved in the appeal or application; and
- (c) a statement of the grounds on which the appeal or application is being made.

(2) The board shall

- (a) give notice of the appeal or application; and
- (b) send one or more copies of the appeal or application

to all parties considered by the board to be affected by the appeal or application.

(3) The parties referred to in subsection (2) shall, within 14 calendar days of receiving a copy of the appeal or application, file a reply with the board.

PART II NOTICE REQUIREMENTS

8. Before beginning a new construction project or an industrial enterprise that is intended to continue for 30 days or more, an employer shall

- (a) send a written notice to the minister containing the name of the plant or construction site, its location, the mailing address to which correspondence should be directed, the nature of the work, the numbers of workers to be employed and the name of the firm under which the business is to be carried on; and
- (b) in the case of a plant, provide the minister, upon request, with plans showing the plant buildings and the main disposition of equipment and information relevant to processes and the nature of the substances that may be used.

Notifiable occupational diseases

9. (1) The occupational diseases for which notification is required under section 60 of the Act shall be those set out in section 23 of the *Workplace Health, Safety and Compensation Regulations* under the *Workplace Health, Safety and Compensation Act*.

(2) Workers engaged in occupations resulting in occupational diseases referred to subsection (1) are considered to be engaged in hazardous health occupations.

Notification of accident

10. (1) In these regulations, serious injury does not include an injury of a nature that may be treated through normal first aid or medical attention, or where a worker returns to his or her regular work immediately after treatment, or at the next scheduled shift.

- (2) Serious injury includes an injury that
 - (a) places life in jeopardy;
 - (b) produces unconsciousness;
 - (c) results in substantial loss of blood;
 - (d) involves the fracture of a leg or arm but not a finger or toe;

- (e) involves the amputation of a leg, arm, hand, foot, finger or toe;
- (f) consists of burns to a major portion of the body; or
- (g) causes the loss of sight in an eye.

(3) An employer shall, within 3 days after an accident happens to a worker that prevents the worker from earning full wages or due to which the worker receives medical aid, provide written notice to the minister advising the minister that an accident has occurred and containing the following information:

- (a) the nature of the accident;
- (b) the time and place of the accident;
- (c) the name and address of the worker injured in the accident; and
- (d) the name and address of the physician who treated or is treating the worker for the injury.

(4) An employer shall make those other reports and supply such other information respecting the accident and the worker as may be required by the minister.

(5) A fatality shall be reported to the minister immediately by telephone, or by whatever other means of communication as are readily available and that report shall be followed up in writing within 5 days.

(6) For the purpose of subsection (3), a copy of the applicable Workplace Health, Safety and Compensation Commission Accident Reporting Form is acceptable.

(7) Where the minister finds that it is impractical to conduct an investigation respecting an accident, the report of the investigation by the occupational health and safety committee or the worker health and safety representative or the workplace health and safety designate shall be forwarded to the minister.

(8) Where a medical practitioner requires a worker to be examined to determine

(a) the extent of an injury suffered in the course of his or her occupation; or

(b) whether he or she suffers from an occupational disease,

the medical report of the commission may be accepted.

11. An employer whose work activities result in a hit or damage to a pipeline, buried electrical cable, overhead cable or other utility shall notify the owner of the utility without delay.

PART III GENERAL DUTIES

Occupational health
and safety program

12. (1) An occupational health and safety program required under section 36.1 of the Act or by an officer shall be signed and dated by the employer and by the person or persons responsible for the management of the employer's operations in the province and shall include:

(a) a statement of the employer's commitment to cooperate with the occupational health and safety committee and workers in the workplace in carrying out their collective responsibility for occupational health and safety;

(b) a statement of the respective responsibilities of the employer, supervisors, the occupational health and safety committee and workers in carrying out their collective responsibility for occupational health and safety;

(c) procedures to identify the need for, and for the preparation of written safe work procedures to implement health and safety practices, including practices required by the Act and the regulations, or as required by an officer;

(d) a plan for orienting and training workers and supervisors in workplace and job-specific safe work practices, plans, policies and procedures, including emergency response, that are necessary to eliminate, reduce or control hazards;

(e) provisions for establishing and operating an occupational health and safety committee, including provisions respecting

(i) maintenance of membership records,

- (ii) procedural rules,
 - (iii) access by the committee to management staff with the authority to resolve health and safety issues and to information about the employer's operations required under the Act and the regulations, and
 - (iv) a plan for training committee members as required under the Act;
- (f) a system for the recognition, evaluation and control of hazards that includes:
- (i) evaluation and monitoring of the workplace to identify potential hazards and the associated risks,
 - (ii) procedures and schedules for regular inspections by management and committee members,
 - (iii) procedures for the identification, reporting and control or correction of hazards,
 - (iv) procedures for the prompt investigation of hazardous occurrences to determine the cause of the occurrence and the actions necessary to prevent a recurrence,
 - (v) identification of the circumstances where the employer is required to report hazards to the committee and the procedures for doing so, and
 - (vi) measures for the accountability of persons responsible for the reporting and correction of hazards;
- (g) a plan for the control of biological and chemical substances handled, used, stored, produced or disposed of at the workplace and where appropriate, the monitoring of the work environment to ensure the health and safety of workers and other persons at or near the workplace;
- (h) a system to ensure that persons contracted by the employer or for the employer's benefit comply with the program developed under this section and the Act and regulations;

- (i) an emergency response plan;
- (j) maintenance of records and statistics, including occupational health and safety committee minutes, reports of occupational health and safety inspections and investigations, with procedures to allow access to them by persons entitled to receive them under the Act; and
- (k) provision for monitoring the implementation and effectiveness of the program.

(2) An employer that is required to establish and maintain an occupational health and safety program under section 36.1 of the Act shall

- (a) implement the occupational health and safety program; and
- (b) review and, where necessary, revise the occupational health and safety program as follows:
 - (i) at least every 3 years,
 - (ii) where there is a change of circumstances that may affect the health and safety of workers, and
 - (iii) where an officer requests a review.

Occupational health
and safety policy

13. (1) An occupational health and safety policy required under section 36.2 of the Act shall be signed and dated by the employer and by the person or persons responsible for the management of the employer's operations in the province, and shall contain a statement of the employer's commitment to occupational health and safety that includes:

- (a) a statement of the employer's commitment to cooperate with the worker health and safety representative or the workplace health and safety designate and workers in the workplace in carrying out their collective responsibility for occupational health and safety; and
- (b) a statement of the respective responsibilities of the employer, supervisors, the worker health and safety representative or the workplace health and safety designate and other

workers in carrying out their collective responsibility for occupational health and safety.

(2) An employer that is required to establish and maintain an occupational health and safety policy under section 36.2 of the Act shall review and, where necessary, update the policy at least annually, in consultation with the worker health and safety representative or the workplace health and safety designate.

General duties of employers

14. (1) An employer shall ensure, so far as is reasonably practicable, that all buildings, structures, whether permanent or temporary, excavation, machinery, workstations, places of employment and equipment are capable of withstanding the stresses likely to be imposed upon them and of safely performing the functions for which they are used or intended.

(2) An employer shall ensure that necessary protective clothing and devices are used for the health and safety of his or her workers.

(3) The employer shall ensure that safety procedures are followed at all workplaces.

(4) An employer shall ensure, as far as is reasonably practicable, that work procedures promote the safe interaction of workers and their work environment so as to minimize the potential for injury.

Working alone

15. (1) An employer shall develop and implement a written procedure for checking the well-being of a worker assigned to work alone or in isolation under conditions which present a risk of injury, where the worker might not be able to secure assistance in the event of injury or other workplace incident.

(2) The procedure referred to in subsection (1) shall include the time interval between checks and the procedure to follow in case the worker cannot be contacted, including provisions for emergency response

Safe working load of equipment

16. (1) Except as provided elsewhere in these regulations, the safe working load of equipment shall be that specified by the manufacturer.

(2) The safe working load of equipment shall be certified by a suitably qualified and registered professional engineer or other person

named by the employer and acceptable to the assistant deputy minister where

- (a) the manufacturer's specification or other acceptable warranty cannot be produced;
- (b) the equipment has been modified in a manner that will change its safe working load;
- (c) wear, corrosion, damage or signs of fatigue are found which may reduce the safe working load;
- (d) the equipment is used in a manner or for a purpose other than that for which it was originally designed, where that use will change the safe working load; or
- (e) the provision of the certification is considered to be necessary by an officer.

General duties of
workers

17. (1) A worker shall make proper use of all necessary safeguards, safety devices, lifting devices or aids, and appliances

- (a) designated and provided for his or her protection by the employer; or
- (b) required under these regulations to be used or worn by a worker.

(2) A worker shall follow the safe work procedure in which he or she has been instructed.

(3) A worker shall immediately report a hazardous work condition that may come to his or her attention to the employer or supervisor.

General duties of
supervisor

18. A supervisor shall take every reasonable precaution to

- (a) ensure the health and safety of all workers under his or her supervision;
- (b) advise workers of the existence of a potential or actual health or safety hazard in the area where the work is occurring or relating to the work being performed;

- (c) provide proper written or oral instructions regarding precautions to be taken for the protection of workers; and
- (d) ensure that a worker uses or wears protective equipment measuring devices or clothes that the Act, these regulations or the employer requires to be used or worn.

Safety inspections

19. (1) Regular inspections of all buildings, excavations, structures, machinery, equipment, work practices and places of employment shall be made by the employer or his or her representative at intervals to ensure that safe working conditions are maintained and that unsafe conditions found as a result of the inspection are remedied without delay.

(2) Where an unsafe condition is discovered by a person, it shall be reported as soon as practicable to a supervisor who shall ensure that appropriate action is taken, without delay, to prevent a worker from being injured.

(3) Where emergency action is required to correct a condition that constitutes an immediate threat to workers, only those qualified and properly instructed workers necessary to correct the unsafe condition shall be exposed to the hazard and every possible effort shall be made to control the hazard while the corrective action is taking place.

Co-ordination of work

20. (1) An owner shall ensure that all workers and other persons at the workplace are informed of

- (a) the hazards of an owner's operations or site conditions; and
- (b) the health and safety activities to be used to address the hazards.

(2) Work schedules and tasks shall be organized to provide safe working conditions for workers.

Two or more employers

21. Where a construction project involves the work of 2 or more employers or their workers

- (a) the principal contractor shall ensure compliance with the regulations where conditions or activities affect the workers of more than one employer;

- (b) each employer and the workers of that employer are responsible for complying with the applicable requirements of the regulations; and
- (c) each employer shall notify the owner or the principal contractor, if one has been engaged, in advance of an undertaking likely to create a hazard for a worker of another employer.

Appointment of
qualified co-
ordinator

22. Where, at a work location, the overlapping or adjoining work activities of 2 or more employers create a hazard to workers and the combined work force at the workplace is more than 5 persons,

- (a) the principal contractor shall
 - (i) appoint a qualified co-ordinator for the purpose of ensuring the co-ordination of health and safety activities for the location, and
 - (ii) provide up-to-date information as specified in sections 23 and 24 and ensure that it is readily available at the location; and
- (b) each employer shall give the co-ordinator appointed under subparagraph (a)(i) the name of a qualified person designated to be responsible for that employer's health and safety activities at the location.

Duties of qualified
co-ordinator

23. The duties of a qualified co-ordinator appointed under subparagraph 22(a)(i) shall include

- (a) the development of a formal hazard assessment process;
- (b) informing the employers and workers of the hazards created; and
- (c) ensuring that the hazards are addressed throughout the duration of the work activities.

Information re-
quired

- 24.** (1) The information required by subparagraph 22(a)(ii) includes
- (a) the name of the qualified co-ordinator appointed under subparagraph 22(a)(i);

- (b) a site drawing which shall be posted and show the project layout, first aid locations, emergency transportation provisions and the evacuation marshalling station; and
- (c) a set of construction procedures designed to protect the health and safety of workers at the workplace, developed according to the requirements of these regulations.

**PART IV
OCCUPATIONAL HEALTH AND SAFETY
COMMITTEES, REPRESENTATIVES AND
DESIGNATES**

Operations of
committees, repre-
sentatives and
designates

25. (1) An employer shall ensure that

- (a) an occupational health and safety committee is established;
- (b) a worker health and safety representative is appointed; or
- (c) a workplace health and safety designate is designated; and
- (d) a copy of the Act and regulations under the Act are easily accessible to an employee.

(2) Minutes of all regular meetings and special committee meetings shall be recorded in the form prescribed by the commission and one copy shall be kept on file with the committee, one copy shall be filed with the commission and one copy shall be posted in the workplace.

(3) An occupational health and safety committee shall

- (a) meet within 2 weeks of its establishment;
- (b) elect co-chairpersons as required by subsection 38(6) of the Act; and
- (c) notify the commission of the elected co-chairs.

(4) A quorum of the committee shall consist of one-half of its membership, provided that both employer and worker members are represented.

(5) Where an agreement cannot be reached between co-chairpersons on convening a meeting of the committee, the minister may be requested to intervene.

(6) The minister may require that a committee have monthly meetings where a particular hazard is involved, the operations are particularly complex or large numbers of workers are involved.

(7) A representative of the employer and

(a) the workers of an occupational health and safety committee;

(b) the worker health and safety representative; or

(c) the workplace health and safety designate, except where the workplace health and safety designate is the employer,

may accompany an officer of the division when the health and safety inspections are being conducted.

(8) Copies of all health and safety inspection reports made by an officer of the division, shall be circulated by the employer to

(a) the occupational health and safety committee;

(b) the worker health and safety representative; or

(c) the workplace health and safety designate.

PART V GENERAL HEALTH AND SAFETY REQUIREMENTS

Personal conduct

26. (1) A worker with a known physical or mental impairment shall not be assigned to work where those impairments endanger the health and safety of that worker or other workers.

(2) An employer, supervisor or worker shall not enter or remain on the premises of a workplace or at a job site while his or her ability to perform work responsibilities is impaired by intoxicating substances or another cause so as to endanger his or her health or safety or that of other workers.

(3) A person shall not engage in horseplay, scuffling, unnecessary running or jumping, practical jokes or other similar activity or behaviour that might create or constitute a hazard to workers.

(4) Before tools, machinery or equipment is put into operation, the person responsible for doing so shall ensure that all guards are in place and that putting the equipment into operation does not endanger a person.

Travel over ice

27. Equipment shall not cross over a frozen body of water where the water at any point is over 1.22 metres deep until the ice has been tested and declared safe by a qualified person using accepted ice testing standards.

Guardrails

28. (1) Guardrails shall be installed where an open-sided floor, working platform, runway, walkway or balcony is over 1.22 metres above the existing floor or ground level.

(2) Detour guardrails shall be installed where a stairway ends in direct proximity to dangerous traffic or other hazards.

(3) Guardrails shall be of substantial construction and

(a) the vertical members shall be spaced no more than 2.44 metres apart;

(b) the top rails shall not be less than 1.07 metres above floor level; and

(c) an intermediate rail shall be installed between the top rail and the floor.

(4) Guardrails shall be installed on walkways over open tanks containing harmful substances or over open tanks 1.22 metres or more in depth.

(5) Walkways and platforms at any height when installed over machinery and work areas shall be equipped with toe boards.

Openings, pits and tanks

29. (1) Where a worker is employed around an open tank containing liquid or a harmful substance, the sides of the tanks shall be constructed to extend at least 91.44 centimetres above a working platform or stan-

Standard guardrails shall be provided to prevent the worker from falling into the tank.

(2) A hole or pit in a floor, roof, walkway or work area accessible to a worker shall be securely covered and identified.

(3) Where a vehicle service pit is used so frequently that compliance with this section is impractical, the perimeter of the pit shall be delineated by high visibility, luminescent, skid-resistant paint instead of guardrails.

(4) A vehicle service pit shall have a fixed ladder at each end.

Material storage

30. (1) Material and equipment shall be placed, stacked or stored in a stable and secure manner that does not constitute a hazard to a worker who is in the area or who is manually stacking the items.

(2) Stacked material or containers shall be stabilized as necessary by interlocking, strapping or other effective means of restraint.

(3) A worker shall not enter or remain in any place where there is a danger of entrapment or engulfment unless

(a) safe access and a safe work area is provided by catwalks, walkways, barriers or other means; or

(b) measures are taken, where practicable, to control the risk of entrapment or engulfment and, if the risk is not eliminated, the worker

(i) shall use a lifeline and harness prescribed in Part X that keeps the worker in a position so as to be able to be rescued, and

(ii) is continuously tended by a standby person who is equipped for and capable of effecting immediate rescue.

(4) An area in which material may be dropped, dumped or spilled shall be guarded to prevent inadvertent entry by a worker, or protected by adequate covers and guarding.

31. Signs posted in a workplace shall conform with the requirement of CSA Standard "Signs and Symbols for the Workplace - National Standards for the Workplace".

Signage

Overcrowding

32. An employer shall, to the extent reasonably practical, ensure that a workplace or an area in that workplace is not so overcrowded as to cause risk of injury to the health or safety of a worker.

Slipping hazards

33. (1) Where the regular work process results in liquid spilling on to the floor or work areas, and where this spillage could introduce a slipping or other hazard, floor drains shall be installed or other suitable means used or adopted to eliminate this hazard.

(2) Only an approved non-combustible grease and oil absorbent shall be used to eliminate a hazard referred to in subsection (1).

(3) Where wet processes are used, an employer or contractor shall ensure that reasonable drainage is maintained and that false floors, platforms, mats or other dry standing places are provided and kept clean.

Barriers

34. Where a worker may be exposed to flying fragments or particles, he or she shall be protected by an appropriate barrier or wear appropriate personal protection equipment.

Illumination

35. (1) An employer shall provide sufficient and suitable lighting, whether natural or artificial, in every part of a workplace while a worker is present and the illumination shall comply with the standards set by the American National Standards Institute - Illuminating Engineering Society, RP7 - 2001.

(2) An employer shall ensure that all glazed windows and skylights used for the lighting of a workplace shall be kept clean on both inner and outer surfaces and free from obstructions, but this subsection shall not affect the coloring or shading of windows and skylights for the purpose of mitigating heat or glare.

(3) An artificial light source or reflective surface shall be positioned, screened or provided with a shade to prevent glare or discomfort or the formation of shadows that cause eyestrain or a risk of accident or injury to workers.

(4) Where the visibility in a work area is restricted due to the presence of smoke, steam or other substances in the atmosphere, and where this condition may result in injury to workers, corrective measures shall be taken to eliminate, control or reduce the hazard.

Risk assessment

36. (1) An employer shall conduct a risk assessment in a workplace in which a need to rescue or evacuate workers may arise.

(2) Where the risk assessment required by subsection (1) shows a need for evacuation or rescue, appropriate written procedures shall be developed and implemented and a worker assigned to coordinate their implementation.

(3) Written rescue and evacuation procedures are required for but not limited to

- (a) work at high angles;
- (b) work in confined spaces or where there is a risk of entrapment;
- (c) work with hazardous substances;
- (d) underground work;
- (e) work on or over water; and
- (f) workplaces where there are persons who require physical assistance to be moved.

Emergency procedures

37. (1) An emergency exit route shall be provided from a work area in which the malfunctioning of equipment or a work process could create an immediate danger to a worker and the regular means of exit could become dangerous or unusable.

(2) An emergency exit route shall be designed and marked to provide quick and unimpeded exit.

(3) At least once a year an emergency drill shall be held to ensure awareness and effectiveness of the emergency exit routes and procedure, and a record of the drill shall be kept for a period of 5 years.

38. (1) Where a failure of a lighting system would create conditions dangerous to the health and safety of workers, an emergency lighting system shall be provided for the workplace and the exit routes.

(2) An emergency lighting system shall provide dependable illumination while the primary lighting system is off to enable all emergency measures to be carried out, including

(a) emergency shutdown procedures, and

(b) evacuation of workers from the premises.

39. (1) A worker shall be given adequate instruction in the fire prevention and emergency evacuation procedures applicable to his or her workplace.

(2) A worker assigned to firefighting duties in a workplace shall be given adequate training by a qualified instructor in fire suppression methods, fire prevention, emergency procedures, organization and chain of command, firefighting crew safety and communications applicable to the workplace.

(3) Retraining for firefighting duties shall be provided periodically, but not less than once a year.

40. Compressed air shall not be used to clean clothes, machinery, work benches or floors.

PART VI OCCUPATIONAL HEALTH REQUIREMENTS

41. (1) The minister, in consultation with a medical practitioner, may prescribe the type and frequency of medical examinations required by a worker engaged in a hazardous health occupation or suffering from an occupational disease.

(2) In addition to the first aid services referred to in these regulations, the minister may order the establishment of other occupational health services to ensure the health and safety of workers.

42. (1) An employer shall ensure that a thermal environment which is reasonable and consistent with the nature and degree of the work

performed, as established by the ACGIH, is provided and maintained in a workplace.

(2) An employer shall provide appropriate and suitable monitoring equipment in a workplace where the thermal environment is likely to be of concern to a worker.

(3) Under unusually hot or cold working conditions an employer shall make further provision for the health and safety and reasonable thermal comfort of a worker, which may include:

- (a) regular monitoring, posting of warning devices and additional first aid measures;
- (b) provision of special equipment and clothing;
- (c) provision of screens or shelters;
- (d) medical supervision, hot or cold drinks and acclimatization procedures;
- (e) limited work schedules with rest periods; and
- (f) other appropriate controls and measures.

(4) In a workplace, an open flame, steampipe or other high temperature source shall be identified at the source and positioned or shielded to prevent contact by a worker, unless the exposed source is necessary for work processes and cannot be appropriately controlled by engineering means.

(5) Where a source referred to in subsection (4) is necessarily exposed, a worker shall wear appropriate personal protective equipment.

Ventilation

43. (1) An employer shall ensure that

- (a) there is appropriate circulation of clean and wholesome air;
- (b) there is adequate ventilation; and
- (c) impurities are made harmless and inoffensive

in a workplace in accordance with standards established by ASHRAE and ACGIH.

(2) Where a work or process gives off dust, fumes, vapour, mist or other impurity of a kind and quantity liable to be injurious or offensive to a worker, an employer shall provide, maintain and ensure the proper use of a ventilation system sufficient to protect the worker against inhalation of impurities and to prevent impurities accumulating in the work space.

(3) Where practicable, local exhaust ventilation shall be installed and maintained near to the point of origin of an impurity to prevent it entering the air of the workplace.

(4) Impurities removed under subsections (2) and (3) shall be exhausted clear of a workplace and prevented from entering a workplace.

(5) An employer shall ensure that,

(a) all parts of a ventilation system are maintained;

(b) louvers are cleaned regularly; and

(c) ventilation openings are free of obstruction and sources of contamination.

(6) Where possible, exhaust from any internal combustion engine operated indoors shall be vented to the outdoors.

(7) Where mobile equipment powered by an internal combustion engine is operated indoors or in an enclosed work area

(a) the engine shall be adequately serviced and maintained to minimize the concentration of air contaminants in the exhaust, and

(b) the work area shall be assessed to determine the potential for exposure of workers to harmful levels of exhaust components.

(8) Where a worker is or may be exposed to an exhaust gas component in concentrations exceeding the applicable exposure limits,

exhaust gas scrubbers, catalytic converters, or other engineering controls shall be installed.

- (9) An employer, contractor or owner shall ensure that
 - (a) the mechanical ventilation system
 - (i) including any humidification equipment, is constructed and maintained to minimize the growth and dissemination of micro-organisms, insects and mites through the ventilation system, and
 - (ii) where reasonably practicable, is readily accessible for cleaning and inspection;
 - (b) a competent person inspects and maintains all parts of a mechanical ventilation system, cleans all louvers and replaces or adequately cleans all filters at a frequency that is sufficient to protect the health and safety of workers;
 - (c) a record of all inspections, maintenance and cleaning of the mechanical ventilation system is
 - (i) completed by a competent person who performs the work, and
 - (ii) readily available for examination by the occupational health and safety committee, or worker representative or designate or, where there is no committee, representative or designate, by the workers and the occupational health and safety officer;
 - (d) when mechanical ventilation is required, the ventilating fans are located to prevent recirculation of contaminated air; and
 - (e) measurements of the air volume of the mechanical ventilation system are taken at suitable intervals to ensure compliance with the minimum air volume requirements in accordance with standards established by ASHRAE or the equivalent.

Musculoskeletal
injury prevention

44. (1) For purposes of this section and sections 45 to 50, "musculoskeletal injury" means an injury or disorder of the muscles, tendons,

ligaments, joints, nerves, blood vessels or related soft tissue, including a sprain, strain and inflammation, that may be caused or aggravated by work.

(2) An employer shall

- (a) identify factors in the workplace that may expose workers to a risk of musculoskeletal injury; and
- (b) assess the risk to workers presented by the factors that have been identified under paragraph (a).

(3) For purposes of subsection (2), the following factors shall be considered, where applicable, in the identification and assessment of risk:

(a) the physical demands of work activities, including

- (i) forceful exertions,
- (ii) repetitive motions;
- (iii) limitations on motion or actions,
- (iv) sustained or awkward postures, and
- (v) local contact stresses;

(b) aspects of the layout and condition of the workplace or workstation, including

- (i) working reaches,
- (ii) working heights,
- (iii) seating, and
- (iv) floor surfaces;

(c) the characteristics of objects handled, including

- (i) size and shape,

- (ii) load condition and weight distribution, and
- (iii) container, tool and equipment handles;
- (d) environmental conditions, including cold temperature; and
- (e) the following characteristics of the organization of work:
 - (i) work-recovery cycles,
 - (ii) task variability, and
 - (iii) work rate.

Risk control

45. (1) An employer shall eliminate, or where elimination is not practicable, minimize the risk of musculoskeletal injury to a worker through the implementation of a control measure that may include one or more of the following:

- (a) providing, positioning and maintaining equipment that is designed and constructed to reduce or eliminate the risk of musculoskeletal injury;
- (b) developing and implementing safe work procedures to eliminate or reduce the risk of musculoskeletal injury;
- (c) implementing work schedules that incorporate rest and recovery periods, changes to workload or other arrangements for alternating work; and
- (d) providing personal protective equipment in accordance with Part VII.

(2) Personal protective equipment may only be used as a substitute for engineering or administrative controls where it is used in circumstances in which those controls are not practicable.

(3) An employer shall, without delay, implement interim control measures when the introduction of permanent control measures will be delayed.

Education and training

46. An employer shall ensure that a worker who is or may be exposed to a risk of musculoskeletal injury is

- (a) educated in risk identification related to work, including the recognition of early signs and symptoms of musculoskeletal injury and its potential health effects; and
- (b) trained in the use of specific control measures, including, where applicable, work procedures, mechanical aids and personal protective equipment.

Evaluation

47. (1) An employer shall

- (a) monitor the effectiveness of a control measure implemented to eliminate or reduce the risk of musculoskeletal injury; and
- (b) where the monitoring referred to in paragraph (a) identifies a risk of musculoskeletal injury that is not or has not been eliminated or reduced, implement additional control measures, where reasonably practicable.

(2) Deficiencies identified as a result of monitoring under subsection (1) shall be corrected without undue delay.

Consultation

48. (1) An employer shall consult with the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as applicable, with respect to the following when required by sections 44 to 50:

- (a) risk identification, assessment and control;
- (b) the content and provision of worker education and training; and
- (c) the evaluation of compliance measures.

(2) An employer shall, when performing a risk assessment, consult with

- (a) workers with signs or symptoms of musculoskeletal injury; and
- (b) a representative sample of the workers who are required to carry out the work being assessed.

Seating or standing
work

49. (1) Where a worker in the course of his or her work has a reasonable opportunity to sit without detriment to his or her work, an employer shall provide and maintain suitable seating for the worker's use to enable him or her to take advantage of that opportunity.

(2) Where a substantial proportion of work can be done while seated, an employer shall provide and maintain for a worker a seat suitably designed, constructed, dimensioned and supported for the worker to do the work, including, where necessary, a footrest that can readily and comfortably support the feet.

(3) An employer shall, where reasonably practicable, comply with the requirements of the CSA Standard for Office Ergonomics when designing or setting up an office work station.

(4) Where a worker is required to stand for long periods in the course of his or her work, an employer or contractor shall provide an antifatigue mat, footrest or other suitable device to provide relief.

Lifting and handling

50. (1) An employer or contractor shall ensure, where reasonably practicable, that suitable equipment is provided and used for the handling of heavy or awkward loads.

(2) Where the use of equipment is not reasonably practicable, an employer or contractor shall take all practicable means to adapt heavy or awkward loads to facilitate lifting, holding or transporting by workers or to otherwise minimize the manual handling required.

Radiation hazards

51. (1) Employers and workers involved or associated with the use, storage, handling, transportation or disposal of radioactive substances shall comply with

(a) the *General Nuclear Safety and Control Regulations* under the *Nuclear Energy Act* (Canada); and

(b) all applicable federal and provincial regulations.

(2) Equipment capable of producing ionizing or non-ionizing radiation shall be shielded, and suitable protective clothing or equipment shall be provided and used to ensure that a worker does not receive exposure in excess of recognized safe quantities.

(3) Safe operating procedures for the protection of workers in radiation environments shall be developed according to national safety codes by Health Canada.

(4) An employer shall ensure that each worker has read and understands the respective safety code or instructions for the radiation environment in which he or she works.

Hazardous sub-
stances

52. (1) An employer shall constantly review the use or presence of harmful substances at the workplace that may be hazardous to the health and safety of workers.

(2) In accordance with subsection (1), an employer shall implement a chemical control program commensurate with the associated risks.

(3) In accordance with subsection (1), an employer shall eliminate hazardous substances from the workplace and where this is not practicable substitute a less hazardous substance.

(4) Where hazardous substances exist, an employer shall employ administrative and engineering controls to ensure their safe use.

(5) An employer shall ensure that a substance produced, used or handled at a workplace which by reason of toxicity, flammability or reactivity creates a risk to the health or safety of workers is controlled in accordance with the Material Safety Data Sheet or manufacturer's specifications.

(6) Where the minister determines that the use or presence of a hazardous substance at a place of employment is liable to be injurious to the health of workers, the minister may inquire into the substance and may prohibit, restrict or modify the use of the substance until a time that an employer establishes to the minister that its use or presence will not be injurious to the health of workers.

(7) An employer shall ensure that

(a) atmospheric contamination of the workplace by hazardous substances is kept as low as is reasonably practicable;

- (b) a worker is informed of the nature and degree of health effects of the hazardous substances to which the worker is exposed;
- (c) exposure of a worker to hazardous substances is as minimal as is reasonably practicable, and where a threshold limit value has been established by the ACGIH, exposure shall not exceed the threshold limit value;
- (d) except as otherwise determined by the division, a worker is not exposed to a substance that exceeds the ceiling limit, short-term exposure limit or 8-hour TWA (time weighted average) limit prescribed by ACGIH; and
- (e) where a substance referred to in paragraph (d) has an 8-hour TWA limit, a worker's exposure to the substance does not exceed
 - (i) 3 times the 8-hour TWA limit for more than a total of 30 minutes during the work period, and
 - (ii) 5 times the 8-hour TWA limit at any time.

(8) Where extended work periods exist where the work period is more than 8 hours in a 24 hour day, the 8 hour exposure shall be adjusted accordingly as outlined in the ACGIH "Threshold Limit Values (TLVs)" Manual.

(9) Adjustment of TLVs, as required, shall be done in consultation with the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as appropriate.

(10) Where a worker is exposed to a substance which is designated as a reproductive toxin or a sensitizer, an employer shall develop policy and procedures appropriate to the risk, which may include protective reassignment.

(11) Where workers may be exposed to contact with chemicals harmful to the skin, facilities shall be available for the worker to effectively cleanse the contaminated body areas, including, where corrosive chemicals are involved, emergency water baths, showers, jump tanks, eyewash facilities or other effective means of treatment.

(12) The policy and procedures required by subsection (10) shall include

- (a) informing workers about the reproductive toxin and identifying ways to minimize exposure to the toxin for a worker who has advised the employer of pregnancy or intent to conceive a child; and
- (b) identifying ways to eliminate exposure to a sensitizer for a worker who is or may become sensitized to that substance.

(13) Solvents, oils, greases, paints or other flammable substances shall be cleaned up by using an approved non-combustible grease and oil absorbent which shall be placed in covered metal containers prior to disposal.

(14) Containers referred to in subsection (13) shall not be stored in work areas.

Permitted quantities

53. (1) The amount of a hazardous substance in a work area shall not exceed the quantity reasonably needed for work in progress, normally in one work shift.

(2) Bulk or reserve quantities of a hazardous substance shall be stored in a designated area separate from the work area.

Incompatible substances

54. Substances which are incompatible shall not be stored in a manner that would allow them to mix in the event of container leakage, breakage or other such circumstance.

Storage of hazardous substances

55. (1) A hazardous substance shall be stored in a designated area, in a manner which ensures that it will not readily fall, become dislodged, suffer damage, or be exposed to conditions of extreme temperature.

(2) A designated storage area for a hazardous substance shall be

- (a) designed and constructed to provide for the safe containment of the contents;
- (b) clearly identified by signs, placards or similar means;

- (c) designed and maintained to allow the safe movement of workers, equipment and material;
- (d) provided with adequate ventilation and lighting; and
- (e) in a location not normally occupied by workers, and not in a location such as a lunchroom, eating area, change room, clothing storage locker or passenger compartment of a vehicle.

Dispensing

56. Where a flammable liquid is dispensed or transferred inside a flammable liquids storage room,

- (a) the storage room shall be mechanically ventilated at a rate of at least 18 m³/hr per square metre of floor area (1 cfm/sq ft), but not less than 250 m³/hr (150 cfm);
- (b) exhaust air shall be discharged to the outdoors, and makeup air provided;
- (c) makeup air duct passing through a fire separation shall be equipped with an approved fire damper; and
- (d) doors shall be self-closing.

Toilet facilities

57. (1) An employer shall provide, maintain and keep clean sufficient and suitable toilet facilities for workers and shall make effective provision for lighting and heating the toilet facilities.

(2) Sufficient and suitable toilet facilities referred to in subsection (1) include the following:

- (a) one suitable toilet to be provided for up to 10 workers and one additional toilet for every 20 workers or fraction of those likely to be present;
- (b) additional toilets to be provided where toilet facilities are likely to be used by persons in addition to workers;
- (c) where both males and females are employed, separate toilets shall be provided and suitably identified for workers of each sex;

- (d) where more than 100 males work or are likely to work on a shift and sufficient urinal accommodations are provided, the requirements of paragraph (a) may be reduced at the discretion of an officer;
- (e) a toilet that is under cover and positioned and partitioned off to secure privacy shall have a proper door and fastenings;
- (f) doors and partitions shall extend at all parts from not more than 30.48 centimetres and not less than 1.83 metres above floor level;
- (g) a supply of toilet tissue shall be maintained in a toilet at all times and easily cleanable covered receptacles shall be provided for waste materials; and
- (h) the toilets shall be conveniently accessible to the workers at all times during work.

Washing facilities

58. (1) An employer shall provide and maintain for the use of workers

- (a) adequate and suitable facilities for personal washing; and
- (b) a supply of clean hot and cold or warm water, soap and clean towels or other suitable means of cleaning or drying.

(2) Where there is a high risk of contamination of workers by hazardous substances as a part of the regular work processes at a place of employment, an employer shall

- (a) where reasonably practicable, provide and maintain suitable, adequate and clean facilities for changing and showering; and
- (b) allow sufficient time during normal working hours for a worker to use those facilities without loss of pay or other benefits.

Emergency washing facilities

59. (1) An employer shall ensure that

- (a) appropriate emergency washing facilities are provided in a work area where a worker's eyes or skin may be exposed to

harmful or corrosive materials or other materials which may burn or irritate;

- (b) only a potable water supply is used in a plumbed emergency eyewash facility and that only potable water or an isotonic saline flushing solution is used in a portable (non-plumbed) eyewash unit;
- (c) access to emergency eyewash and shower facilities is not blocked by material or equipment; and
- (d) selection of emergency washing facilities is based upon an assessment of the risks present in the workplace.

Work clothing and accommodations

60. (1) An employer shall provide and maintain, for the use of workers, clean, adequate, appropriately located and suitable accommodations for street clothing not worn during working hours and where it is necessary to protect the street clothing from becoming wet, dirty or contaminated by work clothing, separate accommodation shall be provided.

(2) Where a worker's work clothing or skin is likely to be contaminated by hazardous substances, an employer shall

- (a) provide protective clothing and head cover appropriate to the work and hazard;
- (b) provide a suitably located changing area; and
- (c) ensure that the clothing and head cover are handled and cleaned or disposed of in a manner that will prevent worker exposure to hazardous substances.

Eating areas

61. Where a substance used in the work or a work process is likely to contaminate a worker's person, clothing or food, an employer, contractor or owner shall ensure that a clean eating area, separate from the worksite, is available and close to washing facilities.

Supply of drinking water

62. An employer shall provide and maintain at suitable points conveniently accessible to all workers, an adequate supply of wholesome drinking water from a public main or other source approved by the appropriate authority.

63. (1) An employer shall ensure that the workplace is sanitary and kept as clean as is reasonably practicable.

Sanitary and orderly conditions

(2) An employer shall ensure wherever reasonably practicable that

- (a) accumulated dirt and refuse is removed daily by a suitable method from floors, working surfaces, stairways and passages;
- (b) floors are cleaned at least once a week by washing, vacuum cleaning or other effective and suitable means;
- (c) interior walls and partitions, ceilings, passages and staircases are kept in a reasonable state of repair and suitably finished and maintained; and
- (d) floors, platforms, stairs and walkways used by workers are kept in a state of good repair and free of hazards.

Noise hazards

64. (1) When a worker is required to work in an area in which noise levels exceed the criteria for permissible noise exposure as established by the ACGIH Noise Threshold Limit Values (TLVs)

- (a) the employer shall first take appropriate action to implement control measures to reduce noise to acceptable levels; and
 - (b) where it is not practicable to reduce the noise to acceptable levels or to isolate workers from the noise, the workers shall wear personal protective equipment in accordance with CSA which will effectively protect their hearing in accordance with the ACGIH Noise TLVs.
- (2) Where conditions referred to in subsection (1) exist, an employer shall establish and maintain a hearing conservation program.
- (3) A hearing conservation program established under subsection (2) shall comply with the following minimum requirements:
- (a) a noise survey of the workplace to identify high noise areas shall be performed in accordance with CSA Z107.56 "Procedures for the Measurement of Occupational Noise Exposure";

- (b) hearing tests for every worker exposed to noise levels in excess of permissible levels to be conducted on an annual basis or as recommended by an audiologist or occupational physician;
- (c) a hearing test, within 3 months of commencement of employment, for each new worker who will be exposed to noise in excess of the permissible levels;
- (d) mandatory training and education for all workers in the health hazards of noise as well as the fitting, maintenance, care and use of hearing protection; and
- (e) where hearing protection is required, the provision of hearing protection in accordance with CSA Z94.2 "Hearing Protection Devices - Performance, Selection, Care and Use" or an equivalent standard.

(4) Upon termination of employment, a worker may request from the employer a record of noise exposure during the term of employment.

(5) A hearing conservation program shall be documented and those records shall be kept by the employer for as long as the worker remains employed by the employer.

(6) An employer shall post and maintain clearly worded signs at entrances to or on the periphery of areas where persons are exposed to noise levels in excess of 85dbA or another acceptable level.

(7) A sign referred to in subsection (6) shall clearly state that a noise hazard exists and shall describe the personal protective equipment that is required.

Painting, coating
and working with
plastics/resins

65. (1) This section applies to a workplace in which there is spraying or the use of paint or a similar coating, fibre-reinforced resin, thermoplastic material, an expandable resin form or other similar materials.

(2) An employer shall ensure that a less hazardous substance or work process is substituted for a more hazardous substance or process whenever practicable.

(3) Where a worker is exposed to paints, coatings, thinners, solvents and similar materials containing harmful ingredients, the employer shall ensure that the harmful nature of the materials is known by that worker and that safe means of handling and using the materials are followed.

(4) Spraying a flammable or other hazardous product is prohibited within a general work area unless effective controls have been installed to control the fire, explosion and toxicity hazards.

(5) Where practicable, a coating shall not be applied to a material that is about to be welded.

(6) A work area or enclosure where hazardous materials are handled or used shall be posted with suitable signs or placards warning workers of the hazards within the identified restricted access area and stating the precautions for entry into the area.

(7) Where practicable, a ventilated spray booth or other enclosure designed to control worker exposure shall be used during

- (a) an operation or process which involves spraying paint or resin;
- (b) lay-up or moulding of reinforced plastic; or
- (c) an application of a paint, coating or insulation containing a sensitizer including an isocyanate compound, or similar operations using toxic materials.

(8) The air velocity through a horizontal flow spray booth, a vertical flow, down-draft or other enclosure required by subsection (7) shall be as prescribed by a standard acceptable to the minister.

(9) In outdoor applications of materials or processes listed in subsection (7), an air velocity across the work area of at least 50 fpm shall be assured, by mechanical means if necessary, to carry vapours and aerosols away from the breathing zone of a worker.

(10) A ventilation system used to control airborne contaminants shall have electrical and mechanical systems designed to control all potential ignition sources and meet the requirements of the Canadian Electrical Code.

(11) A ventilation system subject to heavy concentrations of over-spray from the operation shall have an arrester filter which is maintained in good operating condition and replaced when the pressure drop across the filter exceeds the design criteria.

(12) A worker who is or may be exposed to an airborne contaminant generated by a spray operation involving a sensitizing agent shall be provided with and shall wear air-supplied respiratory protection.

(13) Only a qualified person authorized by the employer may operate

- (a) an airless spray unit of the type which atomizes paint and fluid at pressure;
- (b) a spray paint powered by compressed air in excess of 10 psi; or
- (c) a chopper spray gun unit.

(14) An airless spray gun shall have

- (a) a means to electrically bond the gun to the paint reservoir and pump;
- (b) a guard that will protect against trigger activation if the gun is dropped; and
- (c) a trigger function configured to require two distinct operations by the user to activate the release of paint or fluid through the nozzle, or a safety device which prevents the nozzle tip from coming into contact with the worker.

(15) Emissions from operations involved in heating plastics to temperatures which may release thermal decomposition products shall be removed from the workplace by local exhaust ventilation when there is a risk of harm to a worker from exposure to these emissions.

(16) A resin foam installation process performed indoors shall be controlled or contained so that an unprotected worker is not exposed to emissions by using an enclosure or portable local exhaust ventilation or by scheduling arrangements.

(17) A resin foam installation process performed outdoors and relying on natural ventilation shall be completed in an area restricted to authorized personnel wearing adequate personal protective equipment.

(18) Safe work procedures shall be developed for lead paint removal operations, including provisions for warning unauthorized persons, worker training, containment, ventilation, work practices, personal protective equipment worker decontamination and safe means of disposal.

PART VII PERSONAL PROTECTIVE EQUIPMENT

Definitions

66. (1) In this Part

- (a) "administrative controls" means the provision, use and scheduling of work activities and resources in the workplace, including planning, organizing, staffing and coordinating, for the purpose of controlling risk;
- (b) "engineering controls" means the physical arrangement, design or alteration of workstations, equipment, materials, production facilities or other aspects of the physical work environment, for the purpose of controlling risk;
- (c) "fit check" means a negative or positive pressure check of a respirator's fit, performed in accordance with the respirator manufacturer's instructions;
- (d) "fit test" means a quantitative or qualitative fit test performed in accordance with procedures in CSA Standard CAN/CSA-Z94.4-93 "Selection, Use, and Care of Respirators"; and
- (e) "flame resistant", in reference to clothing, means made of a material that, due to its inherent properties or as a result of treatment by a flame retardant, will slow, terminate or prevent flaming combustion.

Selection, use and maintenance

67. Personal protective equipment shall

- (a) be selected and used in accordance with recognized standards and provide effective protection;

- (b) not in itself create a hazard to the wearer;
- (c) be compatible so that one item of personal protective equipment does not make another item ineffective; and
- (d) be maintained in good working order and in sanitary condition.

Workplace evaluation

68. Where an evaluation of workplace conditions is required to determine appropriate personal protective equipment, the evaluation, where practicable, shall be done in consultation with

- (a) the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as appropriate;
- (b) a person competent in the selection and use of personal protective equipment; and
- (c) the worker who will use the equipment.

Instruction

69. An employer shall ensure that a worker who wears personal protective equipment is adequately instructed in the correct use, limitations and assigned maintenance duties for the equipment to be used.

Personal clothing and accessories

70. (1) The personal clothing of a worker shall be of a type and in a condition which will not expose the worker to an unnecessary or avoidable hazard.

(2) Where there is a danger of contact with moving parts of machinery or with electrically energized equipment, or where the work process presents similar hazards

- (a) the clothing of a worker shall fit closely about the body;
- (b) dangling neckwear, bracelets, wristwatches, rings or similar articles shall not be worn, except for medical alert bracelets which may be worn with transparent bands that hold the bracelets snugly to the skin; and
- (c) cranial and facial hair shall be confined or worn at a length which shall prevent it from being snagged or caught in the work process.

General require-
ments of safety
headgear

71. (1) Safety headgear shall be worn by a worker in a work area where there is a danger of head injury from falling, flying or thrown objects, or other harmful contacts.

(2) Safety headgear shall meet the requirements of CSA Standard CAN/CSA-Z94.1 "Industrial Protective Headwear" or, in the case of emergency response personnel, the applicable National Fire Protection Association Standard.

Eye and face pro-
tection

72. Where a worker handles or is exposed to materials or conditions that are likely to injure or irritate the eye or face, an employer shall ensure that he or she wears properly fitting face and eye protection appropriate to the conditions of the workplace and in accordance with the requirements of CSA Standard CAN/CSA Z94.3 "Industrial Eye and Face Protectors".

Prescription safety
eyewear

73. (1) Prescription safety eyewear shall meet the requirements of CSA Standard CAN/CSA Z94.3 "Industrial Eye and Face Protectors".

(2) Bifocal and trifocal glass lenses shall not be used where there is a danger of impact unless such lenses are worn behind impact-rated goggles or other eye protection acceptable to the minister.

(3) Where the use of polycarbonate or plastic prescription lenses is impracticable due to the conditions of the workplace and there is no danger of impact, a worker may use prescription lenses made of treated safety glass meeting the requirements of ANSI Standard Z87.1 "Practice for Occupational and Educational Eye and Face Protections".

Contact lenses

74. Adequate precautions shall be taken where a hazardous substance or condition may adversely affect a worker wearing contact lenses.

General require-
ments of limb and
body protection

75. Where there is a danger of injury, contamination or infection to a worker's skin, hands, feet or body, the worker shall wear properly fitting protective equipment appropriate to the work being done and the hazards involved.

Leg protection

76. (1) A worker operating a chain saw shall wear approved leg protection, including ballistic nylon pants.

(2) A leg protective device shall have a label permanently affixed to the outer surface of the device indicating the standard it meets.

77. (1) A worker shall wear CSA Standard Z195 "Protective Footwear" appropriate to the hazards encountered where there is danger of injury to the worker's feet.

(2) Where a workplace has slippery surfaces, appropriate non-slip footwear shall be worn.

78. A worker whose duties are regularly performed in areas and under circumstances where he or she is exposed to the danger of moving vehicles or heavy equipment shall wear distinguishing apparel containing highly visible material suitable for daytime or night time use, as appropriate.

79. A worker shall wear flame resistant clothing appropriate to the risk when working in areas where he or she may be exposed to flash fires, arc flash, molten metal, or similar hot work hazards.

80. (1) Where required, an employer shall establish and maintain a respiratory protection program in accordance with CSA Standard Z94.4 "Selection, Use and Care of Respirators".

(2) The respiratory protection program shall be updated as necessary to reflect the changes in workplace conditions that affect the use of respiratory protection equipment.

(3) An employer shall establish and implement those elements of a written respiratory protection program necessary to ensure that an employee using respiratory protection equipment is medically fit to do so.

81. (1) When a worker is or may be exposed to an oxygen deficient atmosphere or harmful concentrations of air contaminants, atmospheric contamination shall be prevented to the extent practicable by accepted engineering controls and when engineering or other controls are not practicable, appropriate respiratory protection equipment shall be used in accordance with this section.

(2) Respiratory protection equipment shall be provided by an employer when the equipment is necessary to protect the health of a worker.

(3) An employer shall ensure that compressed air, compressed oxygen, liquid air and liquid oxygen used for respiration comply with the specifications of CSA Code Z180.1.

(4) An employer shall ensure that compressed oxygen is not used in atmosphere-supplying respiratory equipment that has previously used compressed air.

(5) Access points shall display signs warning that respiratory protection equipment is required and naming the contaminant or hazard involved.

(6) An employer shall ensure that sufficient workers who are trained in rescue procedures are immediately available whenever workers are working in areas where an oxygen deficient atmosphere or hazardous contaminants may be present.

(7) A rescue worker referred to in subsection (6) shall have immediate access to appropriate breathing apparatus or other aids necessary to effect a rescue.

Respiratory protection equipment

82. (1) An employer shall select and provide appropriate respiratory protection equipment based on the respiratory hazard to which a worker is exposed and workplace and user factors that affect the performance and reliability of the equipment.

(2) The equipment referred to in subsection (1) shall be certified by the National Institution of Occupational Safety and Health and used in compliance with the conditions of its certification.

(3) An employer shall identify and evaluate the respiratory hazard in the workplace, and the evaluation shall include an employee's potential exposure to respiratory hazards and an identification of the contaminant's chemical composition and physical state.

(4) Where an employer cannot identify the exposure referred to in subsection (3), the employer shall consider the atmosphere to be an immediate danger to life and health.

(5) An employer shall not permit a respirator with a tight-fitting facepiece to be worn by an employee who has

- (a) facial hair that comes between the sealing surface of the facepiece and the face, or that interferes with valve function; or
- (b) a condition that interferes with the face to facepiece seal or valve function.

(6) Where an employee wears corrective glasses or goggles or other personal protective equipment, the employer shall ensure that the equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

(7) Where a tight-fitting respirator is used by an employee, an employer shall ensure that the employee performs a user seal check prior to each use.

Inspection and
maintenance of
respiratory protec-
tion equipment

83. (1) Respiratory protection equipment that is issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to maintain it in a sanitary condition.

(2) Respiratory protection equipment that is issued for the use of more than one employee shall be cleaned and disinfected before being worn by different individuals.

(3) An employer shall ensure that respiratory protection equipment is inspected as follows:

- (a) equipment used in routine situations shall be inspected prior to each use and after cleaning;
- (b) equipment maintained for use in emergency situations shall be inspected at least once monthly and according to the manufacturer's recommendations, and shall be checked for proper function prior to and after each use; and
- (c) emergency escape only equipment shall be inspected prior to being carried into the workplace for use,

and where inspection reveals damage, equipment shall be discarded.

PART VIII MACHINERY AND EQUIPMENT

Definitions

84. In this Part

- (a) "guard" means a type of safeguard consisting of a physical barrier which prevents a worker from reaching over, under, around or through the barrier to a moving part or point of operation;
- (b) "point of operation" means the danger area in a machine where a part is being formed or work is being done;
- (c) "power transmission part" means any moving part of a machine that transfers power from a power source to a point of operation;
- (d) "safeguard" means the use of a guard, a safety device, a shield, an awareness barrier, warning signs, or other appropriate means, either singly or in combination, to provide effective protection to workers from hazards;
- (e) "safety device" means a type of safeguard consisting of an arrangement of operating controls, an active or passive physical restraint, an interlock, or a presence sensing device which ensures that a worker cannot access or be in a hazardous area while a machine is operating; and
- (f) "shield" means a type of safeguard consisting of a physical cover or barrier which restricts but does not prevent access to a hazardous moving part or a point of operation.

Safe machinery and equipment

85. (1) An employer shall ensure that each tool, machine and piece of equipment in the workplace is

- (a) capable of safely performing the functions for which it is used; and
- (b) selected, used and operated in accordance with
 - (i) the manufacturer's recommendations and instructions, where available,

(ii) safe work practices, and

(iii) the requirements of these regulations.

(2) Except as otherwise provided in these regulations, the installation, inspection, testing, repair and maintenance of a tool, machine or piece of equipment shall be carried out

(a) in accordance with the manufacturer's instructions and any standard the tool, machine or piece of equipment is required to meet; or

(b) as specified by a professional engineer.

(3) Where equipment or a structure is dismantled in whole or in part and subsequently reassembled, it shall not be used until completely checked and found to be safe for operation or occupancy.

(4) Except as otherwise provided in these regulations, modification of a tool, machine or piece of equipment shall be carried out in accordance with

(a) the manufacturer's recommendations and instructions, where available;

(b) safe work practices; and

(c) the requirements of these regulations.

General require-
ments

86. Except as otherwise provided in these regulations, an employer shall ensure that machinery and equipment is fitted with adequate safeguards that

(a) protect an employee from contact with hazardous power transmission parts;

(b) ensure that an employee cannot access a hazardous point of operation; and

(c) safely contain any material ejected by the work process that could be hazardous to an employee.

Standards

87. (1) The application, design, construction and use of safeguards, including an opening in a guard and the reach distance to a hazardous part, shall meet the requirements of CSA Standard Z432-94 "Safe-guarding of Machinery".

(2) A safeguard shall be capable of effectively performing its intended function.

Guards

88. (1) A fixed guard shall not be modified to be readily removable without the use of tools.

(2) A guard shall be designed, where practicable, to allow lubrication and routine maintenance without the removal of the guard.

Identifying unsafe equipment

89. An unsafe tool, machine or piece of equipment shall be removed from service and identified in a manner that will ensure that it is not inadvertently returned to service until it has been made safe for use.

Operating controls

90. (1) Powered equipment other than portable powered tools or mobile equipment shall have

- (a) starting and stopping controls located within easy reach of the operator;
- (b) controls and switches clearly identified to indicate the functions that they serve;
- (c) controls positioned, designed or shielded to prevent inadvertent activation;
- (d) where two-hand controls are installed, controls designed to require concurrent use of both hands to operate the equipment, and to require both controls to be released before another machine cycle can be initiated; and
- (e) control systems meeting the requirements of these regulations.

(2) Portable powered tools and mobile equipment shall have operating controls that conform to an appropriate standard acceptable to the minister.

91. A machine shall be located or safeguarded so that operation of the machine does not endanger a worker using a normal passage route about the workplace or operating an adjacent machine.

92. A physical hazard shall be identified and marked in a manner that clearly identifies the hazard to the affected worker in accordance with acceptable standards as applicable:

- (a) CSA Standard for Signs and Symbols for the Workplace;
- (b) ANSI Standard for Safety Color Code;
- (c) ANSI Standard for Environmental and Facility Safety Signs;
- (d) ISO Standard for Safety Colors and Safety Signs; or
- (e) National Standards of Canada CAN 3-Z321 "Signs and Symbols for the Occupational Environment".

93. A piping system containing substances shall be clearly identified in a manner known to the affected worker and the identification markings on a piping system shall be maintained in a legible condition.

94. Effective means of restraint shall be used

- (a) on a connection of a hose or a pipe where inadvertent disconnection could be dangerous to a worker;
- (b) where unplanned movement of an object or component could endanger a worker; or
- (c) to secure an object from falling and endangering a worker.

95. Where a worker may be exposed to contact with rotating parts, such as friction drive, shafts, couplings and collars, set screws and bolts, keys and keyways, and projecting shaft ends, the parts shall be guarded.

96. A pit for a flywheel or pulley shall have curbs or toeboards around the upper edge of the pit.

97. (1) Except as otherwise provided in these regulations, a conveyor shall meet the requirements of ANSI Standard ANSI/ASME B20.1-1993 "Safety Standards for Conveyors and Related Equipment".

(2) A conveyor shall have guards or sideboards to prevent material from falling from the conveyor into areas occupied by workers where the falling material creates a risk of injury.

(3) A conveyor shall have an emergency stopping system except where worker access to the conveyor is prevented by guarding.

(4) Where a conveyor emergency stopping system uses a pull wire, the system shall activate by a pull of the wire in any direction, or by a slack cable condition.

(5) A conveyor emergency stopping system shall be designed and installed so that after an emergency stop manual resetting is required before the conveyor can be restarted.

(6) A conveyor shall not be restarted after an emergency stop until inspection has determined it can be operated safely.

Power presses,
brake presses and
shears

98. Point of operation safeguarding, and the design, construction and reliability of the operating controls of a power press, brake press, ironworker or shear shall meet the requirements of the following applicable standard:

(a) CSA Standard CAN/CSA-Z142-M90 "Code for Punch Press and Brake Press Operation: Health, Safety, and Guarding Requirements";

(b) ANSI Standard B11.4-1993 "American National Standard for Machine Tools -- Shears -- Safety Requirements for Construction, Care, and Use"; or

(c) ANSI Standard B11.5-1988 (R1994) "American National Standard for Machine Tools -- Ironworkers -- Safety Requirements for Construction, Care, and Use".

Exception for
custom work

99. The safeguarding for the point of operation of a brake press may be removed upon application to and approval by the division where custom or different bends are being done with each cycle of the ma-

chine, provided that safe work procedures are followed, and safeguarding is replaced upon completion of such custom work.

Cutting and cooling
material contain-
ment

100. Cutting or cooling fluids, metal chips and turnings from machine tool work shall be contained.

Standards for abra-
sive equipment

101. An abrasive wheel shall be guarded, used and maintained to meet the requirements of ANSI Standard B7.1-1988 "The Use, Care and Protection of Abrasive Wheels".

Powder actuated
tools standards

102. A powder actuated fastening system, consisting of the tool, power loads and fasteners, shall meet the requirements of:

- (a) ANSI Standard A10.3-1995 "American National Standard for Construction and Demolition Operations -- Safety Requirements for Powder-Actuated Fastening Systems";
- (b) CSA Standard for Powder Actuated Devices; or
- (c) other authority acceptable to the minister.

Powder actuated
tool use

103. (1) A low velocity powder actuated tool, with a fastener test speed rating of less than 100 metres per second, shall be used unless no low velocity tool available on the market is capable of doing the fastening task.

(2) Two separate and distinct operations shall be required to activate a powder actuated tool and the final firing movement shall be separate and subsequent to depressing the tool into the firing position.

(3) A powder actuated tool shall be designed so that positive means of varying the power level is available, or can be made available, to enable the operator to select a power level appropriate to perform the desired work.

(4) A powder actuated tool shall be marked with the manufacturer's name or trademark, model number and serial number.

(5) When not in use, a powder actuated tool shall be unloaded and the tool and power loads shall be securely stored and be accessible only to qualified and authorized persons.

(6) Powder loads of different power levels and types must be kept in different compartments or containers.

(7) Only a qualified person may handle or use a powder actuated tool or powder loads.

(8) When using or servicing a powder actuated tool, an operator shall have immediately available

(a) a copy of the manufacturer's operating instructions for the tool;

(b) a copy of the powder load and fastener charts for the tool; and

(c) accessories or tools needed for use or field servicing of the tool, including personal protective equipment.

(9) A powder actuated tool shall not be used in an explosive or flammable atmosphere.

(10) A powder actuated tool may only be loaded when it is being prepared for immediate use, and shall be unloaded at once if work is interrupted after loading.

(11) A powder actuated tool shall not be pointed at any person.

(12) Where a powder actuated tool misfires, the operator shall hold the tool firmly against the work surface for at least 5 seconds, then follow the manufacturer's instructions for such occurrences, and until the cartridge has been ejected, keep the tool pointed in a direction which will not cause injury to any person.

Limitations on use
of powder actuated
tools

104. (1) A powder actuated tool fastener shall not be driven into very hard or brittle materials, such as cast iron, glazed tile, hardened steel, glass block, natural rock, hollow tile, and most brick.

(2) A powder actuated tool fastener may only be driven into easily penetrated or thin materials or materials of unknown resistance where the receiving material is backed by a material that will prevent the fastener from passing completely through.

(3) A powder actuated tool fastener shall not be driven into steel within 13 millimetres of an edge, or within 5 centimetres of a weld except for special applications permitted by the manufacturer.

(4) Except for special applications recommended by the manufacturer, a powder actuated tool fastener may not be driven into masonry materials

(a) within 7.5 centimetres of an unsupported edge with a low velocity tool; or

(b) within 15 centimetres of an unsupported edge with a medium or high velocity tool.

(5) A powder actuated tool fastener shall not be driven

(a) into concrete unless material thickness is at least 3 times the fastener shank penetration;

(b) into any spalled area; or

(c) through existing holes unless a specific guide means, as recommended and supplied by the manufacturer, is used to assure positive alignment.

Chippers

105. (1) A hand-fed mobile chipper shall have a barrier or baffle installed on the feed side of the rotor to prevent ejection of chipped material.

(2) A self-feeding chipper shall have a table or apron extending at least 1.5 metres back from the rotor with sides sufficiently high to prevent a worker from reaching in and contacting the rotating knife.

(3) A driven-feed chipper shall have a guard chute or apron extending at least 90 centimetres from the feed rollers and a panic bar to stop the feed rollers.

(4) On a mobile chipper which gravity feeds material through a vertical hopper to the rotor, the sides of the hopper shall be of a sufficient depth to prevent the operator from reaching in so as to contact the rotor, but in no case not less than 90 centimetres measured from the top edge of the hopper to the periphery of the rotor.

Chain saws

106. (1) A chain saw shall meet the requirements of CSA Standard Z62.1-95 "Chain Saws".

(2) A chain saw shall have a chain brake that activates automatically upon kickback regardless of the position of the power head or operator's hands.

(3) A chain saw chain shall be stopped before the saw operator moves from cut to cut, unless the next cut is in the immediate area and the saw operator can safely move to the next cutting position.

Automotive lifts
and vehicle supports

107. (1) An automotive lift or hoist shall meet the requirements of ANSI Standard ANSI/ALI B153.1-1990 "American National Standard for Automotive Lifts -- Safety Requirements for the Construction, Care, and Use".

(2) A shop crane, jack, axle stand, ramp or other type of vehicle support shall meet the requirements of the applicable section of ANSI Standard ASME PALD-1993 "Portable Automotive Lifting Devices".

(3) Operation, inspection, repair, maintenance and modification of a vehicle support or lift shall be carried out according to the manufacturer's instructions or the written instructions of a professional engineer.

(4) The employer shall keep a maintenance and inspection record for each automotive lift or hoist.

(5) The rated capacity shall be marked on each automotive lift or hoist, shop crane, jack, axle stand, ramp or other vehicle support and shall not be exceeded.

(6) The control for an automotive lift shall require continuous pressure by the operator when raising or lowering the unit, and the control must return to the neutral position when released.

Pneumatic nailing
and stapling tools

108. (1) A hand held pneumatic nailing or stapling tool capable of driving fasteners larger than 1.2 millimetres (18 gauge ASWG) shall not activate unless the operator performs 2 actions, one of which is to place the tool against a work surface.

(2) The trigger of a pneumatic nailing or stapling tool shall not be taped or otherwise secured in the "on" position, or held in the "on" position while moving between operations.

(3) The air supply to a pneumatic nailing or stapling tool shall be disconnected before adjusting or servicing the tool.

Drilling equipment -
general require-
ments

109. An employer shall ensure that before drilling

- (a) the back, face and sides of the work area have been scaled and stabilized;
- (b) the working face and surrounding area have been thoroughly washed; and
- (c) remnants of holes have been inspected for explosives and distinctively marked.

Drilling equipment
use

110. (1) An employer shall ensure that

- (a) a rock drill is not used unless equipped with a water jet or other device capable of suppressing rock dust; and
- (b) adequate restraining devices are installed on hose connections under pressure, if inadvertent disconnection could endanger workers.

(2) Operating controls shall not be installed on the feed side of a top-hammer percussion drill.

Drilling procedures

111. A driller shall ensure that

- (a) the cut is not drilled in the same location as the previous round;
- (b) holes are not drilled within 15 centimetres of any part of a bootleg; and
- (c) there is no drilling at a face when a hole is loaded or being loaded with explosives except in conformity with the requirements on drilling to re-fire a misfire, as specified in PART XIX.

112. (1) A drill operator shall not manually add or remove drill steel, a drill bit or service drilling equipment while the drill is rotating under power.

Rod handling

(2) A worker assisting the drill operator with drill bit or drill steel handling shall remain clear of rotating parts of the drill system.

(3) Except as provided in subsection (4), a boom-mounted percussion drill being used with multiple lengths of coupled drill steel shall have a rod changer or other effective device installed and used to add or remove drill steel.

(4) Where it is not practicable to fit a rod changer to a boom-mounted percussion drill, adequate written safe work procedures for adding and removing drill steel shall be available and the drill shall be operated in accordance with those procedures.

Self-propelled drills

113. (1) An operator or other worker may only ride on a self-propelled drill if in a safe position inside a roll over protective structure.

(2) Where there is no roll over protective structure, the drill shall have controls for machine travel located to allow the operator to move the machine from a position off the machine and clear of any hazard should the drill roll or slide downhill.

Cleaning drilled holes

114. Where a drilled hole is being cleaned using an air or water pressure blowpipe, the operator shall ensure that all persons are clear of the area made hazardous by blowback.

Abrasive blasting and high pressure washing definitions

115. For purposes of this section and sections 116 to 123,

- (a) "cabinet" means an enclosure designed to permit abrasive blasting, high pressure washing or a similar operation to be conducted safely inside the enclosure by a worker who is outside the enclosure;
- (b) "enclosure" means a temporary or permanent enclosure of a work area provided with exhaust ventilation and makeup air to reduce exposure of workers inside the enclosure and prevent the uncontrolled release of air contaminants from the enclosure; and

- (c) "high pressure washing" or "jetting" means the use of water or other liquid delivered from a pump at a pressure exceeding 34 MPa (5,000 psi), with or without the addition of solid particles, to remove unwanted matter from a surface or to penetrate into the surface of a material for the purpose of cutting that material.

Risk assessment

116. An employer shall ensure that a risk assessment is done before any abrasive blasting activity, high pressure washing process, or related cleanup is started which may cause release of a harmful level of an air contaminant from a surface or coating containing a toxic heavy metal or hazardous substance.

Work procedures
outside a cabinet

117. Where abrasive blasting, high pressure washing or a similar operation is conducted by a worker outside a cabinet, written safe work procedures addressing the hazards and necessary controls shall be prepared and implemented by the employer.

Substitution and
prohibition on reuse

118. Abrasive blasting materials containing crystalline silica shall be replaced with less toxic materials, where practicable.

Cleanup

119. (1) Used abrasive blasting materials which contain a hazardous substance shall be removed from the work area by a worker using effective procedures designed to minimize the generation of airborne dust and wearing suitable personal protective equipment.

(2) Removal under subsection (1) shall take place by the end of each shift except where

- (a) a risk assessment establishes that the risks from removal will exceed the risks from leaving the materials in place;
- (b) a worker will not be exposed to the materials before removal occurs; or
- (c) the materials cannot be separated from the environment in which the abrasive blasting takes place.

(3) Where removal is delayed under subsection (2), an employer shall assess the risks arising from delay and develop written safe work procedures.

Engineering controls

120. Engineering controls such as an enclosure or local exhaust ventilation with dust collection shall be used to maintain airborne contaminant levels below exposure limits, where practicable.

Exhaust ventilation

121. (1) Where abrasive blasting or a similar operation is conducted within a structure, the process shall be isolated in a separate, properly ventilated enclosure or cabinet to minimize worker exposure to air contaminants generated by the process.

(2) Where abrasive blasting or a similar operation is conducted inside an enclosure or cabinet, the enclosure or cabinet shall have exhaust ventilation that

(a) maintains air pressure below the air pressure outside the enclosure or cabinet, so as to prevent the escape of air contaminants from the enclosure or cabinet to other work areas; and

(b) minimizes worker exposure inside the enclosure.

Restricted work zones

122. (1) Where abrasive blasting or a similar operation is conducted outside a structure, the process shall be restricted to a work zone which is identified by signs or similar means as being a contaminated area.

(2) Only a properly protected worker who is necessary to perform the work shall be permitted inside an enclosure or a restricted work zone where abrasive blasting or a similar operation is conducted.

Operating procedures

123. (1) The operating controls for a sandblasting machine or jetting gun shall be

(a) located near the nozzle in a position where the operator's hands will be when using the device;

(b) a continuous pressure type that immediately stops the flow of material when released; and

(c) protected from inadvertent activation.

(2) Where hand operated controls are impracticable, subsection (1)(a) does not apply and an operator shall use a foot operated control or equivalent safety device, of a design acceptable to the minister.

(3) A jetting gun shall not be modified except as authorized by the manufacturer.

(4) A worker shall not hand hold an object while it is being cleaned or cut by a jetting gun.

(5) High pressure hoses, pipes, and fittings shall be supported to prevent excessive sway and movement.

(6) A nozzle or jetting gun operator shall wear personal protective clothing and equipment on the body, hands, arms, legs and feet, including the metatarsal area, made of canvas, leather or other material which will protect the worker's skin from injury in the event of contact with the flow from the nozzle.

(7) Except where the process is isolated from the operator in a separate cabinet, suitable respiratory protective equipment shall be provided and worn whenever abrasive blasting or a similar operation is conducted.

PART IX DE-ENERGIZATION AND LOCKOUT

Definitions

124. In this Part,

- (a) "control system isolating device" means a device that physically prevents activation of a system used for controlling the operation of machinery or equipment;
- (b) "energy isolating device" means a device that physically prevents the transmission or release of an energy source to machinery or equipment;
- (c) "energy source" means an electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other source of energy of potential harm to workers;
- (d) "key securing system" means a system which physically prevents access to keys when locks or positive sealing devices are applied in a group lockout procedure;

- (e) "lockout" means the use of a lock to render machinery or equipment inoperable or to isolate an energy source in accordance with written procedure;
- (f) "maintenance" means work performed to keep machinery or equipment in a safe operating condition, including installation, repair, cleaning, lubrication and the clearing of obstructions;
- (g) "normal production" means work that is routine, repetitive, and integral to the normal use of machinery or equipment for production; and
- (h) "personal lock" means a lock provided by the employer for use by a worker to ensure personal lockout protection such that each lock, when applied, is operable only by a key in the worker's possession, and by a key under the control of the supervisor or manager in charge.

General require-
ment

125. Where the unexpected energization or startup of machinery or equipment or the unexpected release of an energy source could cause injury, the energy source shall be isolated and effectively controlled.

When lockout
required

126. (1) Where machinery or equipment is shut down for maintenance, no work may be done until

- (a) all parts and attachments have been secured against inadvertent movement;
- (b) where the work will expose workers to energy sources, the hazard has been effectively controlled; and
- (c) the energy isolating devices have been locked out as required by this Part.

(2) Where machinery or equipment is in use for normal production work, subsection (1) applies if a work activity creates a risk of injury to workers from the movement of the machinery or equipment, or exposure to an energy source, and the machinery or equipment is not effectively safeguarded to protect the workers from the risk.

Lockout procedures

127. (1) Where lockout of energy isolating devices is required, the devices shall be secured in the safe position using locks in accordance

with procedures that are made available to all workers who are required to work on the machinery or equipment.

(2) An employer shall ensure that each worker required to lock out has ready access to sufficient personal locks to implement the required lockout procedure.

(3) Combination locks shall not be used for lockout.

(4) A personal lock shall be marked or tagged to identify the person applying it.

(5) Procedures shall be implemented for shift or personnel changes, including the orderly transfer of control of locked-out energy isolating devices between outgoing and incoming workers.

(6) Where the use of a personal lock is not practicable for lock-out, other effective means approved by the minister may be used in place of a personal lock to secure an energy isolating device in the safe position.

(7) Where an energy isolating device is locked out, the lock shall not prevent access to other energy isolating devices supplying machinery or equipment that could cause injury to workers.

Checking locked
out equipment

128. (1) Effective means of verifying lockout shall be provided and used.

(2) Prior to commencing work, a worker shall verify that all energy sources have been effectively locked out.

Worker responsi-
bilities

129. (1) A worker who works on machinery or equipment requiring lockout is responsible for

- (a) locking out the energy isolating devices prior to starting work except as provided by section 131;
- (b) removing personal locks on the completion of his or her work; and
- (c) maintaining immediate control of the key to personal locks throughout the duration of the work.

Removal of locks

130. (1) A personal lock shall only be removed by the worker who installed it, or where this is not possible, the matter shall be referred to the supervisor who shall be responsible for its removal.

(2) A supervisor shall

- (a) make every reasonable effort to contact the worker who installed the lock;
- (b) ensure that the machinery or equipment can be operated safely prior to removing the lock; and
- (c) ensure that locks that are not in active use are removed from machinery or equipment.

(3) A worker shall be notified at the start of his or her next shift where the worker's personal lock has been removed since the worker's previous shift.

Group lockout procedure

131. (1) Where a large number of workers are working on machinery or equipment or a large number of energy isolating devices are to be locked out, a group lockout procedure that meets the requirements of this section may be used.

(2) In a group lockout procedure, 2 qualified workers shall be responsible for

- (a) independently locking out the energy isolating devices;
- (b) securing the keys for the locks used under paragraph (a) with personal locks or other positive sealing devices acceptable to the minister; and
- (c) completing, signing and posting a checklist that identifies the machinery or equipment components covered by the lockout.

(3) Prior to commencing work, a worker working on the locked out components shall apply a personal lock to the key securing system referred to in paragraph (2)(b).

(4) Workers may lock out a secondary key securing system where 2 qualified workers lock out the primary key securing system and place their keys in the secondary system.

(5) On completion of his or her work, a worker referred to in subsections (3) and (4) shall remove his or her personal lock from the key securing system.

(6) Where the requirements of subsection (5) have been met and it has been determined that it is safe to end the group lockout, 2 qualified workers shall be responsible for removing their personal locks or the positive sealing device from the key securing system containing the locks referred to in paragraph (2)(a), and when those keys are released, the system is no longer considered to be locked out.

(7) The written group lockout procedure shall be conspicuously posted at the place where the system is in use.

Alternative procedures

132. (1) Where lockout of energy isolating devices as required by section 126 is not practicable,

- (a) in the case of a power system as defined in Part XXI, the requirements of that Part shall be followed;
- (b) in the case of mobile equipment as defined in Part XII, the requirements of that Part shall be followed;
- (c) in the case of machinery equipment designed and equipped with effective control system isolating devices, the devices shall be locked out as required by sections 127 to 131 and subsection (2); and
- (d) in an emergency, the energy isolating devices or control system devices shall be effectively controlled to prevent inadvertent start-up or hazardous energy release.

(2) Control system isolating devices and the procedures for their use shall be approved in writing by the minister and shall be used by a qualified worker authorized to carry out the work.

Where locks not required

133. The application of a lock is not required under section 126 or 132 where

- (a) the energy isolating device is under the exclusive and immediate control of the worker at all times while working on the machinery or equipment; or
- (b) a tool, machine or piece of equipment that receives power through a readily disconnected supply, such as an electrical cord or quick release air or hydraulic line, is disconnected from its power supply and its connection point is kept under the immediate control of the worker at all times while the work is being done.

Work on energized
equipment

134. Where it is not practicable to shut down machinery or equipment for maintenance, only the parts which are vital to the process may remain energized and the work shall be performed by a qualified worker who has been authorized by the employer to do the work and provided with and follows written safe work procedures.

PART X FALL PROTECTION

Definitions

135. In this Part,

- (a) "anchor point" means a secure point of attachment for a lifeline or lanyard;
- (b) "arborist" means a worker trained and employed, in whole or in part, to climb trees for an economic or scientific purpose, including
 - (i) detection and treatment of disease, infections or infestations,
 - (ii) pruning, spraying or trimming,
 - (iii) repairing damaged trees,
 - (iv) assessing growth or harvesting potential, or
 - (v) scientific research;
- (c) "debris net" means a net that is used to catch material and debris that can drop from work areas;

- (d) "fall arrest system" means a system of physical components attached to a worker that stops a worker during a fall;
- (e) "full body harness" means a harness consisting of leg and shoulder straps and an upper back suspension unit that will distribute and reduce the impact force of a fall;
- (f) "guardrail" means a temporary system of vertical and horizontal members that warns of a fall hazard and reduces the risk of a fall;
- (g) "lanyard" means a flexible line used to secure a worker to a lifeline, a static line or a fixed anchor point;
- (h) "lifeline" means a vertical line attached to a fixed anchor point or a static line and to which a lanyard and a ropegrab may be attached;
- (i) "means of fall protection" means a harness, net, rope, safety belt, structure or other equipment or device or means of
 - (i) restraining a worker who is at risk of falling, or
 - (ii) stopping a worker who has fallen;
- (j) "personnel safety net" means a net that is used to catch a worker during a fall;
- (k) "ropegrab" means a mechanical fall-arrest device that
 - (i) is attached to a lifeline and a lanyard, and
 - (ii) locks itself immediately on the lifeline in the event of a fall;
- (l) "safe surface" means a surface at a workplace that
 - (i) has sufficient size and strength to adequately support a worker who falls on to the surface, and
 - (ii) is sufficiently horizontal to prevent a further fall from the surface by a worker who has fallen on to the surface;

- (m) "safety belt" means a belt worn by a worker as a means of fall protection;
- (n) "softener" means padding or hoses that are used with a life-line or static line to prevent a rope from being cut or chafed; and
- (o) "static line" means a rope
 - (i) that is attached horizontally to 2 or more fixed anchor points, and
 - (ii) to which a fall arrest system is attached.

General require-
ments

136. Where a worker is exposed to the hazard of falling from a work area that is

- (a) 3 metres or more above the nearest safe surface or water;
- (b) above a surface or thing that could cause injury to the worker if the worker were to fall on the surface or thing; or
- (c) above an open tank, pit or vat containing hazardous material,

the employer shall ensure that

- (d) the worker is provided with a fall arrest system that meets the requirements of section 137;
- (e) a guardrail that meets the requirements of section 28 is constructed or installed at the work area;
- (f) a personnel safety net that meets the requirements of section 138 is installed at the work area;
- (g) temporary flooring that meets the requirements of section 141 is constructed or installed at the work area; or
- (h) the worker is provided with another means of fall protection that provides a level of safety equal to or greater than a fall arrest system that meets the requirements of section 137.

137. (1) A fall arrest system that is provided in accordance with section 136 shall

- (a) be adequately secured to
 - (i) an anchor point, or
 - (ii) a lifeline that is
 - (A) securely fastened to anchor points, or
 - (B) attached to a static line that is securely fastened to anchor points and that is capable of withstanding either the maximum load likely to be imposed on the anchor point or a load of 17.8 kiloNewtons, whichever is the greater;
- (b) include a lanyard
 - (i) that is attached to an anchor point or lifeline, where practicable, above the shoulder of the worker, and
 - (ii) that complies with CSA Standard Z259.1-95 "Safety Belts and Lanyards";
- (c) prevent a free fall greater than 1.22 metres where
 - (i) the fall arrest system is not equipped with a shock absorption system that complies with CSA Standard Z259.11-M92 "Shock Absorbers for Personal Fall-Arrest Systems" and that reduces the shock level of a fall to less than 4 kiloNewtons, or
 - (ii) the combined free fall and shock absorbed deceleration distance exceeds the distance between the work area and a safe surface; and
- (d) include a full body harness that
 - (i) is attached to a lanyard,
 - (ii) is adjusted to fit the user of the harness, and

(iii) complies with CSA Standard Z259.10-M90 "Full Body Harnesses".

(2) Where a fall arrest system includes a lifeline, the lifeline shall

- (a) comply with CSA Standard Z259.2.1-98 "Fall Arresters, Vertical Lifelines and Rails";
- (b) extend to a safe surface below the work area;
- (c) be secured at the bottom of the lifeline to prevent tangling or disturbance of the line;
- (d) be securely attached to an anchor point;
- (e) be free of knots, lubricants and imperfections;
- (f) be free of splices, except as are necessary to connect the lifeline to an anchor point;
- (g) be provided with softeners at all sharp edges or corners to protect against cuts or chafing; and
- (h) be clearly identified as a lifeline by colour or by another means that provides an equivalent level of safety.

(3) No worker shall

- (a) use a lifeline in a fall arrest system while that fall arrest system is being used by another worker; or
- (b) provide a rope for use, or permit a rope to be used, as a lifeline in a fall arrest system if the rope has been used for another purpose.

(4) Where a fall arrest system provided to a worker includes a ropegrab, the ropegrab used shall comply with CSA Standard Z259.2.1-98 "Fall Arresters, Vertical Lifelines and Rails".

(5) An employer who provides a worker with a fall arrest system shall ensure the fall arrest system is inspected by a qualified person prior to each work shift undertaken by the worker.

(6) A qualified person who carries out an inspection of a fall arrest system shall advise the employer where a component of the system is defective in condition or function and the employer shall ensure that the system is not used until the defective component is replaced or repaired.

(7) Where a fall arrest system has arrested the fall of a worker at a work area, the employer shall ensure that the fall arrest system

- (a) is removed from service and inspected by a qualified person; and
- (b) is repaired, before it is reused, to the original manufacturer's specifications, where an inspection under paragraph (a) reveals that a component of the system is defective.

(8) Where a fall arrest system includes a static line, the static line shall

- (a) have a nominal diameter of at least 12.7 millimetres;
- (b) be equipped with vertical supports at least every 9 metres;
- (c) have a maximum deflection, when taut, of no greater than 381 millimetres for a 9 metre span;
- (d) be equipped with turnbuckles or other comparable tightening devices that provide an equivalent level of protection, at the ends of the static line;
- (e) be made of improved plow wire rope;
- (f) be equipped with softeners at all sharp edges or corners to protect against cuts or chafing;
- (g) be made only of components that are able to withstand either the maximum load likely to be imposed on the components or a load of 8 kiloNewtons, whichever is the greater; and
- (h) comply with CSA Standard Z259.13.04 "Flexible Horizontal Lifeline Systems" and CSA Standard Z259.16-04 "Design of Active Fall Protection Systems".

(9) Where a fall arrest system is provided to an arborist, the fall arrest system shall

- (a) include a tree climbing or tree trimming harness or saddle;
- (b) be adequately secured to
 - (i) an anchor point, or
 - (ii) a lifeline that is
 - (A) securely fastened to anchor points, or
 - (B) attached to a static line that is securely fastened to anchor points;
- (c) include a climbing rope or safety strap;
- (d) where practicable, include a second climbing rope or safety strap that
 - (i) provides additional stability, and
 - (ii) back-up fall protection; and
- (e) be capable of withstanding either the maximum load likely to be imposed or a load of 17.8 kiloNewtons, whichever is the greater.

(10) Where an employer uses a fall arrest system or a personnel safety net as a means of fall protection, the employer shall have a written fall protection plan that specifies

- (a) the procedure to assemble, maintain, inspect, use and disassemble the fall arrest system or personnel safety net; and
- (b) the procedure for the rescue of a worker who has fallen and is suspended by the fall arrest system or personnel safety net, but is unable to effect self-rescue.

Nets

138. (1) Where a personnel safety net is installed in accordance with section 136, an employer shall ensure that it

(a) is installed

(i) not more than 4.6 metres below the work area,

(ii) to ensure that no obstructions or intervening members may be struck by a worker during a fall between the work area and the personnel safety net, and

(iii) maintained so that the maximum deflection when arresting the fall of a worker does not allow any portion of the worker to contact another surface;

(b) extends 2.4 metres on all sides beyond the work area; and

(c) where connected to another personnel safety net, the splice joints connecting it with the other personnel safety nets are equal to, or greater in strength than, the strength of the weakest of the personnel safety nets.

(2) Notwithstanding subsection (1), an employer shall ensure that a personnel safety net is manufactured, used, maintained, inspected and stored in accordance with ANSI Standard A10.11-1989 "Safety Nets Used During Construction, Repair and Demolition Operations".

Debris nets

139. (1) Where a worker having access to an area below an elevated work area is exposed to the hazard of falling objects or debris from the work area, an employer shall ensure that

(a) a debris net is installed below the work area in accordance with subsection (2); or

(b) other means of protection are provided that provide an equivalent level of protection from falling objects and debris.

(2) An employer shall ensure that a debris net under subsection (1) is

(a) manufactured, used, maintained, inspected and stored in accordance with ANSI Standard A10.11-1989 "Safety Nets Used during Construction, Repair and Demolition Operations"; and

- (b) installed not more than 4.6 metres below the elevated work area.

Safety belts

140. An employer shall ensure that a safety belt provided in accordance with section 136 complies with

- (a) CSA Standard Z259.1-95 "Safety Belts and Lanyards"; or
- (b) CSA Standard Z259.3-m1978 "Lineman's Body Belt and Lineman's Safety Strap".

Temporary flooring

141. Temporary flooring that is constructed or installed in accordance with section 36 shall

- (a) be constructed or installed at each floor level of the work area where work is in progress;
- (b) extend over the whole work area except for openings necessary for the carrying out of work;
- (c) be able to withstand 4 times the maximum load likely to be imposed on it; and
- (d) be securely fastened to and supported on members that are able to withstand 4 times the maximum load likely to be imposed on them.

PART XI SCAFFOLDS, STAGES AND WORK PLATFORMS

Portable ladder standards

142. (1) Except as otherwise permitted by this Part, portable ladder design, construction and use shall meet the requirements of

- (a) CSA Standard CAN3-Z11-M81 "Portable Ladders";
- (b) ANSI Standard A14.1-1990 "Safety Requirements for Portable Wood Ladders";
- (c) ANSI Standard A14.2-1990 "Safety Requirements for Portable Metal Ladders"; or
- (d) other standard acceptable to the minister.

(2) A manufactured portable ladder shall be

(a) marked for grade and use; and

(b) used in accordance with the manufacturer's instructions.

Job built ladders

143. (1) Where a portable wooden ladder is constructed at the job site,

(a) the side rails

(i) shall be of 38 millimetres by 89 millimetres nominal dimensions for lengths up to 5 metres, and 38 millimetres by 140 millimetres nominal dimensions for lengths from 5 metres to 7.3 metres, and

(ii) shall not be notched, dapped, tapered or spliced,

and the distance between the inner faces of the side rails shall not be less than 38 centimetres or more than 50 centimetres;

(b) cleats shall be

(i) 19 millimetres by 64 millimetres for ladder lengths up to 5 metres,

(ii) 19 millimetres by 89 millimetres for ladder lengths from 5 metres to 7.3 metres,

(iii) spaced at 30 centimetres centres, and

(iv) nailed directly onto the smaller surfaces of the side rails, using three 57 millimetres wire nails on each end of the 89 millimetre cleats, and two similar nails on each end of the 64 millimetre cleats;

(c) the spaces on the side rails between the cleats shall be filled with close fitting and well secured filler pieces that are the same thickness as the cleats; and

- (d) a double cleat ladder shall have 3 rails evenly spaced, and be 107 centimetres to 127 centimetres wide and have continuous cleats which extend the full width of the ladder.

Protective coatings

144. A protective coating applied to a wooden ladder, other than a small amount for identification purposes, shall be transparent to allow defects to be discovered by inspection.

Inspection

145. Portable ladders shall be inspected before use, and ladders with loose, broken or missing rungs, split side rails or other hazardous defects shall not be used and must be removed from service.

Inclination and support

146. Where a portable single or extension ladder is in use

- (a) the ladder shall be placed so that the horizontal distance from the base to the vertical plane of support shall be approximately one-quarter of the ladder length between supports; and
- (b) the lower ends of the ladder side rails shall rest on a firm and level base and the upper support of the side rails shall be rested on a bearing surface strong enough to safely withstand the applied load.

Length

147. A ladder shall be of sufficient length to project approximately one metre above the level of the upper landing to which it provides access, except where there is limited clearance and the ladder is adequately secured.

Restrictions on use

148. (1) Except as otherwise permitted by a manufacturer, a worker shall not work from either the top 2 rungs of a portable single or extension ladder or the top 2 steps of a stepladder.

(2) A ladder shall not be used as a scaffold component or as a horizontal walkway, ramp or work platform support except where the ladder is part of a premanufactured or engineered system.

(3) A worker may only work from a portable ladder without fall protection where

- (a) the work is a light duty task of short duration at each location;

- (b) the worker's centre of gravity is maintained between the ladder side rails;
- (c) the worker will generally have one hand available to hold on to the ladder or other support; and
- (d) the ladder is not positioned near an edge or floor opening that would significantly increase the potential fall distance.

Fixed ladders

149. (1) A fixed ladder shall comply with the requirements of ANSI Standard A14.3 - 1992 "American National Standard for Ladders - Fixed Safety Requirements" or other standard acceptable to the minister.

(2) All fixed ladders more than 6.10 metres in length shall be

- (a) provided with platforms at intervals not greater than 6.10 metres;
- (b) provided with safety cages starting at 2.44 metres from the base of the ladder; and
- (c) provided with acceptable devices to prevent workers from falling.

(3) Fixed ladders shall be anchored at intervals of not more than 3.05 metres for the entire length of the ladder.

(4) A continuous clearance of at least 17.78 centimetres shall be provided at the back of rungs of fixed ladders.

(5) Ladder rungs shall be omitted above the landing and the side rails shall extend at least 91.44 centimetres above the landing.

Special purpose ladders

150. A special purpose ladder such as a ship's ladder, escape ladder, individual rung ladder or a ladder visible to the audience in a theatre scenic unit or prop shall be engineered or constructed to a standard acceptable to the minister.

Definitions

151. For the purposes of this section and sections 152 to 194,

- (a) "building tie" means a connection between a standing scaffold and a permanent structure;

- (b) "double-pole scaffold" means a scaffold with both ends of the bearers supported by connections to posts or uprights;
- (c) "heavy duty" means intended to support both workers and stored or stacked materials, such as bricks and masonry;
- (d) "light duty" means intended to support workers, their personal hand tools and material for immediate use only;
- (e) "running scaffold" means a double-pole scaffold comprised of 2 or more bays;
- (f) "scaffold" or "scaffolding" means any temporary work platform and its supporting structure used for supporting workers or materials or both;
- (g) "single pole scaffold" means a scaffold with the outer ends of the bearers supported on ledgers secured to a single row of posts or uprights, and the inner ends of the bearers supported on or in a wall; and
- (h) "work platform" means an elevated or suspended temporary work base for workers.

Responsibilities

152. (1) Employers shall ensure that scaffolds used by their workers are in safe condition, regardless of who erected the scaffolds.

(2) A scaffold shall be erected, altered and dismantled by, or under the direct supervision of, qualified workers.

(3) A scaffold shall be inspected daily before use and after any modification.

(4) A damaged scaffold component shall not be used until it has been effectively repaired.

Standards

153. Unless otherwise permitted by this Part, a scaffold shall be designed, erected and maintained in accordance with the requirements of

- (a) CSA Standard CAN/CSA S269.2-M87 "Access Scaffolding for Construction Purposes";

- (b) ANSI Standard A10.8 -1988 "American National Standard for Construction and Demolition Operations - Scaffolding - Safety Requirements";
- (c) ANSI Standard A14.7- 1991 "Safety Requirements for Mobile Ladder Stands and Mobile Ladder Stand Platforms";
- (d) CSA Standard CAN3-Z271-M84 "Safety Code for Suspended Powered Platforms";
- (e) another standard acceptable to the minister; or
- (f) the written requirements of a professional engineer.

Scaffold stability

154. (1) A scaffold shall be erected with vertical members plumb and ledgers and bearers level.

(2) The lower end of the vertical support of a scaffold shall be supported by firm and adequately sized foundations or sills.

(3) The poles, legs and uprights of a scaffold shall be securely and rigidly braced to prevent swaying and displacement.

(4) A scaffold shall be effectively guyed or secured to a building or structure if the height of the scaffold exceeds 3 times its minimum base.

(5) Where building ties or guys are used

(a) the first level of ties or guys shall be placed at a height not exceeding 3 times the scaffold minimum base dimension, and additional building ties or guys placed at vertical intervals not exceeding 6 metres; and

(b) the ties or guys shall be placed at horizontal intervals of every third bay or 6.4 metres, whichever is the lesser, and at the end of the scaffold.

(6) A building tie shall be capable of resisting a working load of 4 kilonewtons, applied horizontally and perpendicular to the structure, or a proportionately equivalent load where ties are spaced closer together or guying is employed.

(7) Where a scaffold is enclosed by a tarp or other cover for protection against climatic conditions, bracing for the scaffold shall be installed in accordance with the instructions of a professional engineer to meet design criteria for wind or other weather induced loads.

Guardrails and
toeboards

155. (1) Except as otherwise provided by subsections (2) and (3), a work platform 1.22 metres or more above grade or floor level shall have guardrails on all open sides and ends which comply with the requirements of sections 28 and 29.

(2) A work platform 1.22 metres or more above grade or floor level on a system or fabricated scaffold shall have guardrails meeting the requirements of CSA Standard CAN/CSA-S269.2-M87 "Access Scaffolding for Construction Purposes" or another standard acceptable to the minister.

(3) Where an edge of the work platform is adjacent to a structure that provides protection equivalent to guardrails, guardrails may be omitted on that edge and there may be an open space of up to 30 centimetres between the work platform and the structure.

(4) Toeboards shall be provided and comply with all the requirements for toeboards set out in these regulations.

Grounding

156. A metal scaffold located in proximity to a high voltage energized electrical conductor or equipment shall be effectively grounded where a hazardous level of electrical charge is likely to be induced in the scaffold.

Lumber planks

157. (1) Scaffold planks shall

- (a) be rough sawn and of not less than 5.08 centimetres by 24.50 centimetre dimensions;
- (b) extend not less than 15.24 centimetres and not more than 30.48 centimetres beyond the supporting members;
- (c) be supported at intervals not exceeding 3.05 metres for light work and 2.13 metres for heavy work, including bricklaying and masonry;
- (d) be of uniform thickness in adjoining planks; and

- (e) have maximum allowable deflection not exceeding the span length divided by 80.

(2) Each lumber scaffold plank shall be visually inspected for defects before each installation and must be removed from service if found to be defective.

Manufactured
planks

158. (1) A manufactured scaffold plank shall meet the requirements of section 157 and must be used in accordance with the manufacturer's instructions and limitations, except as provided in subsection (2).

(2) A single manufactured extension staging painter's plank may be used for the support of one worker only.

Securing planks

159. Each lumber and manufactured scaffold plank installed for use shall be secured against dislodgement.

Access to scaffolds

160. (1) Access to otherwise inaccessible working levels of a scaffold up to 9 metres above a floor or grade shall be provided by

- (a) end frames providing a ladder-like structure having horizontal members uniformly spaced at approximately 30 centimetres on centre; or
- (b) a vertical or portable ladder or stairway, attached to the scaffold.

(2) Access to otherwise inaccessible working levels of a scaffold over 9 metres above a floor or grade shall be provided by

- (a) a stairway erected for the full height of the scaffold;
- (b) a temporary passenger hoist approved for use under the *Public Safety Act*;
- (c) an attached vertical ladder, with rest platforms at least every 9 metres which are fully guarded except at the ladder location; or
- (d) end frames with a ladder-like structure having horizontal members uniformly spaced at 30 centimetres on centre, and rest platforms at least every 9 metres which are fully guarded except at the ladder location.

(3) A worker shall not climb the outside of scaffold frames between landings.

Vertical ladders

161. (1) A vertical ladder providing access to working levels of a scaffold shall

- (a) be adequately fastened to the scaffold;
- (b) be configured so that its siderails extend approximately one metre above the uppermost working level;
- (c) have rungs spaced at 30 centimetres on centre; and
- (d) have a clear space of at least 15 centimetres behind each rung.

(2) A ladder attached to a scaffold shall be positioned so that its use will not cause the scaffold to become unstable.

Erection and dismantling.

162. The requirements of sections 136 to 41 apply to the erection and dismantling of a scaffold.

Spacing of components

163. The horizontal spacing between uprights, guardrail posts and bearers in a wood scaffold shall not exceed

- (a) 3 metres for a light duty scaffold; and
- (b) 2 metres for a heavy duty scaffold.

Bracing of uprights

164. Adjacent uprights shall be connected with horizontal runners (ledgers and bearers) to ensure that the unbraced vertical length of an upright does not exceed 2.4 metres.

Cross bracing

165. A scaffold shall be adequately supported in 2 directions by a system of diagonal cross braces secured to the uprights as close to the ledgers as possible.

Wood scaffolds

166. (1) Components of a light duty single-pole wood scaffold shall have minimum nominal dimensions conforming to the following table:

Component	Dimensions
Uprights up to 6.10 metres	5.08 by 10.6 centimetres

Uprights 6.10 to 15.24 metres	10.16 by 10.16 centimetres
Bearers- 91.44 centimetres span	2.54 by 15.24 centimetres
Bearers 152.40 centimetre span	5.08 by 15.24 centimetres
Ledgers	2.54 by 15.24 centimetres
Braces	2.54 by 15.24 centimetres
Wall-scabs and bearer blocks	5.08 by 15.24 centimetres
Minimum platform width	2-5.08 by 25.4 centimetres
Top guardrails	5.08 by 10.16 centimetres
Intermediate guardrails	2.54 by 15.24 centimetres
Toe-boards	2.54 by 10.16 centimetres

(2) Components of double-pole scaffolds shall have minimum nominal dimensions conforming to the following table:

Components	Dimensions	
	Light duty	Heavy duty
Uprights to 6.10 metres	5.08 by 10.16 centimetres	6.08 by 15.24 centimetres
Uprights 6.10 metres to 15.24 metres	10.16 by 10.16 centimetres	10.16 by 15.24 centimetres
Bearers- 152.4 centimetres span	2-2.54 by 15.24 centimetres or 1-5.08 by 15.24 centimetres	2-5.08 by 15.24 centimetres or 1-5.08 by 25.4 centimetres
Ledgers	2.54 centimetres by 15.24 centimetres	2.54 by 15.24 centimetres
Braces	2.54 centimetres by 15.24 centimetres	2.54 centimetres by 15.24 centimetres
Minimum platform width	2-5.08 by 25.4 centimetres	4-5.08 by 25.4 centimetres
Top guardrails	5.08 by 10.16 centimetres	5.08 by 10.16 centimetres
Intermediate guardrails	2.54 by 15.24 centimetres	2.54 by 15.24 centimetres
Toeboards	2.54 by 10.16 centimetres	2.54 by 10.16 centimetres
Note: Spacing of building ties	Vertical: 4.57 metres	Horizontal: 6.10 metres

Extension of up-rights

167. (1) A wood upright may only be extended using a butt joint, strengthened by two wooden splice plates not less than 1.2 metres long.

(2) The splice plates for wood uprights shall have a minimum thickness of 38 millimetres and be of the same width as the spliced members.

(3) The combined cross-sectional area of the splice plates shall be at least that of the vertical upright member.

Laminated uprights

168. When wood uprights are fabricated by the lamination of two or more pieces of material to obtain the required cross-sectional dimensions, the distance between joints shall be at least 1.2 metres.

Bearer supports

169. (1) The inner ends of bearers on single-pole scaffolds shall be supported by bearer blocks and securely fastened to wall scabs.

(2) Manufactured bearer supports shall be

(a) of a design acceptable to the minister; and

(b) secured to solid wall materials.

(3) Bearer hooks which engage holes in the wall sheathing shall be adequately supported by stiffeners secured to wood studs or blocking.

Definitions

170. For the purposes of this section and sections 171 to 194,

(a) "end frame scaffold" means a system of fabricated tubular metal frames (panels) that are connected in the field with bracing members;

(b) "system scaffold" means a scaffold consisting of posts with fixed connection points which accept runners, bearers and diagonal braces that can be interconnected at predetermined levels;

(c) "tower scaffold" means a double-pole scaffold comprised of only one bay;

(d) "tube and coupler scaffold" means an assembly of tubing members (posts, bearers, runners, diagonal braces, ties), a base supporting the posts and special couplers to connect the uprights and to join the various members; and

- (e) "tubular metal scaffold" means a scaffold with members made primarily of steel or aluminium tubing.

Manufacturers
specifications

171. Except as provided in section 172, a tubular metal scaffold shall

- (a) be erected in accordance with the manufacturer's instructions and specifications, including bracing in both vertical and horizontal planes;
- (b) have all components installed and connected using the fasteners specified by the manufacturer, or fasteners of equivalent quality; and
- (c) be maintained in a condition which meets the manufacturer's specifications.

Compatibility

172. Where a scaffold is erected using components made by different manufacturers, the employer shall ensure that the components are compatible.

Engineering re-
quirements

173. A scaffold shall be erected and used in accordance with the written instructions of a professional engineer where the scaffold

- (a) exceeds 38 metres in height;
- (b) exceeds 25 metres in height if stairways are included as part of the scaffold;
- (c) is used to support a temporary floor;
- (d) is subject to loads which can cause overturning; or
- (e) is suspended from a structure.

Adjustable height
bases

174. (1) A scaffold shall be erected plumb using adjustable height bases under the uprights to accommodate foundation settlement and uneven, sloping or stepped surfaces.

(2) Unless otherwise specified by the manufacturer, a height adjustment device shall not extend more than the lesser of two-thirds of its total length or 60 centimetres.

175. Spacing between frames or uprights shall not exceed the maximum allowable span for work platform components and for the intended loading.

176. (1) Vertical frames and uprights shall be joined using coupling or stacking pins to ensure proper vertical alignment.

(2) Where uplift could occur and cause components to separate, height adjusting screws, castors, coupling pins, frames and uprights shall be secured to prevent separation of components.

177. The height of any free-standing tower or rolling scaffold shall not exceed 3 times its minimum base dimension.

178. (1) Where outriggers are used to increase the minimum base dimension of a tower or rolling scaffold, such outriggers shall be installed on both sides of the scaffold structure.

(2) Notwithstanding subsection (1), where outriggers are used to increase the minimum base dimension of a tower or rolling scaffold erected adjacent to a building or other structure, the scaffold shall be braced against the structure, and outriggers used on the opposite side.

179. (1) The wheels on at least one end of a rolling scaffold shall be the swivel type.

(2) The wheels of a rolling scaffold shall not be less than 13 centimetres in diameter and shall be secured in the scaffold leg to prevent the wheel from falling out while the scaffold is being erected, used or dismantled.

(3) Height adjusting screws for castors of a rolling scaffold shall extend not more than two-thirds of their total length or 30 centimetres whichever is the lesser.

(4) A wheel of a rolling scaffold shall be equipped with effective brakes or locking devices which shall be applied when workers are working on the scaffold

(a) at a height greater than one and a half times the minimum base dimension of the scaffold; or

- (b) under conditions that could cause inadvertent movement of the scaffold.

(5) A rolling scaffold mounted on pneumatic tires shall have supports in addition to pneumatic tires while the scaffold is being erected or dismantled or when a worker is on it.

Securing decking

180. Scaffold planks or decking used as a work platform on a tower or rolling scaffold shall be fitted with means to retain planks on the bearers.

Moving restrictions

181. A worker is not permitted on a rolling scaffold while it is being moved.

Surface conditions

182. To ensure the stability of a rolling scaffold, the floor or surface over which it is moved shall be sufficiently firm, within 3° of level, and free from pits, holes, depressions and obstructions.

Components of tube and coupler scaffold

183. (1) Where 48 millimetre outside diameter aluminium or steel tube components are used in a tube and coupler scaffold

- (a) the spacing of uprights shall not exceed 3 metres;
- (b) uprights shall be connected with runners and ledgers at a vertical spacing not to exceed 2 metres; and
- (c) ledgers constructed from 48 millimetres outside diameter aluminium or steel tubing shall be limited to 1.2 metre bearing length.

(2) A tube and coupler scaffold system which does not comply with the requirements of subsection (1) shall be constructed in accordance with the design of a professional engineer.

Cross bracing

184. (1) A running scaffold shall have internal horizontal cross-bracing installed in the bay immediately adjacent to and at the level of a building tie unless equivalent bracing is achieved by use of fabricated scaffold planks secured by end hooks to provide a fully decked work platform at this level.

(2) A double-pole tube and coupler scaffold shall have internal bracing in accordance with subsection (1).

Work platforms supported by a crane or hoist	185. A work platform suspended from a crane or hoist, or attached to a crane boom shall be approved and certified by a professional engineer.
Crane capacity	186. The weight of a work platform suspended from a crane or hoist or attached to a crane boom, and its rigging, plus the rated capacity, shall not exceed 25% of the crane's rated capacity at the working radius.
Eccentric loading	187. Where a work platform attached to a crane boom causes eccentric loading on the boom, the rated capacity of the crane shall be reduced and shall be determined and certified by the crane manufacturer or a professional engineer.
Rigging	188. Rigging used to suspend a work platform from a crane or hoist shall have a safety factor of at least 10, and shall be used exclusively for suspending the work platform.
Two block prevention	189. Where a crane or hoist is being used to hoist personnel with a load line, the line shall have a device to prevent two-blocking.
Powered booms and winches	<p>190. (1) A crane used to suspend a work platform shall have a powered boom or a fixed boom.</p> <p>(2) A hoist used to raise or lower a work platform suspended from a crane shall be capable of lowering under power.</p> <p>(3) A free running boom or hoisting winch, controlled only by brakes, shall not be used to raise or lower a work platform.</p> <p>(4) Hoisting and lowering speed of a crane or hoist shall be kept as slow as practicable while supporting a work platform.</p>
Fall protection	<p>191. (1) An occupant of a work platform suspended from a crane or hoist shall use a personal fall arrest system with a shock absorbing lanyard secured to a designated anchorage point on the platform or above the load hook.</p> <p>(2) Where a work platform suspended by a crane or hoist is occupied by a worker with a personal fall arrest system attached to the platform, the platform shall have a safety strap that will prevent the platform from falling more than 15 centimetres if the platform becomes dislodged from the hook.</p>

(3) Each occupant of a work platform attached to a crane boom shall use a personal fall arrest system secured to a designated anchorage point on the boom.

Articulating booms
prohibited

192. A work platform shall not be

- (a) suspended from an articulating boom crane; or
- (b) attached to an articulating boom crane unless such installation is approved by the crane manufacturer.

Travelling restriction

193. Travelling with a worker in a work platform supported by a crane or hoist is not permitted except when the platform is supported by a rail-mounted crane.

Communications

194. The operator of a crane or hoist used to suspend a work platform shall have an effective means of constant communication with any person on the platform.

Definitions -
elevating work
platforms

195. For purposes of this section and sections 196 to 211,

- (a) "aerial device" means a vehicle-mounted device having a boom which may be telescoping or articulating, or both, with a work platform on the boom, which is used to position personnel;
- (b) "aerial ladder" means a vehicle-mounted aerial device with a single or multiple-section ladder with or without a platform at the top;
- (c) "boom-supported elevating work platform" means an elevating work platform or aerial device which has its platform supported by an elevating device that elevates and rotates relative to the machine base;
- (d) "elevating work platform" means a work platform or aerial device which self-elevates to overhead work locations and includes other similar devices not covered elsewhere in these regulations; and
- (e) "self-propelled" means the capability of an elevating work platform to be power propelled with the primary controls on the work platform.

Standards

196. (1) A self-propelled work platform comprising a boom-supported elevating platform, which telescopes, articulates, rotates or extends beyond the base dimensions, and is not mounted on a separate self-propelled vehicle shall meet the requirements of

- (a) CSA Standard CAN3-B354.4-M82 "Boom-Type Elevating Work Platforms";
- (b) ANSI Standard ANSI/SIA A92.5-1992 "Boom-Supported Elevating Work Platforms"; or
- (c) other standard acceptable to the minister.

(2) A self-propelled integral chassis elevating work platform having a platform that cannot be positioned laterally completely beyond the base and for which primary functions are controlled from the platform shall meet the requirements of

- (a) CSA Standard CAN3-B354.2M82 "Self-Propelled Elevating Work Platforms for Use on Paved/Slab Surfaces";
- (b) CSA Standard CAN3-B354.3-M82 "Self-Propelled Elevating Work Platforms for Use as 'Off-Slab' Units";
- (c) ANSI Standard ANSI/SIA A92.6-1990 "American National Standard for Self-Propelled Elevating Work Platforms"; or
- (d) other standard acceptable to the minister.

(3) A manually propelled, integral chassis elevating work platform having a platform that cannot be positioned laterally completely beyond the base, which may be adjusted by manual or powered means and which shall not be occupied when moved horizontally, shall meet the requirements of

- (a) CSA Standard CAN3-B354.1-M82 "Elevating Rolling Work Platforms";
- (b) ANSI Standard ANSI/SIA A92.3-1990 "American National Standard for Manually Propelled Elevating Aerial Platforms"; or
- (c) other standard acceptable to the minister.

(4) A telescopic aerial device, aerial ladder, articulating aerial device, vertical tower, material-lifting aerial device or any combination of these, when vehicle-mounted, whether powered or manually operated, shall meet the requirements of CSA Standard CAN/CSA-C225-M88 "Vehicle-Mounted Aerial Devices" or other standard acceptable to the minister.

(5) An elevating work platform of a type other than that referred to in subsections (1) to (4) shall meet a standard acceptable to the minister.

Operating and
maintenance manu-
als

197. (1) The equipment manufacturer's

(a) operation manual; and

(b) maintenance manual, containing maintenance instructions and replacement part information

for each elevating work platform in use at the workplace shall be available at the workplace.

(2) If either of the manuals referred to in subsection (1) is not available, the equipment shall not be used until the manual is obtained, or until written instructions for the safe operation and maintenance of the equipment are supplied by a professional engineer.

Inspection and
maintenance re-
cords

198. (1) Records of inspection, maintenance, repair and modification shall be kept for an elevating work platform by the equipment operator and a person inspecting and maintaining the equipment.

(2) Where the inspection and maintenance records required under subsection (1) are not available, an elevating work platform shall be inspected and certified by a professional engineer before use, and an inspection and maintenance recording system shall be established as required by subsection (1).

Shift inspection

199. An elevating work platform shall be inspected by the operator before use on each shift and a condition that could endanger workers shall be remedied before the platform may be used.

Annual inspection
and certification

200. (1) An elevating work platform shall be inspected, maintained, repaired and modified in accordance with

- (a) the manufacturer's instructions;
- (b) the relevant CSA Standard as specified in section 196;
- (c) generally accepted standards of good engineering practice;
or
- (d) another standard acceptable to the minister.

(2) An insulated aerial device shall be dielectrically tested at least annually in accordance with CSA Standard CAN/CSA-C225-M88 "Vehicle Mounted Aerial Devices" or other standard acceptable to the minister and the insulating capability of such aerial device shall be certified by the testing agency.

Fall protection

201. (1) A person on an elevating work platform shall wear a personal fall arrest system secured to an anchorage point that is approved by the manufacturer or professional engineer.

(2) A worker on an aerial ladder shall be continuously protected by means of a personal fall arrest system as required by Part X or shall maintain 3 points of contact with the ladder at all times.

Safe access

202. Safe means shall be provided to get on and off the platform of an elevating work platform.

Rated capacity

203. The rated capacity of an elevating work platform shall be marked on the platform and shall not be exceeded.

Outriggers

204. (1) An outrigger on an elevating work platform shall be used in accordance with the manufacturer's instructions.

(2) Where an elevating work platform has outriggers, notices indicating the circumstances specified by the manufacturer for which the outriggers are to be used shall be clearly displayed at the operating controls for the platform.

Controls

205. (1) Each control on an elevating work platform shall be clearly identified to indicate its function.

(2) Controls on an elevating work platform shall be 'hold-to-run' (continuous pressure) type that return to the neutral or stop position when released.

(3) Controls on an elevating work platform shall be protected against inadvertent operation.

(4) Each set of operating controls of an elevating work platform shall be provided with an emergency stop device.

(5) An emergency stop device referred to in subsection (4)

(a) within easy reach of the operator;

(b) clearly labelled 'STOP'; and

(c) red in colour.

(6) An elevating work platform shall have a clearly marked overriding lowering control to enable a worker at the lower controls to stop and lower the platform in the event of an emergency.

Immobilization of
vehicles

206. (1) The carrier vehicle of an elevating work platform shall be secured against inadvertent movement before a worker occupies the platform.

(2) Where a manufacturer permits an elevating work platform to be elevated on sloping ground, the vehicle's wheels shall be secured according to the manufacturer's instructions and where no such instructions have been provided, the wheels shall be chocked.

Shear hazard

207. An elevating work platform lifting mechanism which creates a shear hazard to workers shall be adequately guarded or identified with signs, decals or similar markings warning of the hazard.

Warning devices

208. An elevating work platform, other than a vehicle-mounted aerial device which complies with the requirements of CSA Standard CAN/CSA-C225-M88 "Vehicle Mounted Aerial Device", shall have a warning system consisting of an intermittent horn or flashing light which is automatically activated during any motion of the work platform.

Transporting workers

209. A worker may not be transported on an elevated work platform unless such transport is in accordance with the manufacturer's instructions.

Platform specifications

210. A work platform mounted on the forks of a lift truck shall be designed by an engineer or conform to a standard acceptable to the minister and

- (a) securely attached to the lifting carriage or forks;
- (b) provided with perimeter guardrails meeting the requirements of sections 28 and 29;
- (c) equipped with guarding to prevent occupants from contacting any hazardous parts of the lifting machinery; and
- (d) clearly marked with the rated load of the platform.

Operating procedures

211. Where a worker is elevated on a work platform supported by a lift truck,

- (a) the lift truck operator shall remain at the controls of the lift truck;
- (b) the lift truck mast shall be kept vertical;
- (c) the lift truck shall not be moved except for minor adjustments necessary to facilitate positioning of the platform; and
- (d) a platform occupant shall use a personal fall protection system as required by Part X.

Swing stages - definitions

212. For purposes of this section and sections 213 to 236

- (a) "bridging" means using a deck or planking to span a gap between two independent work platforms;
- (b) "rated load" means the maximum load as designated by the manufacturer which may be placed safely on a swing stage, and includes the weight of the workers, their tools and equipment, material to be transported and allowances for loads such as trailing electric power supply cords, compressed air supply lines, abrasive blasting feed supply lines, or any other loads, but does not include the weight of the work platform or its supporting rigging;

- (c) "safe lower landing" means an area onto which a swing stage or other suspended platform system can be lowered that is capable of safely supporting the weight of the swing stage plus the rated load of the system and which can be accessed safely by workers;
- (d) "static load" means
- (i) for suspension by 2 or more lines, the rated load of the swing stage plus half the weight of the stage including the working platform, hangers or stirrups, hoisting units and suspension lines, and
 - (ii) for suspension by a single line, the rated load plus the weight of the stage;
- (e) "suspension height" means the distance from the upper attachment points of the suspension line to the safe lower landing for the swing stage; and
- (f) "swing stage" means a temporary suspended work platform used to support workers, tools, equipment and materials, which is raised and lowered by manually powered hoisting equipment.

Rated load

213. The rated load

- (a) shall be permanently marked upon a swing stage and clearly readable by workers on the stage; and
- (b) shall not be exceeded.

Weight identification

214. A swing stage platform and a hoist unit shall have its weight clearly marked on it.

Prior permission

215. A swing stage shall not be used without the prior permission of the minister when

- (a) there will be 2 or more work platforms at different levels on one swing stage assembly;
- (b) one swing stage will be used above or below any portion of another swing stage;

- (c) there will be bridging between swing stages;
- (d) a work platform exceeds 10 metres in length; or
- (e) the suspension height exceeds 90 metres.

Attachment points

216. A swing stage shall be suspended from parapet clamps, cornice hooks, thrust-out beams or other solid anchorages having a working load limit that is at a minimum equivalent to that of the suspension system for the swing stage.

Securing suspension lines

217. A suspension line for a swing stage shall be secured at the upper end using a safety hook, shackle or other method acceptable to the minister.

Hook and clamp working load limit

218. The working load limit of a cornice hook or parapet clamp shall be determined by the manufacturer or professional engineer and shall be clearly marked on the hook or clamp.

Hook and clamp engagement

219. (1) A cornice hook or parapet clamp shall be installed to engage structurally sound portions of a building or structure having adequate strength for the purpose.

(2) Where the structural adequacy of the building or structure at the point of attachment of a cornice hook or parapet clamp is not known, a professional engineer shall determine and certify the attachment points.

Tiebacks

220. (1) A cornice hook, parapet clamp or thrust-out beam shall be secured by a tieback to a solid anchorage on the building or structure or to another parapet clamp secured on the far side of the structure.

(2) The securing, rigging and anchorage required under subsection (1) shall have an ultimate strength of at least 22 kilonewtons.

(3) A tieback referred to in subsection (1) shall, to the extent practicable, be rigged at a right angle to the building face.

Thrust-out beams

221. (1) A thrust-out beam used to support a swing stage shall provide a minimum safety factor of 4, based on the ratio of the ultimate load carrying capacity of the thrust-out beam to the static load.

(2) The rated load for the allowable thrust-out beam projections shall be determined by the beam manufacturer or a professional engineer and clearly marked on the beam.

Counterbalance of
thrust-out beams

222. (1) A thrust-out beam used for supporting a swing stage shall be counterbalanced to support a load of at least 4 times the static load.

(2) A counterweight used to counterbalance a thrust-out beam shall be

- (a) clearly marked to indicate its weight;
- (b) of solid material not subject to loss of weight through attrition; and
- (c) secured to the thrust-out beam.

Hook closures

223. (1) A hook used in a swing stage suspension system shall be moused or have a safety latch.

(2) Subsection (1) does not apply to the connection between a cornice hook and the structure.

Protection against
damage

224. (1) Where a suspension line, tieback, lifeline or other part of the rigging for a swing stage comes into contact with a rough or sharp edge, the line shall be protected from damage.

(2) Padding shall be used to minimize loss of rope strength where a line supporting a swing stage makes a sharp bend over an edge.

Fibre rope suspen-
sion

225. Fibre rope used to suspend a swing stage or similar equipment shall

- (a) provide a safety factor of at least 10, based on the ratio of the rope manufacturer's rated breaking strength for the rope to the load on the rope due to the static load;
- (b) be made of synthetic fibre having a breaking strength of at least 22 kilonewtons;
- (c) be reeved through a block and tackle system comprising at least one double upper and one single lower block, for each hanger;

- (d) have the hauling line secured to prevent free running of the line;
- (e) be free of knots or splices except for terminal eye-splices; and
- (f) not be used where exposed to adverse effects of chemicals, unless the rope is made of materials inert to the chemicals.

Wire rope suspension

226. Wire rope used to suspend a swing stage or similar equipment shall

- (a) provide a safety factor of at least 10, based on the ratio of the manufacturer's rated breaking strength of the wire rope on the load on the rope due to the static load;
- (b) be a type recommended for that use by the rope manufacturer, and recommended for use by the hoist manufacturer; and
- (c) be continuous and unspliced, except for terminal eye-splices or other types of terminal connections required under Part XV, but fold back eyes secured by only a pressed metal sleeve shall only be used where the sleeve manufacturer approves the use of the sleeve for this application, and the eyes are made in accordance with the manufacturer's instruction and proof tested.

Length of suspension ropes

227. (1) Suspension ropes for a swing stage shall be of sufficient length to permit the work platform to be lowered to a safe lower landing.

(2) Where a swing stage or platform is suspended over water, or where it is impractical to lower the work platform to a safe lower landing, lower limit travel devices, compatible for safe use with the hoist system, shall be used to ensure the working platform shall not be lowered beyond the safe lower limit of travel.

Hoisting devices

228. Winches and other mechanical devices used for hoisting and lowering swing stages or similar equipment shall have automatically operated locking mechanisms that prevent slipping of the suspension ropes.

Hangers or stirrups	<p>229. (1) A hanger or stirrup used for supporting a swing stage shall</p> <ul style="list-style-type: none"> (a) be made of mild steel or other metal having similar properties, but shall not be made of wire rope; (b) have a minimum safety factor of 10 based on the ratio of the ultimate load carrying capacity of the stirrup or hanger to the static load; and (c) be effectively fastened to the swing stage platform to prevent inadvertent separation.
Platform width	<p>230. A swing stage work platform shall be at least 50 centimetres wide.</p>
Safety factor	<p>231. A swing stage work platform shall have a safety factor of at least 4, based on the ratio of the ultimate load carrying capacity of the work platform to the rated load.</p>
Rated load	<p>232. The rated load for a swing stage platform shall be established by the platform manufacturer or a professional engineer.</p>
Guardrails	<p>233. (1) A swing stage shall have guardrails with</p> <ul style="list-style-type: none"> (a) a top rail of 1.07 metres high on all sides of the platform and an intermediate rail, located midway between the top rail and the platform floor, or top of the toeboard, as applicable; or (b) other type of guarding providing equivalent protection and satisfactory to the minister. <p>(2) Guardrails on a swing stage shall be adequately supported and shall be able to withstand an ultimate load of 450N concentrated at any point on the top rail.</p>
Toeboards and netting	<p>234. A swing stage on which loose material or equipment is carried shall have toeboards at least 10 centimetres high along all sides of the work platform, and netting with a mesh opening of less than 2.5 centimetres extending from the toeboard to the top rail on the backside.</p>

235. (1) A swing stage and associated equipment shall be thoroughly inspected before use on each shift and defective equipment shall not be used.

(2) A swing stage that has been subjected to a sudden drop, contact with exposed energized electrical equipment or conductors, or shows signs of a structural failure of any sort shall be removed from service until certified safe for use by the manufacturer or a professional engineer.

Fall protection

236. A worker on a swing stage which is 3 meters or more above grade or a safe lower landing, or where a fall from a lesser height may involve an unusual risk of injury, shall use a personal fall arrest system meeting the requirements of Part X secured to an anchor independent of the swing stage system.

Boatswain's chairs

237. (1) A boatswain's chair shall meet the requirements of the applicable CSA standard or be acceptable to a professional engineer.

(2) A boatswain's chair shall provide stable and adequate support for the user.

(3) A boatswain's chair shall be suspended from a parapet clamp, cornice hook, thrust-out beam or other solid anchorage having a working load limit at least equivalent to that of the suspension system for the boatswain's chair.

(4) A counter weight shall be

(a) positively secured to thrust outs; and

(b) tied back to an anchorage that is capable of withstanding 22 kilonewtons static load where a counter weight configuration has not been designed into the building.

(5) Where a boatswain's chair is supported by block and tackle

(a) the rope shall be synthetic fibre rope with a breaking strength of at least 22 kilonewtons;

(b) the rope shall be reeved through not less than one single lower block and one double upper block and shall be secured to prevent the line from free running; and

(c) block hooks shall be moused, or otherwise secured against dislodgement.

(6) Fibre rope used to suspend a boatswain's chair other than with a block and tackle system shall be synthetic fibre rope having a breaking strength of at least 27 kilonewtons and of a type compatible for use with the rigging hardware in the suspension system.

(7) Wire rope used to suspend a boatswain's chair shall be a type recommended for that use by the rope manufacturer or a professional engineer and suitable for the hoist being used.

(8) A worker in a boatswain's chair which is 3 metres or more above grade or a safe lower landing, or where a fall from a lesser height may involve an unusual risk of injury, shall use a personal fall arrest system meeting the requirements of Part X independent of the boatswain's chair system.

(9) A boatswain's chair shall not be used if the suspension height exceeds 92 metres without the prior permission of the minister.

(10) A thorough inspection shall be made of a boatswain's chair and associated equipment before use each day and defective equipment shall not be used.

Definitions

238. For purposes of sections 239 to 244

- (a) "permanent powered platform" means a powered platform which is a permanent installation on a particular building or structure;
- (b) "portable powered platform" means a powered platform any part of which is not permanently installed or attached to a particular building or structure and which may be removed and relocated elsewhere as required; and
- (c) "powered platform" means a suspended swing stage which is raised or lowered by other than manual means.

Permanent powered platforms

239. A permanent powered platform shall meet the requirements of CSA Standard CAN3-Z271 "Safety Code for Suspended Powered Platforms" or other standard acceptable to the minister and shall be of a design and construction certified by a professional engineer.

Portable powered
platforms**240.** (1) A portable powered platform shall meet

- (a) the requirements for a swing stage regarding suspension, construction and use of fall protection; and
- (b) the requirements of CSA Standard CAN3-Z271-M84 "Safety Code for Suspended Powered Platforms" for hoist units and controls.

(2) Where a portable powered platform is raised and lowered by 2 separately controlled hoists operated by a single occupant on the platform, the controls shall be located so that they can be used simultaneously by the occupant.

Prior permission

241. A portable powered platform may not be used without the prior permission of the minister where

- (a) there are 2 or more work platforms at different levels on one powered platform assembly;
- (b) one powered platform will be used above or below any portion of another powered platform;
- (c) there is bridging between powered platforms;
- (d) the work platform exceeds 10 metres in length; or
- (e) the suspension height exceeds 91 metres.

Fall protection

242. (1) Except as permitted by subsection (2), where a powered platform is 3 metres or more above a grade or a safe lower landing or where a fall from a lesser height may involve an unusual risk of injury, a worker on the platform shall use a personal fall arrest system meeting the requirements of Part X secured to an anchor independent of the powered platform system.

(2) A worker supported on a permanent powered platform having 4 or more suspension ropes shall be attached to a secure anchorage on the platform by means of a personal fall arrest system and the installation shall meet the requirements of CSA Standard CAN3-Z271-M84 "Safety Code for Suspended Powered Platforms" or other standard acceptable to the minister.

243. Records of inspection and maintenance shall be maintained by the operator and any other person inspecting and maintaining a permanent powered platform.

Maintenance and
operating records

Window cleaning

244. A window cleaning operation shall be conducted in accordance with the requirements of CSA Standard/CSA-Z91-M90 "Safety Code for Window Cleaning Operations" or other standard that the minister may consider appropriate.

Window cleaning
fall protection

245. (1) Where a window is being cleaned by a worker at an elevation from which a fall of 3 meters or more may occur, or a fall from a lesser height may involve an unusual risk of injury, a fall protection system meeting the requirements of Part X shall be used.

(2) Where window cleaning is carried out by a worker who is standing on a window sill a permanent anchor used for a window cleaner's safety strap shall meet the requirements of CSA Standard CAN/CSA-Z91-M90 "Safety Code for Window Cleaning Operations" or other standard acceptable to the minister; and

PART XII POWERED MOBILE EQUIPMENT

Definitions

246. In this part

- (a) "mobile equipment" means a wheeled or tracked vehicle which is engine or motor powered, together with attached or towed equipment, but does not include a vehicle operated on fixed rails or tracks;
- (b) "no significant hazard of rollover" means an area in which there are no grades exceeding 10%, no operating areas with open edges, and no open ramps, loading docks, ditches or other similar hazards which might cause a rollover; and
- (c) "specific location" means a yard, plant or other clearly defined and limited area in which mobile equipment is operated, but does not include a entire municipality, district, transient forestry operation or construction site.

Application

247. This part applies to mobile equipment used by or around workers.

Operation and
maintenance

248. (1) Mobile equipment shall be maintained in safe operating condition and operation, inspection, repair, maintenance and modification shall be carried out in accordance with the manufacturer's instructions or, in the absence of instructions, as approved by a registered professional engineer.

(2) Servicing, maintenance and repair of mobile equipment shall be done

(a) when the equipment is not in operation; or

(b) when the equipment is in operation if continued operation is essential to the process and a safe means is provided.

(3) The design, fabrication, use, inspection and maintenance of mobile equipment shall meet the requirements of the following applicable standard or other standards acceptable to the minister:

Equipment

Mobile and Locomotive Cranes

Applicable Standard

CSA Standard Z150-1974, "Safety Code for Mobile Cranes" or ANSI Standard ASME B30.5-1994, "Mobile and Locomotive Cranes"

Powered Industrial Trucks (low lift and high lift)

ANSI Standard ASME B56.1-1993, "Safety Standard for Low Lift and High Lift Trucks

Vehicles with Mounted Aerial Devices (except fire-fighting equipment)

CSA Standard CAN/CSA-C225-M88 "Vehicle with Mounted Aerial Devices"

Vehicles with Mounted Aerial Devices (fire fighting equipment)

NFPA 1904 "Aerial Ladder and Elevating Platform Fire Apparatus", 1991 edition

Safety and Hazard Warnings

ISO Standard 9244:1995 "Earth moving machinery -- safety signs and hazard pictorials -- General principles

Lift Truck Operator training

CSA Standard B335-94 "Industrial Lift Truck Operator Training"

(4) Maintenance and inspection records shall be maintained and made reasonably available to the operator and maintenance personnel during work hours.

(5) Mobile equipment used off maintained roads shall be appropriate and safe for the intended use taking into account factors such as the nature of the travel surface and its slope and the activities to be undertaken.

Competency and
testing operators

249. (1) A person shall not operate mobile equipment unless he or she

- (a) has received adequate instruction and has demonstrated to a supervisor or instructor that he or she is a competent equipment operator;
- (b) has been authorized to operate mobile equipment;
- (c) is familiar with the operating instructions for particular equipment before he or she attempts to operate it; and
- (d) has, if required to operate an air brake equipped vehicle, evidence of successful completion of a course on air brake systems issued by an organization acceptable to the minister.

(2) Only authorized operators or those in the process of being trained as permitted by management shall be allowed to drive mobile equipment and they shall keep the equipment under control at all times.

(3) Subsection (1) does not apply where a trainee operates the equipment under the supervision of a qualified instructor or supervisor as authorized by the employer.

Operator's responsi-
bility

250. (1) The operator of mobile equipment shall operate the equipment safely, maintain full control of the equipment, and comply with the laws governing the operation of the equipment.

(2) The operator of mobile equipment shall ensure that a worker is not in close proximity to the swing radius of the equipment while it is in operation.

Supervisor's respon-
sibility

251. A supervisor shall not knowingly operate, or permit a worker to operate, mobile equipment which is, or which could create, an undue

hazard to the health or safety of a person, or which is in violation of these regulations.

Warning signal
device

252. (1) Mobile equipment shall be equipped with an audible warning signal device as follows:

- (a) where the mobile equipment is capable of a forward speed exceeding 8 kilometres per hour, it shall be equipped with a horn or similar audible warning device;
- (b) where mobile equipment operates in reverse motion, it shall be equipped with a suitable audible warning device that initiates automatically when the equipment starts to move in reverse and which continues to operate while the equipment is moving in reverse; and
- (c) where the mobile equipment is not capable of speeds greater than 8 kilometres per hour, the minister may, in exceptional circumstances, order the use of an audible warning device referred to in paragraph (a).

(2) Where an audible warning device referred to in subsection (1)

- (a) cannot be clearly heard or identified above the noise of other equipment or surrounding noise, another warning device or measure shall be utilized; or
- (b) would result in night-time noise levels above those allowed by municipal by-laws, another warning device or method shall be used at night.

Lights

253. (1) Mobile equipment used during the period from 1/2 hour after sunset to 1/2 hour before sunrise, or when a person or vehicle is not clearly discernible at a distance of 150 metres shall have and use light to adequately illuminate

- (a) the direction of travel;
- (b) the working area about the mobile equipment; and
- (c) the cab instruments.

(2) A headlight and backing light required by paragraph (1)(a) shall meet the requirements of Society of Automotive Engineers (SAE) J1029 MAR86 "Lighting and Marking of Construction and Industrial Machinery".

Rear view mirrors

254. (1) Mobile equipment shall have a mirror providing the operator with an undistorted reflected view to the rear of the mobile equipment or combination of mobile equipment, except as provided in subsection (2).

(2) Where necessary to improve rear vision, a combination of parabolic and flat mirrors may be used.

Load handling attachments

255. Buckets, forks, booms, hoists and other load handling attachments shall only be installed on mobile equipment as specified by the equipment manufacturer or when certified by a professional engineer for use on the equipment.

Load ratings

256. (1) Mobile equipment designed and used for lifting, hoisting or similar operations shall have a permanently affixed notation, legible and visible to the operator, stating the rated load of the equipment.

(2) A load chart shall be displayed in the operator's cab where the rated load varies with the reach of the equipment.

Operative protective structures

257. (1) An equipment operator shall be protected against falling, flying or intruding objects or materials by means of a suitable cab, screen, grill, deflector or guard that meets the design criteria of the Society of Automotive Engineers applicable recommended practice.

(2) A worker shall not remain in the cab of a vehicle while loads are elevated over the cab unless the cab is protected by an adequate overhead guard.

Rollover protective structures

258. (1) The following types of mobile equipment weighing 700 kilograms or more shall have rollover protective structures ("ROPS"):

- (a) crawler tractors, dozers, loaders and skidders;
- (b) wheeled tractors, dozers, loaders and skidders;
- (c) motor graders;

- (d) self-propelled wheel scrapers;
- (e) agricultural and industrial tractors;
- (f) compactors and rollers; and
- (g) self-propelled rock drills moved by an on-board operator.

(2) The minister may require a rollover protective structure to be installed on mobile equipment, other than mobile equipment referred to in subsection (1), where the design of the equipment or circumstances of use indicate the need.

Rollover protective
structure standards

259. A rollover protective structure shall meet the requirements of one of the following applicable standards or other standard acceptable to the minister:

- (a) CSA Standard B352.0-95 "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines -- Part 1: General Requirements"; and
 - (i) CSA Standard B352.1-95 "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines -- Part 2: Testing Requirements for ROPS on Agricultural Tractors", or
 - (ii) CSA Standard B352.2-95 "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines -- Part 3: Testing Requirements for ROPS on Construction, Earthmoving, Forestry, Industrial, and Mining Machine";
- (b) Society of Automotive Engineers (SAE) Standard J1040 MAY94 "Performance Criteria for Rollover Protective Structures (ROPS) for Construction, Earthmoving, Forestry, and Mining Machines"; and
- (c) ISO Standard 3471: 1994 "Earth-moving Machinery -- Rollover Protective Structures -- Laboratory Tests and Performance Requirements".

Rollover protective
structure certifica-
tion

260. (1) A rollover protective structure shall be certified by the manufacturer or a professional engineer as meeting a standard specified in section 259.

(2) An addition, modification, welding or cutting on a rollover protective structure shall be done in accordance with the instructions of, and be recertified by, the manufacturer or a professional engineer.

Rollover protective
structure identifica-
tion

261. (1) The following information shall be permanently marked upon a rollover protective structure:

- (a) the name and address of the manufacturer or the professional engineer who certified the rollover protective structure;
- (b) the model number or other effective means of identifying the machine for which the rollover protective structure was designed;
- (c) the serial number or other unique means of identifying the rollover protective structure;
- (d) the maximum weight of the machine for which the rollover protective structure was designed; and
- (e) the standard to which the rollover protective structure conforms.

(2) A modified rollover protective structure shall be permanently marked with the following information:

- (a) an identification of the modifications effected;
- (b) the date of recertification; and
- (c) the name and address of the recertifying engineer.

Effect of rollover
protective structure
on visibility

262. A rollover protective structure or other structure required by this part for the protection of the operator shall be designed and installed to provide an adequate view to allow the operator to safely use the machine.

Powered mobile
equipment

263. (1) A well designed and constructed, safely located and securely mounted seat and seat belt or other safe facilities shall be provided for the operator of powered mobile equipment and any passenger.

(2) Safe facilities for an equipment operator, referred to in subsection (1), shall include:

- (a) footboards or platforms upon which the workers stand or sit, located to protect workers from accidental contact; and
- (b) handholds; or
- (c) safety-belts, harnesses, guardrails or other effective means of restraint.

(3) Subsection (1) does not apply to mobile equipment designed to be controlled by an equipment operator in a standing position.

(4) Where mobile equipment is equipped with seat belts, in conformity with these regulations or other applicable federal or provincial legislation, the installations shall be maintained and seat belts shall be worn by the equipment operator and passengers at all times while the equipment is in motion, or when operated in a stationary mode.

(5) Where a road grader is operated with cab doors open, and the equipment operator is necessarily in a standing position and unable to comply with subsection (4), additional restraining devices as approved by the minister shall be installed and used to prevent occupants from falling from the cab.

(6) Where an equipment operator is required to operate in a standing position, there shall be protection provided equivalent to the protection required under subsection (5) in the form of a restraining harness designed to prevent the equipment operator being thrown from the cab in a roll-over situation, but the restraining harness shall have a quick release device.

Start of shift inspection

264. (1) An operator shall inspect the mobile equipment before the start of operation on the shift and thereafter as required to ensure the safe operating condition of the equipment and a defect or other condition affecting the safe operation of the equipment shall be reported immediately to the supervisor or employer.

(2) A repair or adjustment necessary for the safe operation of the equipment shall be made before the equipment is used.

Securing tools and equipment

265. An operator shall maintain the cab, floor and deck of mobile equipment free of material, tools or other objects which could create a tripping hazard, interfere with the operation of controls, or be a hazard to the operator or other occupants in the event of an accident.

Unattended equipment

266. An operator of mobile equipment shall not leave the controls unattended unless the equipment has been secured against inadvertent movement, such as by setting the parking brake, placing the transmission in the manufacturer's specified park position and by chocking wheels where necessary., and grapples or tongs shall be landed in a safe position before equipment controls are left unattended.

Securing elevated loads

267. (1) An elevated load, part, extension or machine, shall not be left unattended by an operator unless it has been immobilized and secured against inadvertent movement.

(2) Where a worker is required to work beneath an elevated part of mobile equipment, the elevated part shall be securely blocked.

(3) An hydraulic or pneumatic jack shall not be used for blocking unless it has been fitted with a device to prevent collapse in the event of loss of hydraulic or pneumatic pressure.

Swinging equipment

268. Where the swinging movement of a load, cab, counterweight or other part of mobile equipment creates a hazard, a worker shall not be within range of the swinging load or equipment, and the operator shall not move the equipment when a worker is so exposed.

Obstructed view

269. Where a mobile equipment operator's view of the work area is obstructed, the operator shall not move the equipment until precautions have been taken to protect the operator and any other worker from injury, including

- (a) immediately before the movement, the inspection by the operator on foot of the area into which the equipment will be moved;
- (b) direction by a signaller stationed in a safe position in continuous view of the operator and having an unobstructed view of the area into which the equipment will move; or

(c) direction by a traffic control or warning system.

Pedestrian and
equipment traffic

270. (1) Where practicable, designated walkways shall be used to separate pedestrian traffic from areas of operation of mobile equipment.

(2) Where it is impracticable to provide designated walkways, adequate safe work procedures to minimize the possibility of collision shall be used in hazardous work areas, including

- (a) use of a traffic control system;
- (b) enforcement of speed limits for mobile equipment;
- (c) a requirement for the pedestrian and the mobile equipment operator to acknowledge each other's presence before the pedestrian proceeds through the hazardous area; or
- (d) other effective means.

Securing loads

271. (1) When material or equipment is being transported, it shall be loaded or secured to prevent movement of the load which could create a hazard to workers.

(2) To protect the crew of a vehicle transporting a load which might shift on rapid deceleration, a means of load restraint shall be provided which

- (a) will prevent significant load shift relative to the carrier under emergency stopping conditions; and
- (b) meets a standard acceptable to the minister.

Restraint for cylind-
rical objects

272. Cylindrical objects transported on their sides shall be effectively restrained against inadvertent movement.

Lift truck loads

273. (1) A unitized load transported on a lift truck shall not project a distance greater than half its height above the fork carriage, back rest or back rest extension of the lift truck.

(2) No part of a load comprised of loose objects may project above the fork carriage, back rest or back extension of a lift truck.

(3) A load which could shift during transportation shall be restrained where shifting would result in the instability of the load or the lift truck.

Tire installation

274. (1) An employer shall

- (a) establish and implement safe work procedures for servicing mobile equipment, tires, rims and wheels, including
 - (i) inspecting tire, rim and wheel components,
 - (ii) mounting a tire to the rim and wheel, and inflating a tire,
 - (iii) installing and removing tire assemblies from mobile equipment, and
 - (iv) demounting tires from the rim and wheel assemblies; and
- (b) ensure that tire limits are not exceeded.

(2) A worker assigned to work on tires, rims and wheels shall be trained in and follow the safe work procedures established under subsection (1).

Equipment and procedures

275. (1) A tire shall be deflated before demounting, and deflation shall be done in an area where ignition sources are controlled or removed.

(2) A tire, rim and wheel part shall be cleaned and inspected for damage before mounting, and a cracked, broken, bent or otherwise damaged part shall be replaced.

(3) A tire shall be inflated using a remote chuck with a sufficient length of hose and an inline, hand operated valve with a gauge so the worker is outside the likely trajectory should wheel components separate during inflation.

(4) A tire mounted on a multipiece rim wheel shall be placed in a cage or other restraining device when it is being inflated.

(5) Where a bead expander is used to seat the beads of a tire, it shall be removed before the tire is inflated to more than 34.5 kPa (5 psi).

(6) Welding or heating on an assembled rim or wheel part is not permitted, except that limited heating to facilitate removal of a wheel from a hub is acceptable after the tire has been deflated by removing the valve core.

(7) A tire on a multipiece rim wheel shall be deflated to atmospheric pressure by removing the valve core or by other effective means before demounting, and in the case of a dual wheel arrangement, both tires shall be deflated to atmospheric pressure before a wheel nut is loosened.

(8) Multipiece rim and wheel components shall not be interchanged except as permitted by rim/wheel charts from the appropriate rim/wheel manufacturer.

(9) A multipiece rim wheel which has been used at less than 80% of the recommended inflation pressure for that application shall be deflated, disassembled and inspected before reinflation.

PART XIII TRANSPORTATION OF WORKERS

Application

276. This Part applies to all persons, including the operator, engaged in transporting a worker by any type of vehicle operated on behalf of the employer except for the transportation of a worker by

- (a) a public transportation system including a taxi, bus line, chartered air service or airline; or
- (b) personal transport of the worker on public roads prior to or following a work shift.

Seat belts

277. (1) Where reasonably practicable, a vehicle used to transport workers shall have seats with full seat backs and seat belts shall be of the 3 point variety.

(2) A seated worker shall wear a seat belt while being transported in a vehicle equipped with seat belts and the number of workers

being transported shall not exceed the number of seat belts available in the vehicle.

Riding restrictions

278. A worker shall not ride or be required or permitted to ride in a vehicle

- (a) in a standing position, unless protection is provided against being thrown off balance; or
- (b) with any part of the body protruding outside a part of the vehicle unless essential to the work process and the worker is adequately restrained.

Securing equipment

279. (1) Materials, goods, tools or equipment carried in a portion or compartment of a vehicle in which a worker is riding shall be located and secured to prevent injury.

(2) Materials, goods, tools or equipment regularly carried in a vehicle in which a worker is riding shall be transported in a designated area in the vehicle.

Hazardous materials

280. Where a volatile, flammable or otherwise hazardous material is transported in a vehicle transporting workers, it shall be carried in an isolated compartment that is

- (a) accessible only from the outside of the vehicle, securely fastened and fitted with adequate ventilation and drainage facilities; or
- (b) if internal to the vehicle, separated from the crew compartment by an approved firewall.

Passenger compartments

281. An enclosed portion or compartment of a vehicle in which a worker is transported shall be provided with

- (a) effective ventilation, independent of doors, providing clean air;
- (b) adequate lighting and means for heating and cooling;
- (c) an effective means of communication between the operator and the passengers; and

- (d) more than one means of egress.

Boarding and
leaving

282. A worker shall not board or leave a vehicle while it is in motion, except in case of an emergency.

Seating design

283. A worker transportation vehicle shall be equipped with seats that

- (a) are safely located and securely attached to the vehicle with a width of at least 41 centimetres for each passenger and an upholstered seat and seat back which provide normal and comfortable seating for passengers;
- (b) face to the front or the rear of the vehicle, unless installed otherwise by the vehicle manufacturer; and
- (c) provide a spacing of at least 66 centimetres measured between the face of the seat back at seat level and the back of the seat or other fixed object in front.

PART XIV CRANES, HOISTS AND OTHER LIFTING EQUIPMENT

Definitions

284. In this Part,

- (a) "anti-two block device" means a device that, when activated, disengages all crane functions whose movement may cause two-blocking; and
- (b) "safe working load" means the load a crane or hoist may safely lift in a particular situation, taking into account such factors as wind load, extremes of temperature and load sail area, which load may be equal to or less than the rated capacity or rated load.

Cranes, derricks and
hoists

285. Except as otherwise provided in these regulations, a crane, derrick, hoist and similar equipment shall be designed, constructed, erected, maintained, operated, inspected, disassembled and modified as specified by the manufacturer to meet the requirements of

- (a) the applicable CSA standard;

- (b) a professional engineer; or
- (c) other standard acceptable to the minister.

Identification

286. (1) A crane or hoist shall be permanently identified by the legible display of the manufacturer's name, model and serial number on the structure.

(2) Each major interchangeable structural component of a crane or hoist shall be legibly marked to identify compatibility with the crane or hoist, and shall be uniquely identified.

Rated capacity

287. (1) The rated capacity of a crane or hoist shall not be exceeded.

- (2) The safe working load as determined by
 - (a) the original manufacturer of the equipment;
 - (b) a professional engineer; or
 - (c) other persons with qualifications acceptable to the minister

shall not be exceeded.

Rated capacity
indication

288. (1) The rated capacity of a crane or hoist shall be permanently indicated on the superstructure, hoist and load block of the equipment.

(2) Notwithstanding subsection (1), rated capacity indication shall not be required where it is affected by

- (a) the vertical or horizontal angle of a boom or jib;
- (b) the length of a boom or jib;
- (c) the position of a load supporting trolley; or
- (d) the use or position of outriggers to increase the stability of the structure.

(3) Where the rated capacity is affected by a factor set out in subsection 284(2), a legible load chart, showing the rated capacity in all permitted working positions and configurations of use shall be

- (a) permanently posted on the equipment; or
- (b) issued to the equipment operator, who shall have the legible load chart available at all times when operating the equipment.

Boom angle indicator

289. A crane or hoist with a boom movable in the vertical plane shall be equipped with a device to indicate the boom angle where the rated capacity is affected by the boom angle, and the device shall be readable by the operator at the control station.

Boom extension and load radius indicators

290. A crane or hoist shall have a means or device to indicate the boom extension or load radius where the rated capacity of the equipment is affected by boom extension or load radius.

Support structure

291. The rated capacity of a hoist shall not exceed the capacity of the structure supporting the hoist.

Manual

292. (1) The manufacturer's manual for a crane or hoist shall be reasonably available at the workplace where the equipment is being used.

(2) The manual referred to in subsection (1) shall show the approved methods of erection, dismantling, maintenance and operation of the component parts and of the assembled crane or hoist.

(3) The portions of the manufacturer's manual, or a copy of them, related to safe operation of the crane or hoist shall be available at the workplace where the equipment is being used.

(4) A crane or hoist shall not be used in a manner other than that referred to in the manual referred to in subsection (1) unless that use has been approved by the manufacturer or by a professional engineer, and the modifications and deviation shall be recorded in the manual.

Inspection and maintenance

293. (1) A crane or hoist shall be maintained in accordance with the manufacturer's specifications and the applicable CSA standard and inspected at a frequency and to the extent required to ensure that each component is capable of carrying out its original function with an adequate margin of safety.

(2) A crane or hoist shall not be used until a condition that could endanger workers is remedied.

(3) A repair to a load bearing component of a crane or hoist shall be certified by a professional engineer or the original equipment manufacturer as having returned the component to a condition capable of carrying out its original design function with an adequate margin of safety.

Inspection and
maintenance re-
cords

294. (1) A log book or other record shall be provided and maintained for a crane, derrick or similar hoisting equipment showing the maintenance history and structural modification and inspection of the equipment.

(2) The log book or record referred to in subsection (1) shall be available at all times to the operator and to a worker concerned with the maintenance and safe operation of the equipment, and that worker shall be responsible for recording defects, operating difficulties, and the need for maintenance and all maintenance and modification work performed.

Certification

295. Before a crane or hoist is placed in service, a professional engineer shall inspect, proof test and certify in writing the rated capacity of a crane or hoist in accordance with criteria established by the manufacturer or applicable design or safety standard where

- (a) the equipment is new;
- (b) the origin or rated capacity of the equipment cannot be determined;
- (c) the continued safe use of the equipment cannot be assured due to its age or history;
- (d) repairs or modifications have been made to load carrying components;
- (e) modifications have been made which affect the rated capacity; or
- (f) the crane or hoist has been in contact with an electric arc or current.

Audible warning

296. An effective audible warning signal device shall be installed on a crane, derrick or other hoisting equipment where accidental contact with, or inadvertent release of, the load could injure a worker or cause damage to equipment.

297. A crane or hoist that handles molten metal shall have 2 holding brakes on the hoist mechanism.

Molten metal
Two-block protection

298. (1) On a telescopic and conventional boom crane, an anti-two-block device shall be provided for all parts of two-blocking which is capable of preventing damage to the hoist rope, boom-tip sheaves and to other machine components when hoisting the load, extending the boom or lowering a boom on a machine that has a stationary winch mounted to the rear of the boom hinge.

(2) The anti-two-block device referred to in subsection (1) shall prevent contact between the travelling block or headache ball and the boom tip.

Sheave guards

299. A running line sheave on a crane or hoist shall be equipped with a device to retain the rope in the sheave groove.

Ungrounded supply

300. An electric crane or hoist shall be grounded appropriately.

Controls

301. (1) A control on a crane or hoist shall have its function clearly identified and be maintained in good condition.

(2) Controls for a crane or hoist that is not operated from a cab shall be located to provide a safe distance between the operator and the load being lifted.

(3) A pendant control for a crane or hoist shall be supported independently from its electrical conductors.

Operator protection

302. The operator of a crane or hoist shall be protected against hazardous conditions such as falling or flying objects, swinging, and excessive heat or cold that could adversely affect the health or safety of the operator.

Cab windows

303. (1) A cab window on a mobile crane shall be made of safety glazing material that meets the requirements of ANSI/SAE z26.1-1990 "American National Standard for Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways - Safety Code".

(2) A cab windows on a crane or hoist which is not a mobile crane may be made of laminated glass, tempered glass, wired glass or clear polycarbonate plastic.

(3) An operator's cab window shall be kept clear and provide an unobstructed field of vision toward the load hook and shall have functional window wipers.

Storage

304. (1) The cab of a crane or hoist shall be kept free of unnecessary tools, material and equipment.

(2) Adequate storage facility shall be provided where it is necessary to keep tools or equipment in the operator's cab of a crane or hoist.

Fire extinguisher

305. A fire extinguisher with at least a 10 BC rating shall be immediately available in the cab of each crane.

Operator qualifications

306. (1) A crane or hoist shall only be operated by a qualified person who has been authorized to operate the equipment.

(2) An operator of a crane shall have an appropriate trade qualification valid in Newfoundland and Labrador or be an apprentice indentured in the appropriate trade in Newfoundland and Labrador, or have equivalent qualifications as determined by the Industrial Training Division of the Department of Education after the following dates:

- (a) for a mobile crane operator, other than a boom truck operator, after January 1, 2009;
- (b) for a tower crane operator in the construction industry, after January 1, 2009; and
- (c) for an operator of a boom truck with a rated capacity of more than 10 tonnes, after January 1, 2010.

Shift inspection

307. (1) An operator shall inspect the crane or hoist at the beginning of each shift and shall test control and safety devices in accordance with the manufacturer's specifications and the applicable safety code and regulations.

(2) A defect found by an operator during the inspection referred to in subsection (1) or during the use of the crane or hoist shall be:

- (a) recorded in the inspection and maintenance record log; and
- (b) reported to the supervisor who shall determine the course of action to be taken.

(3) Where a defect affects the safe operation of the crane or hoist, the equipment shall not be used until the defect has been remedied.

Load weight

308. (1) The weight of a load to be hoisted by a crane or hoist shall be determined by the equipment operator and communicated to a worker involved in the hoisting operation.

(2) Where the weight of a load cannot be determined, the crane or hoist to be used for the lift shall have either a load weight indicator or a load limiting device.

Calibration

309. A load weighing device, including a load movement indicator, on a crane or hoist shall be calibrated in accordance with the manufacturer's specifications or at more frequent intervals and the date of calibration shall be recorded in the inspection and maintenance records system.

Unsafe lift

310. An operator of a crane or hoist shall not attempt to move a load where he or she has any doubt that the load can be safely handled.

Swing hazards

311. A worker shall not remain within range of the swing of the load or equipment when the swing movement of the load, cab, counterweight or any other part of the crane or hoist creates a hazard and the operator shall not move the equipment when a worker is so exposed.

Position of equipment

312. (1) Equipment shall be positioned so that no moving part of the equipment will come within 60 centimetres of an obstruction in an area accessible to workers.

(2) Where the clearance required under subsection (1) cannot be provided, entry to an area referred to in subsection (1) shall be prevented by barriers or other effective means.

Multiple crane lift

313. (1) A multiple crane lift shall be under the direction of a qualified supervisor who shall be responsible for the safe conduct of the operation.

(2) A written procedure shall be prepared for a multiple mobile crane lift where the load on a crane exceeds 75% of its rated capacity or where other factors make the lift complex.

(3) A written procedure shall be prepared for a lift in which 3 or more cranes are used at one time to hoist a load.

(4) Multiple crane lift procedures shall address rigging details, wind speed, hoist line speed, crane travel speed, load distribution and other considerations as may be necessary.

(5) The procedures for a multiple crane lift referred to in subsection (2) shall be communicated to all persons involved before hoisting operations are commenced by the supervisor.

(6) A means of effective communication shall be established and maintained between all persons involved during a multiple crane lifting operation.

Travelling with a load

314. (1) Where an operator is travelling with a load, the operator shall ensure that the load is carried as close to the ground or grade as possible and that it is rigged to control load swing.

(2) Where necessary, a worker designated as the signaller shall walk ahead of a moving load and warn workers to keep clear.

Loads over work areas

315. (1) An employer shall arrange work to prevent passing a load over workers wherever possible.

(2) A crane or hoist operator shall not pass a load over workers unless no practicable alternative exists and the lifting procedure has been communicated to all affected workers.

(3) A worker shall not stand or pass beneath a suspended load except as permitted under subsection (2).

Unattended loads

316. A load shall not be left suspended from the load hook of a crane or hoist when an operator is not at the controls.

Hook position

317. The hook or load block of a crane or hoist shall be positioned over the load to prevent side loading of the crane when the load is hoisted.

Signals

318. The operator of a crane or hoist shall act only on the directions of a designated and competent signaller where the operator does not have a clear and unobstructed view of the load hook and load throughout the whole range of the hoisting operation.

Alternative to hand
signals

319. Two-way radio or other audio or video systems shall be used if distance, atmospheric conditions or other circumstances make the use of hand signals hazardous or impracticable.

Dedicated radio
system

320. (1) A two-way radio system used to direct crane or hoist movement shall operate on a dedicated radio channel.

(2) Multi-channel radios shall not be permitted for use to direct crane or hoist movement.

Unhooking loads

321. A load on a crane or hoist shall be safely landed and supported, before being unhooked.

Riding hook or load

322. A worker shall not ride on a load, sling, hook or any other rigging equipment.

Induced voltage

323. (1) Before a crane or hoist is operated near a source such as a radio transmitter or energized high voltage electrical equipment capable of inducing an electric charge which may pose a hazard to workers

(a) the crane or hoist shall be effectively grounded;

(b) any induced electric charge shall be dissipated by applying grounding cables or by other effective means before the workers come into contact with the load; and

(c) all flammable materials shall be removed from the immediate work area.

(2) Paragraphs (1)(a) and (b) do not apply where work is being performed on a power system in accordance with Part XXVI.

Uptravel limit

324. (1) A bridge, gantry or other overhead travelling crane shall be equipped with a device that will prevent hook travel beyond the safe upper limit at all design hoist speeds.

(2) The uptravel limit device required under subsection (1) shall be tested at the beginning of each shift, and the test results recorded in the equipment record system.

Electrical conduc-
tors

325. Electrical conductors for the bridge and trolley shall be located or guarded to prevent contact by workers.

Power shutoff

326. An electrically powered crane shall have a means for the operator to safely interrupt the main electric circuit under any load condition.

Direction markings

327. A bridge, gantry, or overhead travelling crane operated by a pendant or remote control shall have markings on the crane structure or building, visible to the operator, clearly indicating the direction of hook, bridge and trolley motions compatible with those marked on the controls.

Manually powered hoists

328. (1) A hand operated hoist shall be provided with a ratchet and pawl, load brake or other mechanism which shall hold the load at a desired height.

(2) A crank operated winch that is not fitted with automatic load brakes shall be provided with a means of preventing the crank-handle from slipping off the crank-shaft while hoisting.

(3) A crank handle shall be removed from the crank shaft before the load is lowered on the winches referred to in subsection (2).

(4) Subsections (2) and (3) do not apply where a crank handle have been replaced by permanently secured, smooth rimmed hand wheels.

Cranes on floating supports

329. (1) The rated capacity and allowable operating radii of a crane or boom truck designed for use on land shall be modified where it is used on a floating support, considering list and trim for each installation as specified by the crane manufacturer or a professional engineer.

(2) A mobile crane or boom truck equipped with outriggers, operating on a floating support, shall be supported on its outriggers during lifting operations unless the instructions required by subsection (1) specifically allow otherwise.

(3) Where a crane or boom truck is used on a floating support, a device to measure the list of the floating equipment shall be provided and be readable by the operator while in the operating position.

(4) A mobile crane or boom truck being used on a floating support shall be blocked and secured as necessary to prevent it shifting relative to the bearing surface of the floating support.

Level turntable

330. (1) A mobile crane or boom truck shall be operated with the turntable level, except as permitted by the manufacturer.

(2) Level indicating devices shall be provided to permit the operator to determine whether the crane turntable or boom truck frame is level within the limits specified by the manufacturer.

Outriggers

331. (1) Outrigger beams on a crane or boom truck shall be marked to indicate when the necessary extension has been achieved.

(2) Floats shall be secured to the outrigger jacks of a crane or boom truck when outriggers are used.

Tires

332. Mobile crane or boom truck tire type, condition and inflation shall be as specified by the manufacturer when lifting on rubber.

Supporting surface

333. (1) A mobile crane or boom truck shall only be used on a surface capable of supporting the equipment and any hoisted load without failure.

(2) Where a crane or hoist will be used adjacent to an excavation, slope or backfilled area, a qualified person shall determine the location for the equipment for hoisting operations.

Travelling with a load

334. A mobile crane or boom truck may travel with a suspended load only where the crane manufacturer specifies load ratings for this operation.

Boom inspection

335. (1) A crane boom used for driving piles with a vibratory hammer shall be inspected in accordance with good engineering practice, and certified safe for continued use by a professional engineer at least every 3 months, and before being returned to lifting service.

(2) A crane boom used with a vibratory pile extractor or for dynamic compaction shall be inspected in accordance with good engineering practice, and certified safe for continued use by a professional engineer at least monthly, and before being returned to lifting service.

Tower cranes

336. (1) The foundation for support of a tower crane shall be certified by a professional engineer.

(2) The design of shoring and bracing to support a tower crane shall be certified by a professional engineer, and the shoring and bracing shall be constructed as specified by the design.

(3) Where a tower crane is supported partially or fully by, or connected to, a building or structure, the connections to and any bracing or shoring of the building or structure necessary to support the tower crane shall be certified by a professional engineer.

Verification before
use

337. (1) A tower crane erector shall verify that the crane has been erected according to the manufacturer's specifications before it is put in service.

(2) Where a tower crane is not erected according to the manufacturer's specifications a professional engineer shall certify that it is safe for use before the crane is put in service.

(3) Before a tower crane is used following repositioning of the mast, a professional engineer shall certify that the parts of the crane affected by the climbing process have been properly installed and any required reshoring for and bracing to the supporting structure is in place.

Identification

338. The structural components of a tower crane shall be uniquely identified and that unique identification shall be used when referring to a structural component in reports for inspection and testing, and certifications for repairs and modifications.

Structural inspection

339. (1) Before erection of a tower crane, the structural components of the crane shall be

- (a) inspected to determine their integrity by a qualified person using non-destructive testing (NDT) methods meeting the requirements of the Canadian General Standards Board (CGSB); and
- (b) repaired as necessary and such repairs certified by a professional engineer as safe for use.

(2) Where a tower crane remains erected at a workplace for more than 12 months

- (a) its structural components shall be inspected to determine their integrity by a qualified person using NDT methods meeting the requirements of the CGSB; and
- (b) after the inspection required by paragraph (a), the crane, including any necessary repairs, must be certified by a professional engineer as safe for use.

(3) The inspection and certification of a tower crane scheduled to be dismantled within 15 months of erection may be delayed until prior to the next erection of the crane.

Structures kept
clean

340. A tower crane structure shall be kept clean and free of concrete and other debris that might hinder inspection and the base area shall be clear of debris and the accumulation of water.

Communication

341. A tower crane operator shall have an effective two-way voice communication with another tower crane or equipment operator where contact between the tower crane and another tower crane or equipment operator could occur.

Wind limitations

342. In the absence of the manufacturer's specifications for maximum permitted wind speed during crane operation, the maximum allowable wind speed in which a tower crane may be used is 50 kilometres per hour as measured at the operator's cab, or less if a load cannot be handled safely because of wind.

PART XV RIGGING

Definitions

343. In this part,

- (a) "design factor" means the theoretical reserve capability of a product, usually determined by dividing the breaking strength by the working load limit; and
- (b) "rigging" means fibre ropes, wire ropes, chains, slings, attachments, connecting fittings and associated components.

Qualified riggers

344. Rigging and slinging work shall be done by or under the direct supervision of a qualified worker familiar with the rigging to be used and with the code of signals acceptable to the minister for controlling hoisting operations.

Use of rigging

345. The load applied to any rigging or rigging assembly shall not exceed the working load limit.

Component identification

346. (1) Rigging fittings shall be marked with the manufacturer's identification, product identifier and the working load limit or sufficient information to readily determine the working load limit.

(2) The working load limit of existing fittings not identified as required by subsection (1) shall be determined by the manufacturer or a professional engineer.

Design factors

347. (1) Except as otherwise specified in these regulations, the design factor based on breaking strengths for a rigging component shall be at least equal to the values given in the following table:

Component	Design Factor
Nylon fibre rope sling	9
Polyester rope sling	9
Polypropylene rope sling	9
Alloy steel chain sling	4
Wire rope sling	5
Metal mesh sling	5
Synthetic web sling	5
Chain fittings	5
Wire rope sling fittings	5
Other fittings	as specified by manufacturer
Nonrotating wire rope	as specified by manufacturer but not less than 5
Conventional wire rope	5

(2) The design factor for a rigging assembly used to support a worker shall be at least 10.

Natural fibre rope

348. Natural fibre rope shall not be used for hoisting.

Wedge socket connections

349. Where a wedge socket is used as a wire rope termination, the dead end of the rope shall be secured to prevent release of the wedge or rope slippage at the socket.

Open hook restriction

350. A hook shall have a safety latch or other means that will retain slings, chains, or other similar parts, under slack conditions.

351. (1) A shackle-pin, heel-pin and similar device shall be secured against dislodgement.

Securing pins

(2) The pin in a screw-pin type shackle shall be wired or otherwise secured against rotation when used in applications that may cause the pin to loosen.

Replacing pins

352. A shackle-pin shall not be replaced with a bolt or other make-shift fitting.

Securing ropes to drums

353. (1) A rope shall be secured to its winding drum, unless the line is required to automatically disengage from the drum.

(2) A rope shall not be fastened to a drum by a knot tied in the rope.

Wraps required

354. At least 3 full wraps of rope shall remain on winding drums where the load hook is in the lowest position.

Sheaves

355. A sheave shall be

- (a) correctly sized for the rope;
- (b) equipped with a device to retain the rope within the groove; and
- (c) removed from service if it has a damaged groove or flange.

Guylines

356. (1) The strength of each guyline and its anchor shall exceed the breaking strength of the load-line rigging arrangement.

(2) A guyline anchor shall be placed so that the interior angle between the guyline and the horizontal plane does not exceed 45°.

(3) Guylines shall be arranged so that the hoisting line pull in any direction is shared by 2 or more guys.

(4) Guylines and anchor systems, if certified by a professional engineer, may deviate from the requirements of subsections (1) to (3).










Spooling tape

357. (1) A worker shall not use his or her hands or feet or any hand-held object to guide the rope when spooling the rope onto a drum.

(2) Notwithstanding subsection (1), in an emergency a worker may use a steel guide bar of acceptable design to guide the rope onto the drum but the line speed shall be kept as low as practicable and the worker shall be positioned to be clear of the drum.

Termination effi-
ciencies

358. Except as otherwise permitted by the manufacturer, the working load limit shall be reduced in accordance with the efficiency rating for the type of termination specified as follows:

Open Type	Closed Type
	
SWAGED SOCKET	100%
	
WIRE ROPE SOCKET - SPELTER ATTACHMENT	100%
	
PRESSED SLEEVE LOOP BACK THIMBLE ATTACHMENT	
25mm (1 in) diameter and smaller	90%
29mm (1 1/8 in) diameter and larger	95%
	
FLEMISH LOOP WITH MECHANICAL SLEEVE ATTACHMENT	
25mm (1 in) diameter and smaller	95%
29mm (1 1/8 in) diameter and larger	92.5%
	
WEDGE SOCKETS (depending on design)	75 -90%
	
CLIPS (number of clips varies with size of rope)	80%
	
THIMBLE SPLICE - HAND TUCKED	
6mm (1/4 in)	90%
8mm (5/16 in)	89%
10mm (3/8 in)	88%
11mm (7/16 in)	87%
13mm (1/2 in)	86%
16mm (5/8 in)	84%
19mm (3/4 in)	82%
22mm (7/8 in)	80%
	
LOOP SPLICE - HAND TUCKED	
Efficiencies of loop splice are the same as those given for thimble splice.	

Wire rope clips

359. (1) Where a manufacturer's specifications for installing and using wire rope clips cannot be determined, the number of clips and the installation torque shall be in accordance with the following table:

Diameter of rope (millimetres)	Number of clips	Spacing between clips (centre to centre in millimetres)	Torque (newton metres)
6	2	38	20
8	2	51	41
10	2	57	61
11	2	64	88
13	3	76	88
16	3	102	129
19	4	114	176
22	4	133	305
25	4	152	305
29	5	178	305
32	5	203	488
38	6	229	488
44	7	267	630
51	8	305	881
54	8	330	881
57	8	356	881

Restriction on foldback eyes

360. (1) A wire rope termination using a swaged fold back eye shall be identified with a serial number or other unique identification code and proof-tested before being placed in service and a record of the proof test shall be kept available for the service life of the termination.

(2) A swaged fold back eye termination shall be identified with the working load limit.

Slings standards

361. Except where otherwise required by these regulations, wire rope, alloy steel chain, metal mesh, synthetic fibre rope and synthetic fibre web slings shall meet the requirements of ASME B30.9-1990, "Slings".

Inspection before use

362. Slings and attachments shall be visually inspected before use and defective equipment shall be immediately removed from service.

Storage

363. A sling shall be stored to prevent damage when not in use.

Knots

364. A sling with a knot shall not be used.

365. Where a sling is applied to a sharp edge of a load, the edge or the sling shall be protected to prevent damage to the sling.

Sharp edges

Slinging loads

366. (1) A sling shall be selected and used to prevent slipping or overstressing the sling or the load.

(2) A load consisting of 2 or more pieces of material over 3 metres long shall be slung using a 2-legged sling arrangement that is positioned to keep the load horizontal during the lift and each sling shall be choked around the load with a double wrap.

Multiple piece lifts

367. For each multiple piece lift,

- (a) each member of the lift that is being delivered to a different spot shall be independently slung back to the main load hook or master link using graduated length slings;
- (b) a lifted member shall not support another lifted member; and
- (c) a crane equipped with power controlled lowering shall be used.

Below-the-hook
lifting devices

368. (1) A spreader bar or other specialized below-the-hook lifting devices shall be constructed, inspected, installed, tested, maintained and operated in accordance with the requirements of ASME B30.20-1993 "Below-the-Hook Lifting Devices" and its working load limit shall be certified by a professional engineer or established by its manufacturer.

(2) A spreader bar or specialized below-the-hook lifting device shall display a nameplate or other permanent marking showing the

- (a) manufacturer's name and address;
- (b) serial number;
- (c) weight of the device if more than 45 kilograms; and
- (d) working load limit.

Part of lifted load

369. A spreader bar and other specialized below-the-hook lifting device shall be considered part of the lifted load.

**PART XVI
TRAFFIC CONTROL**

Traffic control

370. (1) For the purpose of this Part, "traffic control" includes

- (a) patrol vehicles;
- (b) traffic lights;
- (c) signs;
- (d) barricades;
- (e) cones;
- (f) detours;
- (g) traffic control persons; and
- (h) other techniques and devices necessary according to the particular circumstances.

(2) Where the movement of vehicular traffic constitutes a hazard to workers, effective traffic control shall be provided.

(3) Traffic control procedures shall at minimum meet the requirements of the Department of Transportation and Works "Traffic Control Manual for Roadway Work Operations" and all relevant specifications.

(4) Notwithstanding subsection (3), an officer may require those additional or alternate traffic control procedures and equipment that are necessary in the particular circumstances.

Traffic control
person

371. (1) A traffic control person shall be employed

- (a) according to the criteria established by the Department of Transportation and Works "Traffic Control Specification";
or
- (b) as may be required by an officer and as may be necessary under the particular circumstances.

(2) An employer shall ensure that a qualified traffic control person demonstrate a sufficient knowledge of traffic control procedures so as to ensure the health and safety of workers and the general public.

(3) A traffic control person shall

(a) stand in a safe position, preferably on the driver's side of the lane under the traffic control person's control, be clearly visible, and have an unobstructed view of approaching traffic; and

(b) be positioned at least 25 metres away from the work area unless circumstances or space requirements such as working at or near an intersection dictate otherwise.

(4) Where 2 or more traffic control persons are working as a team, the employer shall ensure that one traffic control person is responsible for traffic co-ordination and for the initiation of changes in the direction of traffic flow in order to create a cycle which will result in minimum traffic delay and maximum protection for the workers.

(5) Traffic control persons shall perform their duties responsibly and in accordance with the Department of Transportation and Works "Traffic Control Manual".

Traffic control
signals

372. (1) An employer shall ensure that where traffic control persons are working as a team, communications signals shall be determined and understood by personnel using them prior to the commencement of the flagging operations.

(2) Where traffic is diverted onto dusty surfaces, good visibility shall be maintained by the suppression of dust through periodic application of an approved substance.

PART XVII CONSTRUCTION, EXCAVATION AND DEMOLITION

Definitions

373. In this Part,

(a) "adjacent to an excavation" means within a distance less than or equal to the overall depth of the excavation measured from a vertical line through the toe of the excavation face;

- (b) "construction project" means erection, alteration, repair, dismantling, demolition, structural or routine maintenance, painting, land clearing, earth moving, grading, excavating, trenching, boring, drilling, blasting, concreting, installation of any machinery or other work considered to be construction by the minister;
- (c) "demolition" means the tearing down, destruction, breakup, razing or removal of the whole or part of a building or structure, or of free-standing machinery or equipment that is directly related to the function of the structure;
- (d) "excavation" means a cut, cavity, trench or depression in the earth's surface resulting from rock or soil removal;
- (e) "formwork" includes the foundation, supporting structure, and mould into which concrete will be placed;
- (f) "formwork designer" means the professional engineer responsible for the design of formwork;
- (g) "tilt-up construction" means a system of building construction in which concrete wall panels are placed in position in the permanent structure and temporarily braced or supported; and
- (h) "trench" means an excavation less than 3.7 metres wide at the bottom, more than 1.2 metres deep, and of any length.

Temporary floors

374. (1) During the erection of a building or structure of skeleton construction, a temporary floor, decking or formwork shall be installed at the main working level where work is being done.

(2) Where compliance with subsection (1) is not practicable, a temporary floor or other effective means of protection shall be installed not more than 2 levels or 8 metres below the main working level.

(3) Subsections (1) and (2) do not apply to the initial connection of structural members where it is not practicable to provide a floor or decking.

(4) A safe means of access and egress to a main working level referred to in subsection (1) shall be provided.

(5) A stairway comprised, at a minimum, of framing, treads and a handrail shall be provided to each floor level before construction of the next floor or deck surface is undertaken, and the treads on the stairway shall not create a tripping or slipping hazard.

Protection from
falling materials

375. (1) Where falling material could endanger workers

- (a) the danger area shall be barricaded or effectively guarded to prevent entry by workers, and conspicuous warning signs shall be displayed on all sides and approaches;
- (b) adequate protective canopies shall be installed over the danger area; or
- (c) adequate catch platforms or nets shall be provided to prevent materials from falling into areas accessible to workers.

(2) Temporary washroom facilities, offices and similar structures on a construction site shall be

- (a) located outside areas where there is the potential of being hit by falling materials; or
- (b) covered by adequate protective canopies.

(3) Protective canopies shall be designed and constructed to safely support all loads that may reasonably be expected to apply to them.

Chutes

376. (1) Chutes shall be provided where the free fall of materials or debris being removed exceeds 6 metres.

(2) Vertical chutes shall be completely enclosed and have gates at each point of entry.

(3) The discharge area of a chute shall be barricaded or effectively guarded to prevent workers being injured by falling or flying debris and conspicuous signs shall be posted near a chute outlet to warn of danger.

Glass panels

377. A glass panel installed during construction shall be marked to clearly indicate its presence or effectively guarded at the time of installation.

378. During the erection or dismantling of a structure or equipment, the employer shall ensure that a partially assembled structure or component is to safely withstand loads likely to be imposed on it.

Supervision

379. (1) A qualified supervisor shall supervise the erection and use of formwork and falsework.

(2) A worker shall be properly instructed on the hazards that he or she may be exposed to and on the precautions to be taken while around or on formwork or falsework.

Concrete placing hazards

380. (1) A protruding end of reinforcing steel that is hazardous to a worker shall be removed or effectively guarded.

(2) Where a worker is required to be underneath the formwork during a concrete pour or placement of another significant load, the worker shall be restricted from the areas where the loads are placed.

(3) A worker shall be restricted from the area under a portion of formwork where a load or concrete has been placed until it can be ensured that the formwork will withstand the load.

(4) Placement of concrete or other loads shall cease in the event of weakness, undue settlement or excess distortion of formwork and may only restart after the formwork has been repaired or strengthened as specified by a professional engineer.

(5) A load shall not be applied to an uncured concrete structure except as permitted by the erection.

Inspections

381. Immediately prior to the placement of concrete or other loading, an employer shall ensure that the concrete formwork and falsework is inspected by a qualified person.

Pre-use inspections

382. (1) An operator shall inspect a concrete placing boom or mast and test its safety and control devices before use on each shift and record the results of the inspection and tests.

(2) A defect found in the concrete placing boom or mast shall be recorded and reported immediately to the supervisor or employer who shall determine the course of action.

(3) Where a defect may affect the safe operation of the concrete placing boom or mast, the equipment shall not be used until the defect has been remedied.

Controls

383. A control for a concrete placing boom or mast shall have its function clearly identified.

Emergency shutoff

384. A concrete pump shall have a clearly labelled emergency stop switch near the hopper.

Agitator guarding

385. (1) Concrete pump agitator guarding shall be maintained to the pump manufacturer's specifications, with reasonable allowance for wear.

(2) Bent bars in a concrete pump agitator grill guard shall be repaired.

(3) Concrete pump grill bar spacing may be increased to a maximum bar spacing of 8 centimetres where

(a) pumping concrete mixes with a slump of 5 centimetres or less; and

(b) specific instructions are given to the crew regarding the hazard present due to the larger openings in the grill guard.

(4) The distance from the grill bars to the concrete pump's agitator shall be at least 7.5 centimetres.

(5) A concrete pump agitator grill guard shall be hinged or bolted in place.

(6) A person shall not stand on the grill when the concrete pump or agitator is running.

Concrete pump lines

386. Where the disconnection of concrete pump discharge line couplings could cause injury to workers, the discharge line shall be guarded and the guards shall be positioned so as to deflect a jet of concrete resulting from disconnection in a safe direction..

Equipment inspection

387. A concrete placing boom and mast shall be

- (a) inspected in accordance with good engineering practice at intervals not exceeding 12 months;
- (b) repaired as necessary; and
- (c) certified safe for use by a professional engineer, the manufacturer or the manufacturer's authorized agent.

Repair certification

388. Replacement parts used for repair of a concrete placing boom or mast shall meet or exceed the original manufacturer's specifications or be certified by a professional engineer.

Restriction on use

389. A concrete placing boom or mast shall not be used to hoist loads.

Operator's duties

390. The operator of a concrete placing boom or mast shall

- (a) have full control of the pump and placing equipment controls whenever the equipment is operating; and
- (b) not engage in other duties while operating the concrete pump and placing boom or mast.

Hopper signal device

391. Where a concrete placing boom operator is unable to see and monitor the hopper on the concrete pump from every location the operator must be present during the pumping activity, there shall be a device at the hopper for the concrete delivery truck driver and other workers to signal the pump operator in the event of a problem at the pump or hopper.

Crawl boards and ladders

392. (1) Crawl boards and ladders used for roof work shall be securely fastened over the ridge of the roof or be otherwise effectively anchored.

(2) An eavestrough shall not be used to support a crawl board or ladder on a roof.

Chutes and hoists

393. The roof edge about a chute, bitumen spout and material hoist shall have guardrails meeting the requirements of sections 28 and 29 on each side of such a work area.

Underground utilities

394. (1) Before excavating or drilling with powered tools and equipment, the location of all underground utility services in the area shall be

accurately determined and any danger to workers from those services shall be controlled.

(2) Excavation and drilling work in proximity to an underground service shall be undertaken in conformity with the requirements of the owner of the service.

(3) Pointed tools shall not be used to probe for underground gas and electrical services.

(4) Powered equipment used for excavating shall be operated so as to avoid damage to underground utility services and danger to workers.

Removing nearby hazards

395. Trees, utility poles, rocks and similar objects adjacent to an area to be excavated shall be removed or secured if they could endanger workers.

Structural integrity

396. (1) Where a structure is to be demolished in whole or in part, the structure and all adjoining structures, the integrity of which could be compromised by the demolition, shall be supported to the extent and in a manner prescribed by a professional engineer.

(2) The design of the support system referred to in subsection (1) shall include a schedule, based on the stages of demolition, for installation of the components of the support system, and a copy of the support system, design and schedule shall be available at the demolition site.

(3) Where salvage is taking place before or during the demolition process, the integrity of the structure shall be maintained.

(4) Engineered demolition plans and designs shall not be required where the nature and method of demolition will not endanger workers or compromise the stability of adjoining grounds and structures.

Hazardous materials

397. Before work begins on the demolition or salvage of machinery, equipment, buildings or structures, the employer or owner shall

(a) inspect the site to identify asbestos, lead, biological or other heavy metal or toxic, flammable or explosive materials that may be handled, disturbed or removed;

- (b) make the results of the inspection available at the worksite, including any drawings, plans or specifications showing the location of any hazardous substances;
- (c) ensure that any hazardous materials found are safely contained or removed; and
- (d) where hazardous materials that were not identified in the inspection under paragraph (a) are discovered during demolition work, ensure that all work ceases until such materials are contained or removed.

Disconnecting
services

398. Demolition shall not proceed until all electric, gas and other services that might endanger a worker have been disconnected as required by the owner of the applicable utility.

Glass removal

399. (1) Glass in a building or other structure that could endanger workers shall be removed before demolition commences.

(2) Glass removal shall proceed in an orderly manner from the top to the bottom of the structure.

Stabilizing walls

400. Where a dangerous or unstable wall is to be left standing, it shall be adequately braced.

Dismantling build-
ings

401. (1) During the dismantling or renovation of a building or structure, materials of a size or weight that may endanger workers shall not be loosened or allowed to fall, unless procedures are used that will adequately protect workers.

(2) Demolition shall proceed in an orderly manner from the top to the bottom of the structure.

Stairways

402. Stairways, complete with handrails, shall be left intact until access to the level served by the stairway is no longer required.

Part XVIII **EXCAVATION, UNDERGROUND WORK AND** **ROCK CRUSHING**

Entrapment danger

403. (1) A worker shall not enter a place where there is a danger of entrapment unless safe access has been provided by catwalks, walkways or other acceptable means or he or she wears retrieval equipment

satisfying the requirements of Part XXVII and is attended by another worker who is stationed, equipped and capable of immediately effecting a rescue.

(2) An area in which materials may be dropped, dumped or spilled shall be barricaded and protected by warning signs to prevent the inadvertent entry of workers.

Pre-excavation
requirements

404. (1) Before beginning excavation work with power tools or equipment in an area likely to have underground conduits, cables or pipelines, the location of the service facilities shall be accurately determined by the employer and communicated to the employee.

(2) Powered equipment shall not be used in a manner that will expose workers to harmful effects resulting from the damage to service facilities.

(3) Trees, boulders or other material located within 1.83 metres of the area to be excavated shall be removed before excavation begins.

(4) A worker shall not enter an excavation over 1.22 metres deep unless

(a) the sides of the excavation are sloped to a safe angle and have been secured by the use of sheet piling, shoring and bracing or a trench box; or

(c) the worker is protected by other effective means.

(5) Added loads shall be considered in the design of the support system where

(a) equipment or other heavy objects are located or operated close to the edge of excavations;

(b) excavations are adjacent to or abutting buildings or other structures; or

(c) hazards are created by vibration from nearby equipment or passing vehicular traffic.

(6) Where there is a danger of undermining adjacent foundations, excavation work shall be done in short sections and the building walls shall be effectively shored or braced.

405. (1) Where a worker is required to enter an excavation greater than 1.22 metres deep, a ladder shall be provided in the immediate area where the worker is employed, extending from the bottom of the excavation to at least 0.91 metres above the top of the excavation.

(2) Walkways entering excavations shall be

(a) not less than 50.80 centimetres wide;

(b) equipped with guardrails when over 1.22 metres above grade; and

(c) provided with cleats when the grade is over one in 6.

(3) A runway which is used by mobile equipment shall be equipped with curbs.

Removal of material

406. (1) A worker shall not permit excavated material to remain

(a) within 1.22 metres of the edge of a trench-type excavation; or

(b) within 1.52 metres of the edge of a pit-type excavation.

(2) Where skips or buckets are used to remove material from excavations, a horizontal shoring member shall be protected against dislodgement by the installation of vertical planking.

Faces and slopes

407. (1) Where work is being carried on in excavation

(a) the slopes shall be scaled and trimmed or otherwise stabilized to prevent slides of material or falls of rock,

(b) overhanging banks and dangerous trees or stumps and overburden shall be removed in the area within 5 metres from the edge of the pit or quarry; and

(c) means shall be provided to prevent the dangerous erosion of the slope by surface water.

(2) Except where the minister, in writing, permits otherwise, in a pit, quarry or similar excavation

(a) the height of a face of which the material is not at a safe angle of repose shall not be greater than the height which can be safely reached by the equipment being used;

(b) a bench height for sand, gravel and unconsolidated materials shall not exceed 3 metres;

(c) the method of mining by undercutting shall not be used; and

(d) in open pit mining, the height of benches shall not exceed 20 metres and work shall be done in benches at an angle of safety.

(3) A worker engaged in scaling, sloping or trimming banks or faces shall use a fall protection system that meets the requirements of Part X.

(4) Scaling and similar work shall be undertaken from the top down and the areas into which material may fall shall be kept clear of workers and equipment.

Excavation safety

408. (1) Excavations shall be guarded by substantial railings or barriers to prevent workers from falling in to excavations.

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

(3) The accumulation of water in an excavation shall be prevented by effective means.

(4) Safety berms shall be installed along haulage roads to pits and quarries and shall be at least half the height of the largest piece of equipment being used to haul materials.

Underground work-
ings

409. (1) In an underground place of employment, including an excavation, natural entry, tunnel, raise, shaft or chamber, that is not a mine within the meaning of the *Mining Act*, the employment of workers shall be in accordance with

(a) standard engineering practices for the type of work being performed;

- (b) the applicable requirements of these regulations; and
- (c) additional requirements that the minister may consider necessary.

(2) Where an employer proposes to use methods or equipment that are new or do not comply with standard practices in underground workings, he or she shall first submit details of the proposed methods and equipment to the minister for approval and the submission shall include evidence of engineering feasibility with respect to the safety of the workers.

Internal combustion
engines

410. An internal combustion engine fuelled by gasoline, naphtha or liquefied petroleum gas shall not be operated in an underground project.

Air quality

411. (1) An employer shall ensure that

- (a) the respirable air in all underground workings is free from hazardous amounts of dusts, vapours and gasses, and does not contain less than 20% oxygen; and
- (b) a worker does not work or remain and is not permitted or caused to work or remain in a place underground where the air contains dust, fumes, smoke or other impurities in injurious quantities unless protected by breathing apparatus acceptable to the minister and appropriate for the hazard involved.

(2) A worker employed in surface rock-excavating workings shall be protected from harmful dust concentrations by

- (a) the use of water spray;
- (b) dust removal by mechanical means; or
- (c) a combination of paragraphs (a) and (b).

(3) Where a worker is exposed to dusting resulting from loading, transporting or conveying rock at surface operations, the dust shall be reduced to non-harmful concentrations by the application of water or by other effective methods.

(4) At underground rock-excavating workings, means acceptable to the division shall be employed to effectively suppress the dust caused by drilling or handling rock.

(5) A rock drill shall be equipped with a water jet, spray or other device acceptable to the assistant deputy minister to effectively suppress drilling dust.

(6) Subsection (5) does not apply to hand-drilling procedures.

(7) A water spray shall be used in every development heading unless written permission has been received from the assistant deputy minister to work the heading without a water spray.

(8) Effective dust-control measures shall be employed during the handling and loading of broken rock.

(9) Mechanical ventilation shall be provided to produce a minimum air volume of 15.24 cubic metres per minute per square metres of working face in the work area.

(10) Rock-crushing plants shall be equipped with dust controls and

(a) rock crushers, including jaw, roll, cone or hammermills shall have an adequate mechanical exhaust system;

(b) the screen discharge hopper shall be enclosed and shall have an adequate mechanical exhaust system or an adequate water spray system;

(c) screens shall have partial covers and shall have an adequate mechanical exhaust system or an adequate water spray system;

(d) material-transfer points shall have an adequate mechanical exhaust system or an adequate water spray system; and

(e) discharge from a mechanical exhaust system shall be located to prevent the recirculation of contaminated air to areas occupied by a worker.

Diesel engines
underground

412. (1) Where diesel engines are used underground, mechanical ventilation shall effectively ventilate all work areas.

(2) Where a diesel engine is used

(a) it shall be equipped with suitable exhaust-gas conditioners which are properly maintained and regularly serviced;

(b) gasoline or other highly volatile fuels shall not be used with a starting mechanism or device;

(c) instructions shall be issued to all workers to shut down all engines immediately if ventilation ceases to function, and to keep the engines shut down until ventilation is again made effective; and

(d) a fire suppression system, suitable for extinguishing oil fires shall be provided for each engine.

(3) Tests for carbon monoxide and nitrogen dioxide shall be conducted by a qualified person at least weekly.

(4) Where a diesel engine operates underground, records shall be maintained and be accessible to all workers concerned and shall include

(a) inspection and certification of each shift for the condition of the diesel engine and exhaust-gas conditioner;

(b) gas inspection tests for each shift made for carbon monoxide and nitrogen dioxide, including the time and location of tests;

(c) at least once a week, or as directed by the inspector, the volume of ventilating air delivered to each underground heading;

(d) tests for combustible gas, including location, time and results as directed by an inspector;

(e) an unusual occurrence of findings or action; and

(f) the signature of the worker recording each entry.

413. (1) The walls, roof and face of an underground working shall be kept free of loose or fissured rocks and stones and ground support shall be installed where necessary.

(2) An adequate supply of properly dressed scaling bars or other scaling equipment shall be available at the worksite for scaling.

PART XIX GENERAL BLASTING

Definitions

414. In this Part,

- (a) "blaster" means a person who holds a valid blaster's certificate granted by the province;
- (b) "blasting activity" includes storing, handling, transporting, preparing and using explosives, and drilling conducted at a blasting area or in relation to the use of explosives;
- (c) "blasting area" means the zone extending at least 50 metres in all directions from the place in which explosives are prepared, handled or loaded for firing, or in which misfired explosives exist or are believed to exist and from which hazards shall be excluded to avoid an accidental explosion;
- (d) "blasting machine" means an electrical or electro-mechanical device which provides electrical energy for the purpose of energizing electric detonators and electrical circuits for continuity, resistance, stray currents and other pertinent measurements;
- (e) "blasting switch" means a device used to permit the firing of electric blasting circuits from power lines and constructed so that the door may be closed and locked with the switch in the "OFF" position;
- (f) "danger area" means the zone in which there exists a possibility of hazard to person or property from fly rock, fume, air blast or ground vibrations;
- (g) "day box" means a portable unit used for keeping explosives in during the day and which meets the requirements of

"Storage Standards for Industrial Explosives" as published by the Explosives Division of Natural Resources Canada;

- (h) "detonator" includes electric blasting caps of instantaneous and delay types, blasting caps for use with safety fuses, detonating cord, delay connectors and non-electric instantaneous and delay blasting caps which use detonating cord, shock tube, gas tube and any other replacement for electric leg wires and any other similar device;
- (i) "explosive" means a substance, including a detonator or primed explosive, that is manufactured or used to produce an explosion by detonation or deflagration and that is regulated by the *Explosives Act* (Canada), but does not include ammunition for weapons or fireworks;
- (j) "extraneous electricity" means unwanted electrical energy greater than 50 milliamps that is present at the blasting area that could enter an electric blasting circuit including stray current, static electricity, radio frequency energy and time-varying electric and magnetic fields;
- (k) "magazine" means a fixed unit used for the unattended storage of explosives overnight and which meets the requirements of the "Storage Standards for Industrial Explosives" as published by the Explosives Division of Natural Resources Canada;
- (l) "misfired hole" means a charge of explosives in a hole or part of a hole which for any reason has failed to fire as planned and "misfire" has a corresponding meaning;
- (m) "prime charge" means to position a detonator for use in firing an explosive charge; and
- (n) "primed explosive" means an explosive containing a detonator.

Employer's responsibility

415. Nothing in this Part relieves an employer of the responsibility

- (a) to provide adequate direction and instruction of workers and to assign work only to those workers who are qualified;

- (b) to ensure that measurement of air volume is taken at the end of the ventilation duct near the working face and that records are maintained of all air-volume measurements; and
- (c) to ensure that a worker does not return to the scene of a blasting operation until the air contaminants have been reduced to concentrations below their respective threshold limit values and the concentration of oxygen is at a respirable level.

Role of certified
blaster

416. (1) Blasting shall be performed under the direct supervision of a blaster who is present at the project and who holds a valid blaster's certificate which authorizes the performance of the particular type of work that the blaster is to conduct or supervise.

(2) Direct supervision under subsection (1) includes a requirement that the blaster have a direct line of sight of the work area.

(3) The site supervisor shall consult with a blaster so that both are aware of all work being conducted in a blasting area and no work shall be conducted in a manner which creates risk of an accidental explosion.

(4) Where more than one blaster is involved in a blasting operation, an employer shall

- (a) before the commencement of the blasting operation, designate one blaster who shall have principal responsibility for the blast;
- (b) ensure that all persons in the blasting area are advised of the identity of the principal blaster; and
- (c) ensure that all blasters and supervisors performing or directing the work in a blasting area consult sufficiently to coordinate the safety of the activity.

(5) A person, other than a blaster, shall not

- (a) prime a charge;
- (b) make a connection which leads or which will lead from the explosive charge to a blasting machine, a blasting switch,

safety fuse or a shock tube initiating system including a NONEL;

(c) connect a delay or sequencing device or program the delay or sequence for the blast; or

(d) fire an explosive charge.

(6) An explosive charge shall not be fired until the blaster or principal blaster, if one is designated, has ensured that the placement of the charge and all other features of the blasting activity are adequate to ensure the safety of persons at or near the workplace.

Security and report
requirements

417. (1) Only a person authorized by the employer shall have access to the explosives.

(2) A theft or attempted theft of explosives shall be reported by the employer to the minister immediately upon becoming aware of the theft.

(3) An employer shall immediately notify and send written notice within 24 hours to the minister when a blasting accident occurs in which a personal injury is sustained or where there is an unusual occurrence in which explosives are involved, whether or not personal injury is sustained, together with the blaster's safety certificate of the blaster involved.

(4) A report referred to in subsection (3) shall contain

(a) the names and certificate numbers of all blasters involved;

(b) the names and occupations of any injured workers;

(c) the type of explosives, detonators and blasting machines used;

(d) a factual account of the events relating to the accident;

(e) date, time and location of the accident; and

(f) the action taken by the employer.

(5) The minister shall determine from the circumstances of the incident what action shall be taken, including whether the blaster's safety certificate required under subsection (3) may be returned to the blaster.

Examination

418. A thorough examination shall be made after charges have been fired and before drilling recommences to ascertain that no unexploded charges remain.

Records

419. (1) A log book or equivalent record shall be provided at the blasting site and the blaster in charge shall record the results of his or her examination on it.

(2) An employer shall ensure that a blaster keeps an updated log book or equivalent record.

(3) A blaster shall keep blasting records for 5 years following a blast, and shall keep his or her records available for inspection by an officer or employer at all reasonable times.

(4) An employer shall ensure that the employee in charge of explosive magazines maintains an inventory record, available to an officer, that records, for each magazine, the amount of detonators and other explosives stored in the magazine for at least the 3 previous years and a copy of the inventory record shall be kept at a place other than in the magazine.

(5) The inventory record referred to in subsection (4) shall include the following information:

- (a) for the detonators, the period, leg wire length and series; and
- (b) for other explosives, the type of explosives.

Suspension or
seizure of certificate

420. (1) If, in the opinion of the employer, the holder of a blaster's certificate has failed to comply with

- (a) a blasting requirement of these regulations;
- (b) the manufacturer's recommendations; or
- (c) recognized safe blasting practices,

the employer shall immediately investigate the incident and may suspend the blaster from performing the duties of a blaster.

(2) The employer shall submit a report of the investigation carried out under subsection (1) to the minister.

(3) The minister may seize a blaster's certificate if there is reason to believe that the safety of a person has been or may be endangered by the blaster and the seizure of the certificate shall continue until the minister determines the action to be taken.

Custody of certificates

421. A blaster shall

- (a) retain his or her blaster's safety certificate and keep it in a safe place at the workplace while carrying out his or her duties; and
- (b) upon the request of an officer, produce his or her blaster's safety certificate.

Day box or magazine

422. (1) A day box or magazine shall be licensed according to applicable legislation.

(2) A day box shall have explosives marked conspicuously on it where required by an officer.

(3) The ground within at least 10 metres of a magazine or day box shall be kept clear of long grass, brush and other readily combustible or flammable materials.

(4) A magazine or unattended day box containing a detonator shall not be placed within 50 metres of a magazine or day box containing another explosive except where an officer authorizes a lesser distance.

(5) A detonator shall not be placed in

- (a) a magazine or day box with other types of explosives; or
- (b) the same compartment of a vehicle as another explosive unless they are separated by use of a day box and unless there is compliance with all applicable legislation respecting the transportation of explosives.

(6) An explosive shall be attended at all times by a person authorized by the employer unless it is placed in a locked day box or locked magazine.

Prohibitions

423. (1) A person shall not smoke, and an open flame or article liable to spontaneously ignite or likely to cause an explosion or fire is not permitted within 10 metres of an explosive, magazine, day box or blasting area.

(2) Tools or other implements used to open containers of explosives shall be made of non-sparking material.

(3) A person shall not prime a charge in an area where explosives are stored.

(4) A person shall not carry an explosive in his or her clothing.

Storage and handling

424. (1) The handling and transport of explosives shall be conducted in accordance with the applicable provisions of the *Explosives Act* (Canada), the *Fire Prevention Act, 1991* and the *Dangerous Goods Transportation Act* and regulations under those Acts.

(2) Explosives shall be stored, handled and used in the manner recommended by the manufacturer.

Transportation

425. (1) A passenger, other than a person assigned to assist in handling explosives, shall not be permitted in a vehicle which is transporting explosives.

(2) A vehicle used to transport explosives shall be in sound mechanical condition, suitable for and capable of safely transporting explosives.

(3) Reasonable quantities of flammable or combustible materials may be carried by a conveyance transporting explosives provided that those materials are contained in a manner which will not cause or transmit fire in an explosion and are adequately separated from any explosives containers on the conveyance.

(4) Where equipment, including a drilling rig, is located in a blasting area, sufficient precautions, including ensuring adequate traction and stability, shall be taken to prevent toppling, sliding, or other unplanned movement of the equipment.

Drilling

426. (1) A drill hole shall be of a sufficient size to admit the free insertion of explosives to the bottom of the hole without ramming, pounding or undue pressure.

(2) Drilling shall not be done in a previously blasted area until the surface to be drilled is carefully examined for remnants of explosives or holes containing explosive materials.

(3) Where a remnant or a hole containing explosives is found, this explosive shall be dealt with as a misfire before drilling commences.

(4) Drilling shall not be done closer to any part of a hole containing an explosive than the distance equal to half the total depth of the hole being drilled and in no instance closer than 6 metres from any part of a hole containing an explosive.

(5) Notwithstanding subsection (4), where

- (a) a blaster determines that a particular misfire cannot be more safely treated by another means and it is necessary to drill an adjacent hole in a manner inconsistent with subsection (4);
- (b) the nature of the ground being drilled makes it necessary to load a hole immediately after it is drilled and to subsequently drill an adjacent hole in a manner inconsistent with subsection (4);
- (c) a loaded hole caves in and a blaster determines that the unexploded hole cannot be reprimed or otherwise more safely treated, and it is necessary to drill an adjacent hole in a manner inconsistent with subsection (4); or
- (d) it is necessary to use a drill to remove obstacles from a previously drilled hole which does not contain explosives and to do so would be inconsistent with subsection (4)

a written safe work procedure, developed in consultation with a blaster, may be followed where the employer has notified the director in writing that the safe work procedure is being implemented, including the reason for its implementation.

(6) The safe work procedure referred to in subsection (5) shall be authorized in writing by the minister prior to the commencement of the work.

(7) Where a safe work procedure referred to in subsection (5) is implemented, the details of the procedure and the reasons for its implementation shall be communicated to persons remaining in the blasting area who shall adhere strictly to its terms.

Handling in special
circumstances

427. (1) Explosives affected by cold temperatures shall only be used as recommended by the manufacturer.

(2) Waste and deteriorated, damaged or time-expired explosives shall be destroyed promptly by

(a) a blaster;

(b) a representative of the explosive manufacturer; or

(c) a qualified member of the Royal Canadian Mounted Police, the Department of National Defence, the Explosives Division of Natural Resources Canada or the Royal Newfoundland Constabulary using methods approved by the manufacturer.

Preparing the blast
loading

428. (1) A detonator shall be kept and handled separately from other types of explosives until the last practicable moment when the blaster primes the charge.

(2) A hole shall not be loaded with an explosive before it is necessary before firing.

(3) A nitroglycerine-based product shall not be unwrapped.

(4) A non nitroglycerine-based product shall remain in its original wrapping until the last practicable moment before use.

(5) An electric detonator shall be kept shunted or short circuited until it is used, except during the testing of the detonator.

(6) An employer shall ensure that tamping rods and other similar devices are made of wood or other non-sparking materials.

(7) Primed explosives shall not be slit or tamped.

(8) Undue pressure or pounding shall not occur during tamping.

(9) Where pneumatic loading of ammonium nitrate and fuel oil occurs, only a semi-conductive hose shall be used and the loader shall be effectively grounded and the bottom priming of drill holes shall be done with non-electrical initiation.

(10) A blaster, using a blasting meter, shall personally test the continuity of a loaded hole containing an electric detonator before the hole is stemmed with a suitable material.

(11) An explosive charge shall not be connected to another or by a means of initiation, including detonating cords, until the last practicable moment prior to firing.

Safety fuse

429. (1) Only a federally authorized safety fuse assembly shall be used and fuse capping is not permitted.

(2) A safety fuse assembly shorter than one metre shall not be used.

(3) Where it is necessary to fire more than one safety fuse assembly at a time, only one igniter cord or approved equivalent shall be lit.

Loaded holes

430. (1) The location of a loaded hole shall be visually identified by either placing individual markers at the hole or marking off the perimeter of the area containing loaded hole by a display of warning tape or other highly visible indicator.

(2) A hole which has been loaded, but not fired by the end of the working day, shall not be left unattended, whether primed or not.

(3) A worker shall be posted to ensure that a hole is not tampered with when the work crew is absent from the site.

(4) Security procedures shall be used to prevent access to a loaded hole by a person who has not been authorized by the blaster.

Restrictions

431. (1) A vehicle or other mechanical equipment shall not be driven or moved over an explosive, a blasting accessory or a hole containing an explosive.

(2) A blaster shall ensure that unused explosives and detonators are returned to the day box or magazine before the blast is initiated.

Electrical initiation

432. (1) Where there is danger from extraneous electricity, a blasting operation shall be fully non-electric.

(2) A blasting operation or handling of an explosive shall not be carried out on the approach of or during an electrical storm and persons shall remain outside the danger area at such time.

(3) To minimize hazards from radio frequency energy, electrical blasting shall not be carried out at a distance from a transfer less than shown in Table 1 or Table 2, as applicable:

Table 1

Recommended Safe Distances for Commercial AM Broadcast Transmitters

(frequency 0.535 to 1.605 megahertz)

Transmitter Power (watts)	Minimum Distance (metres)
Up to 4,000	228.60
5,000	259.08
10,00	396.24
25,000	609.60
50,000	853.44
100,000	1188.72
500,000	2682.24

Table 2

Recommended Safe Distances for Mobile Transmitters

Transmitter Power (watts)	Minimum distances (metres)				
	MF	MF	VHF	VHF	VHF
	1.6 - 3.4 MHz	28 - 29.7 MHz	35 - 35 42 - 44 50 - 54	144 - 148 150.8 - 16 MHz	450 - 460 MHz
10	12.9	30.48	12.19	4.57	3.05
50	27.43	67.06	27.43	10.67	6.10
100	38.10	94.49	39.62	15.24	9.14
180	-	-	-	19.81	12.19
250	60.96	149.35	62.48	22.86	13.72
500	-	-	88.39	-	-
600	91.44	231.65	96.01	35.05	21.34
1,000	121.02	298.70	124.97	45.72	27.43
10,000	381.00	-	396.24	-	-

(4) An employer shall ensure that during the commencement of a blasting operation and while it is in progress

- (a) if it is an electric blasting operation, a sign bearing the words "Blasting Operations, Turn Off Radio Transmitter" is posted on all public roads leading to a blasting area so as to be visible to persons entering the area; or

- (b) if it is a fully non-electric blasting operation, signs bearing the words "Blasting Operations" are posted on all public roads leading to a blasting area so as to be visible to persons entering the area; and
- (c) signs bearing the words "End of Blasting" are posted on all public roads leading from a blasting area so as to be visible to persons leaving the area.

(5) A sign required under subsection (4) shall have letters not less than 15 centimetres high on a contrasting background and shall be 90 centimetres wide and 120 centimetres tall.

(6) Where a sign referred to in this section is required to be visible to persons entering a blasting area, it shall be located at a distance from the blasting area of

- (a) 100 metres where the speed limit on the road is 50 kilometres an hour or less; or
- (b) 300 metres where the speed limit on the road is more than greater than 50 kilometres and hour. .

(7) An employer shall ensure that a sign required under this section is removed or covered when the blasting operation is completed.

(8) In addition to the other requirements of this section, the following precautions shall be adopted to reduce the potential hazards of electrical blasting near radio frequency energy sources:

- (a) mobile transmitters shall be kept away from the blasting area and where absolute control cannot be exercised, warning signs shall be posted to remind vehicle operators to turn off transmitters and, if necessary, flagmen shall be posted to instruct operators accordingly; and
- (b) blasting circuits shall be kept on the ground and bare connections shall be elevated sufficiently to prevent current leakage.

Pre-firing

433. (1) An electric blasting circuit shall be tested personally by a blaster with a blasting meter to ensure that readings are consistent with

the values calculated for the blast before the lead wire is connected to the blasting machine or blasting switch.

(2) The connection of the lead wires to the blasting machine or blasting switch shall be the last connection made before the blast.

(3) Only a blasting machine or blasting switch shall be used to fire an electric circuit.

(4) A blaster shall ensure that the capacity of the blasting machine as designated by the manufacturer is not exceeded.

(5) An employer shall ensure that a blasting machine is maintained in good working order and is inspected at least once every 12 months by a service representative authorized to work on the machine by its manufacturer or approved by the minister.

(6) Records verifying the condition of the blasting machine at the time of the annual inspection shall be kept by an employer until the next annual inspection.

Protection

434. (1) An employer shall take precautions to ensure that persons and property at or near the workplace are protected and that hazards of flying material, airblast, ground vibration or fumes from the blast are minimized.

(2) Where there is a danger to the safety of persons or property, a blasting mat of adequate size and strength or adequate cover shall be used or persons or property shall be moved to a safe location.

Firing

435. (1) A blasting machine shall not be used to fire an explosive charge unless it is designated and approved by the manufacturer for the sole purpose of energizing electric detonators.

(2) After blasting by electricity, a blaster shall not allow another person to enter a place where charges have been fired until he or she has

(a) disconnected the firing cables from the blasting machine;

(b) short-circuited the lead wires; and

- (c) personally examined the blasting area and given permission for work to proceed.

(3) A blasting meter shall not be used to take measurements pertinent to blasting unless it is approved and designed by the manufacturer for that sole purpose.

(4) Electric blasting circuits shall not be fired from a power transmission line unless a blasting operation is conducted in underground tunnelling and a blasting switch is used.

(5) A blasting switch shall not be used for firing electric blasting circuits from a power line unless it is approved and designed by the manufacturer as suitable for that purpose and constructed so that the door may be closed and locked with the switches in the "OFF" position.

(6) A blaster shall ensure that the blasting switch is kept locked and inaccessible until it is required to fire the explosive charge.

(7) Where an electrical power transmission line is present and electric blasting initiation is to be used, a cable used to fire the blast shall be anchored securely to avoid being thrown into contact with the power lines.

(8) An employer shall ensure that empty explosive cartons and boxes are

- (a) collected from the site before blasting; and

- (b) appropriately disposed after the blasting is completed.

(9) Before firing, a blaster shall ensure that

- (a) sufficient audible and visual warning is given to persons in or near the danger area;

- (b) roads and approaches to the danger area are guarded or barricaded in order to prevent anyone from entering;

- (c) machinery and equipment is clear of the effects of the blast; and

- (d) persons in the vicinity have moved to a safe distance.

Post-firing

436. (1) Immediately after firing electrically, a blaster shall disconnect and shunt or short circuit the lead wires from the blasting machine or the blasting switch and pull out and lock a blasting switch.

(2) After firing the blast, a blaster shall make a thorough inspection of the site, and after ascertaining that no unexploded charges remain, shall permit other employees to return to work or allow traffic to proceed.

(3) An employer shall ensure that loose rocks are scaled off the faces of excavations and removed from the crest after completion of the blasting operation and before work is resumed.

Unique blasting operation

437. (1) An employer shall ensure that, in addition to the requirements of these regulations, a safe work procedure is developed for the use and handling of explosives in the following circumstances:

- (a) in a confined space other than underground;
- (b) underwater;
- (c) for demolition of above-ground buildings, stacks, or other structures including beaver dams;
- (d) for ice control;
- (e) in theatrical applications where the special effects are explosives other than fireworks;
- (f) for oil and gas well control;
- (g) where black powder is used; or
- (h) at the request of an officer who concludes that a procedure involves an unusual use of explosives in the operation.

(2) In the case of a conflict between the safe work procedure referred to in subsection (1) and these regulations, these regulations shall apply.

Seismic blasting

438. (1) Where seismic blasting is carried out in an isolated location, loaded holes may be left unattended only if the blaster has first ensured that

- (a) leg wires are shunted together;
- (b) drill cuttings are spread out and levelled;
- (c) leg wires are coiled as close to the ground as possible while not exceeding 15 centimetres above the ground level; and
- (d) holes are suitably user identified, recorded in the blasting log and blasted within 30 days.

(2) In a seismic blasting operation the firing line may be left connected to the firing switch and disconnected at the hole where a recorder can confirm complete detonation.

(3) A misfired or unfired charge in a seismic blasting operation, may be left unfired only where

- (a) it cannot be conventionally and safely detonated;
- (b) it is in an isolated location and at least 6 metres deep; and
- (c) its location is effectively marked.

(4) A seismic water tank truck with open flame water heaters shall not be used to transport explosives unless

- (a) the distance between the heat tube and the outside of the tank is at least 35 centimetres;
- (b) the heater, if woodburning, has a fire box of a type that fully contains the fuel and 2 dampers mounted in the heat tube, one at the vent end and the other at the fire box, so the flame may be shut in instantaneously in the event of an accident;
- (c) the detonator storage is located on the opposite side of the vehicle from the explosive magazine and both are built to type 6 magazine standard; and
- (d) the requirements of subsections 428(11) and 429(1) and (2) are met.

(5) In a seismic operation where there is no alternate route, a vehicle may be driven over a loaded hole where

- (a) bypassing the hole is not practicable;
- (b) operational planning minimizes the requirement to travel through a loaded area;
- (c) safe work procedures are developed and communicated to workers before work is started;
- (d) loaded holes comply with subsection (1);
- (e) explosive charges are at a minimum depth of 6 metres;
- (f) radio transmission equipment is turned off or transmission capability is disabled by disconnecting the microphone; and
- (g) electrical equipment, including cellular phones and other types of mobile telephone equipment which continuously transmit a radio signal when turned on shall be turned off when driving over a loaded hole.

Misfire

439. (1) Where a charge has misfired or is suspected of having misfired, a person shall not move about the danger area until the expiry of the required waiting time in subsection (2).

(2) Where a charge has misfired or is suspected of having misfired, a blaster shall

- (a) where using a safety fuse, wait 30 minutes after the last charge was due to explode before entering the blasting area;
- (b) where using a means of initiation other than a safety fuse, wait 10 minutes after the last charge was due to explode before entering the blasting area;
- (c) where using an electric detonator, immediately disconnect the firing cable from the blasting machine or blasting switch and shunt the lead line

and at the end of the required waiting time, approach the misfired hole to assess the potential hazard.

(3) Where there is a misfire or a suspected misfire, a person shall not use metallic equipment in a blasting area until a blaster has

inspected the site and authorized the use of the equipment and the following procedure shall be used:

- (a) the site shall be fully illuminated;
- (b) the work shall be directly and constantly supervised by a blaster; and
- (c) precautions shall be taken to prevent injury from accidental explosion.

(4) An employer shall ensure that a misfire is treated at a safe and suitable time under the direction of a blaster so as to ensure the removal of hazards from the misfire in a manner that complies with these regulations.

(5) A blaster, in consultation with a supervisor, shall determine the safest and most practicable means of treating a misfire, either by reblasting or otherwise, and shall ensure compliance with these regulations.

(6) An employer shall, as far as practicable, ensure that the cause of a misfire is established and that corrective action is taken to prevent recurrence.

PART XX FIRE PREVENTION AND CONTROL

Fire protection

440. (1) The design and occupancy of structures and the provision of fire alarm and detection equipment and fire protection equipment, in places of employment, shall comply with the *Fire Prevention Act, 1991* and an employer shall ensure that work is carried out according to the applicable provisions of that Act and the National Fire Code.

(2) Fire alarm and detection equipment and fire protection equipment shall be maintained according to the manufacturer's instructions and any other requirements of provincial legislation.

(3) Workers shall be adequately instructed in fire prevention and emergency evacuation procedures applicable to their place of employment.

(4) A designated worker shall be adequately instructed in fire fighting procedures applicable to his or her place of employment.

(6) An employer that has

(a) controlled products as defined in the *Workplace Hazardous Materials Information System (WHMIS) Regulations*;

(b) explosives;

(c) pesticides;

(d) radioactive material;

(e) consumer products; or

(f) hazardous waste

in quantities which may endanger fire-fighters at a workplace shall ensure that the local fire department is notified of the nature and location of the hazardous materials or substances and methods to be used in their safe handling.

(7) Subsection (6) does not apply to a workplace:

(a) where materials are kept on site for less than 5 days, if the employer ensures that an alternate and effective means of notification of the fire department, appropriate to the hazard, is in place in the event of a fire or other emergency; or

(b) which is not within the service area of a fire department.

Fire and explosion

441. (1) Where a worker is employed in or about a bilge, tank, compartment or cargo space of marine equipment or in an area where there is a possibility of the presence of a volatile or flammable substance, gas or vapour, an employer shall institute a system of inspections and tests to determine the presence of that substance, gas or vapour before work is commenced.

(2) Where a volatile or flammable substance, gas or vapour is present or arises from the work process, the hazard shall be removed or controlled by ventilation or other effective means.

(3) Where work or manufacturing processes involve the use of a flammable liquid, vapour or gas, the concentration of the liquid, vapour or gas in the work area shall be maintained below the lower explosive limit (LEL) of the substance involved.

(4) A container used to carry, transfer, or store a flammable solvent shall meet the requirements of the CSA Standards and shall be electrically grounded or bonded while the contents are transferred from one container to another.

(5) Waste material contaminated with a solvent, oil, grease, paint or other flammable substance shall be placed in a covered metal containers before disposal and shall not be stored in work areas.

(6) Where a volatile or flammable substance, gas or vapour is present, or arises out of material or equipment or from a work process, existing or potential sources of ignition shall be controlled or eliminated

(7) For the purpose of subsection (6), a source of ignition includes, but is not limited to, an open flame, spark-producing mechanical equipment, welding and cutting processes, smoking, static discharge and an electrical equipment or installation that is not approved for hazardous locations, as specified by the Canadian Electrical Code.

(8) Where work involves more than one employer, a principal contractor shall ensure that sources of ignition resulting from the work of one employer are eliminated or adequately controlled in a work area where a flammable gas or a flammable liquid is handled, used or stored by another employer.

Trucks loading and
unloading

442. (1) A truck shall be electrically bonded and grounded when loading and unloading bulk petroleum products.

(2) A vehicle shall not be started or have its motor running in a loading area where a tank truck containing a flammable vaporizing liquid is being connected or disconnected.

(3) Where a tank truck is being loaded through a dome hatch and it is necessary to observe the fluid level,

(a) a platform shall be provided for the loader;

(b) shut-off controls shall be located at the platform; and

(c) approved illumination shall be provided during the hours of darkness.

Combustible substances

443. (1) Where a work process releases finely-divided combustible dust within an enclosed area where workers are employed, effective dust control equipment shall be used.

(2) A collector of combustible dusts, other than that of the liquid spray type, shall be

(a) located outside or in isolated enclosures removed from or protected against sources of ignition; and

(b) provided with explosion relief vents.

(3) Electrical wiring and equipment in a combustible dust collector and associated rooms or enclosures shall be of the explosion-proof type.

(4) Where combustible dust collects in a building, structure, machinery or equipment, it shall be removed before the accumulation of the dust creates a fire or explosion hazard.

Combustible gas propellants

444. Combustible gas or vapour shall not be used as a propellant for spray coatings.

Hot work

445. Fire suppression equipment shall be readily available and appropriate to the potential loss exposure at a location where hot work takes place.

PART XXI WELDING, BURNING AND CUTTING OPERATIONS

Gas welding and burning

446. (1) Welding, cutting, and similar processes shall be carried out according to the requirements of

(a) the current CSA Standard for welding safety in "Welding, Cutting and Allied Processes" or another standard acceptable standard acceptable to the minister;

(b) the manufacturer's instructions and recommendations for the equipment being used; and

(c) the applicable requirements of these regulations.

(2) Cylinders, piping and fittings of compressed and liquefied-gas systems shall be located or protected in a manner that prevents physical damage to them.

(3) A worker shall prevent a spark or flame from coming into contact with a cylinder, regulator or hose of a compressed-gas system and charged gas cylinders shall be protected from a source of heat in excess of 54.44°.

(4) Before gas-welding or burning equipment is put into use, a worker shall ensure that parts are free from defects, leaks or oil and grease and only standard fittings, designed and manufactured for the specific compressed gas service shall be used.

(5) A regulator or an automatic reducing valve of welding equipment shall only be used for the gas for which it was designed.

(6) A compressed gas cylinder

(a) shall be

(i) secured during storage, transportation or use, and

(ii) stored, transported and used only in accordance with the manufacturer's instructions, applicable CSA standards and applicable legislation; and

(b) shall not be hoisted by a slings, dropped or subjected to impact.

(7) A cylinder valve shall be closed and a hose drained when work is finished or when a cylinder is empty, and a valve protected cover shall be kept in position when a cylinder is not connected for use.

Oxygen

447. A worker shall not

(a) permit oil or grease to contact an oxygen cylinder, valve, regulator or other fitting; or

- (b) handle an oxygen cylinder or apparatus with oily or greasy hands or gloves.

Radiation protection

448. (1) Arc welding shall not be carried out unless a worker who may be exposed to radiation from the arc flash is protected by an adequate screen, curtain or partition or wears suitable eye protection.

(2) A screen, curtain or partition near an arc welding operation shall be made of or treated with a flame-resistant material or coating, and have a nonreflective surface finish.

Burning and welding

449. (1) Burning, welding or other hot work shall not be done in any area where there is a likelihood of the presence of flammable substances until

- (a) tests have been done to indicate that work may be safely performed; and
- (b) suitable procedures have been adopted to ensure that all existing or potential sources of ignition have been eliminated or effectively controlled.

(2) Where testing procedures are used, tests shall be conducted at intervals to ensure the continuing safety of workers.

(3) Burning, welding or cutting shall not be done where there is a danger of extreme heat coming into contact with a concrete surface unless that surface is protected from the source of heat.

(4) Suitable safety devices to prevent reverse gas flow and to arrest a flashback shall be installed according to the manufacturer's instructions on each hose in an oxygen system between the torch and the regulator.

Ventilation

450. Effective local exhaust ventilation shall be used at a fixed work station to minimize worker exposure to harmful air contaminants produced by welding, burning or soldering.

Coatings on metals

451. A coating on metal which could emit harmful contaminants, including such as lead, chromium, organic materials, or toxic combustion products shall be removed from the base metal, whenever practicable, prior to welding or cutting.

452. Receptacles for electrode stubs shall be provided and used.

Receptacles for
stubs.
Respiratory protec-
tion

453. Respiratory protective equipment shall be provided and worn where an effective means of natural, mechanical or local exhaust ventilation is not practicable.

PART XXII ACCESS AND EGRESS

Access, egress and
movement

454. (1) All workplaces shall have safe and appropriate means of access and egress.

(2) Work areas shall be arranged to allow the safe movement of workers, equipment and materials.

(3) An aisle or passageway designated for pedestrian traffic shall be clearly indicated by markings or other means and, where practicable, floor or grade markings shall be used.

(4) Practical means of emergency escape shall be provided from a work area in which work processes could create an immediate threat to workers, and where regular means of egress could be rendered dangerous or unusable.

(5) A walkway shall not be less than 50.80 centimetres wide and shall be accessible by means of a fixed ladder or stairway.

(6) A curb shall be installed on an elevated thoroughfare to prevent from running off the open edge of the thoroughfare.

Exits and doors

455. (1) An emergency exit shall be designed and marked to provide quick and unimpeded exit, and periodic emergency drills shall be held to ensure workers' awareness of the availability of the exits.

(2) A door shall not open directly onto a stairway, but shall open onto a floor or a landing having a width that exceeds the swing of the doors.

(3) A double-acting swing door shall be designed and installed to permit an adequate view through the door where the door presents a safety hazard.

(4) A transparent glass door or a glass panel that extends less than 30.48 centimetres from the floor and which could be mistaken for a doorway, shall be constructed of laminated, tempered or wired safety glass meeting the requirements of the National Building Code of Canada.

(5) Subsection (4) does not apply where the glass is fitted with bars, or other devices or markings which clearly indicate the presence and position of the door or panel.

Stairs

456. (1) A flight of stairs with more than 4 risers shall be equipped with handrails as follows:

- (a) on all open sides of stairway;
- (b) on one side of an enclosed stairway 1.12 metres or less in width; and
- (c) on both sides of enclosed stairways over 1.12 metres wide.

(2) The height of the upper surface of a stair rail from and perpendicular to the forward edge of the tread shall be not less than 91.44 centimetres and not more than 1.07 metres.

PART XXIII DIVING AND OTHER MARINE OPERATIONS

Definitions

457. In this Part,

- (a) "lifejacket" means a device that, when worn correctly, provides a specified buoyancy that will turn the wearer face-up on entering the water and keep him or her in this position;
- (b) "master" means a person in overall command of a commercial fishing vessel but does not include a pilot; and
- (c) "personal flotation device" means a device that, when worn correctly, provides a specified buoyancy to support a conscious person in an upright or backward leaning position, but is not designed to turn a person from a face-down to a face-up position in the water.

458. (1) Floors, platforms and decks of wharves and floating equipment shall be kept in good repair and free from hazards.

Wharves, platforms,
etc.

(2) Clear passageway shall be provided on a wharf deck in an area where lines may be handled.

(3) Curbs and bullrails shall be installed on open sides of floats, docks, wharves, piers and other areas where mobile equipment is used.

(4) Curbs or bullrails shall be of substantial construction and shall be a height of at least 25.40 centimetres above the deck level.

Ladders and gang
planks

459. (1) A dock, wharf or pier shall be provided with ladders regularly spaced at intervals not exceeding 30.5 metres about its perimeter and a ladders shall extend from the deck to at least 1 metre below water level.

(2) A fixed or portable ladder, gangplank or other safe means shall be provided and used as necessary to board and leave floating equipment.

(3) Portable means of access shall be secured as necessary to prevent dislodgement.

(4) A gangplank shall be provided with a guardrail in accordance with section 28, and where practicable, equipped with intermediate rails.

(5) The surface of a gangplank shall be provided with a means to prevent slipping.

Lifesaving equip-
ment

460. (1) Appropriate lifesaving equipment shall

(a) be provided and maintained for the rescue of a worker in danger of drowning; and

(b) be positioned at intervals not exceeding 50 metres in conspicuous locations as near as practicable to the danger area.

(2) A throwing line fitted to a lifebuoy or similar equipment shall be of suitable size and length and made of buoyant material.

(3) Lifesaving equipment shall meet the requirements of standards acceptable to the minister.

(4) A suitable boat shall be provided and kept ready for immediate use where a worker is employed in a situation where a boat is necessary for rescue or evacuation.

Floating work
platforms

461. (1) A floating work platform shall be designed by a professional engineer or other person acceptable to the minister.

(2) A floating work platform shall be used in such a manner that a worker is not endangered by instability or excessive movement of the equipment.

Personal flotation
devices

462. (1) Where a worker is employed under conditions which expose him or her to a risk of drowning, he or she shall wear a personal flotation device appropriate to the work environment and hazards.

(2) The personal flotation device referred to in subsection (1) shall be labelled and shall meet the requirements and standards of the Canadian General Standards Board.

(3) A personal flotation device or lifejacket is not required when a personal fall protection system, safety net or other satisfactory means is being used according to Part X.

Transporting work-
ers on water

463. The *Small Vessel Regulations* under the *Canada Shipping Act* (Canada) shall apply to a boat used to transport a worker.

Occupational diving
operations

464. (1) The following standards respecting diving operations, including amendments to them are adopted and constituted as part of these regulations:

- (a) CAN/SCA-Z275.4-02 "Competency Standard for Diving Operations"; and
- (b) CAN/SCA-Z275.2-04 "Occupational Safety Code for Diving Operations".

(2) Notwithstanding paragraph (1)(a), the following modifications to CAN/SCA-Z275.4-02 "Competency Standard for Diving Operations" apply to seafood harvesting and aquaculture diving operations:

(a) clause 7, SCUBA Supervisor (Restricted and Unrestricted) is struck and the following substituted:

(i) individuals who have successfully completed a five-day Surface Safety Attendant's course approved by the commission may supervise seafood harvesting and aquaculture diving operations.

Instruction

465. (1) Before the start of each fishing season, the master shall ensure that each crewmember is instructed in the operational characteristics of the fishing vessel including

- (a) the location and use of safety equipment, engine room components and controls;
- (b) deck equipment and rigging;
- (c) navigation equipment and electronic aids;
- (d) fishing equipment and its use, including safe work practices for each fishery the vessel will be engaged in;
- (e) procedures for anchoring the vessel;
- (f) the location and use of emergency equipment, including firefighting and radio equipment; and
- (g) escape routes in the event of fire.

(2) A master shall ensure as far as is reasonably practicable that the instruction required by subsection (1) results in each crewmember being able to apply the information as needed to protect his or her health and safety.

(3) A new crewmember joining the vessel shall be instructed in accordance with the requirements of this section at the time that he or she joins the vessel.

Vessel preparation

466. Before leaving on a voyage the master shall ensure that the fishing vessel is capable of safely making the passage, taking into account

- (a) the seaworthiness of the vessel;

- (b) the stowage and securing of all cargo, skiffs, equipment, fuel containers and supplies;
- (c) ballasting; and
- (d) present and forecast weather conditions.

Slipping and tripping hazards

467. (1) A work area on a vessel shall be kept

- (a) clear of unnecessary obstructions; and
- (b) free of slipping and tripping hazards.

(2) Decks shall have non-skid surfaces except in those locations where a smooth deck is required for handling fish.

(3) Tools and equipment shall be securely stowed when not in use.

Galley requirements

468. (1) A galley stove on a fishing vessel shall be fitted with rails or other means to restrain the movement of cooking utensils, and to prevent inadvertent contact by a crewmember.

(2) Stove fuel supply tanks and line

- (a) shall be fitted with a shutoff valve at the tank; and
- (b) shall not be located directly above the stove.

(3) Galley stoves shall

- (a) be secured to prevent movement; and
- (b) have sufficient clearance to permit the effective cleanup of oil and grease.

PART XXIV WOODWORKING AND WOOD PRODUCTS MANUFACTURING

Circular saws

469. (1) A circular saw having a rip-type tooth shall be provided with non-kickback fingers or dogs located so that they oppose the thrust or tendency of the saw to pick up the material or to throw it back and the

dogs shall be designed to provide adequate holding power for the thickness of the material being cut.

(2) A hand fed circular rip saw shall be equipped with a splitter or spreader designed so that material is prevented from binding on the saw blade and the saw withstands work stresses.

(3) A spreader referred to in subsection (2) shall be attached so that it remains in alignment with the saw, even when either the saw or table is tilted, and shall be placed so that the space between the spreader and the back of the saw when the largest blade is mounted in the machine does not exceed 1.27 centimetres.

(4) The use of a spreader or splitter in connection with grooving, dadoing or rabbeting is not required but on completion of these operations, the spreader or splitter shall be replaced immediately.

(5) A rip-saw shall be located so that a worker cannot work in line with the saw unless protected by a barrier to prevent him or her from being struck by material kicked back by the saw.

(6) A swing cut-off saw shall be provided with an effective device to return the saw automatically to the back of the table when released at a point of its travel and the functioning of the device shall not depend on a fibre rope, cord or spring.

(7) Where a counterweight is used on a swing cut-off saw, it shall be provided with a substantial safety chain or cable or shall be otherwise secured against falling wherever there is danger to a worker.

(8) A swing saw shall be provided with a limit chain, or other equally effective device to prevent the saw from swinging beyond the front of the table or beyond a forward position where the gullets of the lowest saw teeth will rise above the table top.

(9) A swing saw shall be prevented from rebounding by a latch or other effective device.

(10) A radial arm saw cutting table shall be of a width that no part of the saw blade overhangs the forward edge of the table, or a stop shall be installed to limit the forward travel of the saw to that effect.

(11) An operator of a swing cut-off saw shall take a position so that no part of his or her body is in line with the saw and an operating handle shall be on the side of the saw from which the material is fed and operated by the hand closest to the saw.

(12) A dull, badly set, improperly filed or improperly tensioned saw or an inserted-tooth saw with poorly fitting shanks or worn bits shall be immediately removed from service.

(13) A hand-fed tenoning machine shall have a device which holds the material being cut.

(14) A hand-held circular saw shall have a guard which automatically adjusts to the thickness of the material being cut, and which, when the saw is withdrawn from the material, completely covers the cutting area of the blade.

(15) An operator shall visually inspect a saw prior to use and a concern identified during the inspection shall be adequately addressed before the saw is used.

Operator protection

470. (1) Where material is manually fed to equipment which does not have a means to prevent worker's fingers entering the dangerous point of operation, a special hand tool shall be used.

(2) A template, jig, or pushstick shall be used where there is a risk of injury to a worker's hands when feeding woodworking machinery.

(3) Where the use of a guard on woodworking machinery is clearly impracticable for a specific operation, the guard may be removed, but an appropriate pushstick, jig, feather board or similar device shall be used to prevent the operator encroaching into the cutting area, and upon completion of the operation the guard shall be replaced.

(4) A guard may otherwise only be removed where the guard itself creates a hazard, or if its removal is necessary for maintenance.

(5) A machine requiring hand-fed or manual-fed operations shall be equipped with a device to hold the material being cut.

(6) Where a knife, saw, cutting head or other sharp-edged device is handled or transported, the cutting edge shall be guarded or other methods adopted to minimize the danger to a worker.

(7) Where loads of veneer are stacked in the vicinity of work areas or passage ways, they shall be rigidly supported and there shall be at least 3 spacing blocks between unit loads.

Cutting heads

471. (1) A hand-fed wood jointer with a horizontal head shall be equipped with a cylindrical cutting head.

(2) All knives and cutting-heads of woodworking machines shall be kept sharp, properly adjusted and firmly secured.

(3) Where 2 or more knives are used in one head, they shall be properly balanced.

(4) A cutting head on a woodworking tool or piece of equipment, including a router, shaper and sticker shall be

(a) properly adjusted and secured; and

(b) fitted with a protective hood that is sufficiently strong to contain flying metal fragments in the event that the cutting head components fail.

PART XXV FORESTRY OPERATIONS

Felling

472. (1) Snags or dangerous stubs which may interfere or create a hazard shall be cleared away before a tree is felled.

(2) A worker shall not work closer than 30.48 metres from another worker who is in the act of felling a tree unless he or she is assisting that person.

(3) When workers are strip-cutting and felling trees, they shall not work opposite each other or closer than 30.48 metres on adjacent strips unless an uncut strip is left between.

(4) Before the felling cut is started, a tree shall be under-cut in the direction it is to be felled.

- (5) When there is a lodged tree, an employer shall ensure that
- (a) the immediate area of the lodged tree is properly marked or flagged to alert another of the hazard;
 - (b) the tree is felled as soon as possible using appropriate equipment;
 - (c) the tree is not climbed by a worker; and
 - (d) the tree is not lowered by felling another tree onto the lodged tree or by cutting a supporting tree.
- (6) An employer or contractor shall ensure that no worker, other than the worker who is felling a lodged tree, enters the felling area unless it is safe to do so.
- (7) A worker shall not stand on a tree or log when de-limbing it.
- (8) Once a felling cut has been started on a tree, a worker shall not leave the tree to carry on other work until felling has been completed.
- (9) A decayed or partially decayed tree or stub shall not be used as a block tree.
- (10) A decayed or partially decayed tree or stub which constitutes a hazard at a yard or bucking and piling area shall be felled before the site is used.
- (11) A choker cable, twitching chain or dog shall be released and pulled away from the log or tree before it is slashed, bucked or measured.
- (12) An axe shall not be used to cut wire rope.
- (13) A skidder's winch shall only be operated from the seat unless remote controls are used or the worker is letting out cable.

Power saws

473. (1) A chain saw shall be maintained according to the CSA standard for "Chain Saws" and shall be equipped with a safety chain and chain brake.

(2) A container used for storing or transporting gasoline products shall meet the requirements the CSA standard for "Portable Containers for Gasoline and other Petroleum Fuels".

474. (1) A truck, trailer or semitrailer used for transporting logs shall be equipped with bunks and stakes of adequate design and construction to safely perform their intended function.

(2) A stake referred to in subsection (1) shall be constructed so that keeper pins are secured against unintended release.

(3) A worker shall not ride on logs, pulpwood or other material loaded on or drawn by a motor vehicle while it is in transit.

(4) A road, bridge, elevated platform or other structure used by a vehicle transporting workers, logs or other forest products in forestry operations shall be constructed and maintained to a standard which will permit safe transit.

(5) The open sides of a bridge, elevated truck weigh scale and associated elevated ramp approach, and other elevated structures used by logging trucks shall be equipped with substantial and well secured continuous timber or log curbs or bull rails to prevent vehicles from running off the structure that are of sufficient height and in any event not less than 25 centimetres high.

PART XXVI ELECTRICAL OPERATIONS

Definitions

475. (1) In this Part,

- (a) "conductor" means a wire, cable or other metal component installed for the purpose of conveying electric current from one piece of equipment to another or to ground;
- (b) "control system" means a manual, remote, automatic or partially automatic system for controlling the operation of equipment;
- (c) "electrical equipment" includes machinery, a plant, works, wires, pipes, poles, conduits, apparatus, appliances and equipment, designed or used or intended for use for or in

connection with the generation, transmission, supply, distribution or use of electrical energy for any purpose;

- (d) "high voltage" means a potential difference (voltage) of more than 750 volts between conductors or between a conductor and ground;
- (e) "isolated" means that normal sources of energy have been disconnected by opening and securing all associated switches, and that mechanical equipment has been rendered and secured non-operative by disconnecting, stopping, depressurizing, draining, venting or other effective means;
- (f) "low voltage" means a potential difference (voltage) from 31 to 750 volts inclusive, between conductors or between a conductor and ground;
- (g) "power system" means a plant and equipment essential to the generation, transmission or distribution of electricity, including a plant or equipment that is out of service, being constructed or being installed; and
- (h) "safety protection guarantee" means an assurance that a power system or part of the power system is isolated and will remain isolated.

Electrical requirements

476. (1) An electrical installation, equipment, apparatus and appliance shall conform to the requirements of the Canadian Electrical Code as adopted in the *Electrical Regulations* under the *Public Safety Act*.

(2) Only a worker qualified to work on electrical conductors and equipment shall be authorized to do the work.

(3) The maximum voltage permitted for the use of rubber gloves, shields and other necessary safety equipment while working on energized electrical conductors shall be 3000 volts to ground.

(4) Work shall not be done on an energized electrical conductor or equipment that has a voltage of more than 750 volts unless 2 or more workers are present while the work is being performed.

Poles and structures

477. Before a worker climbs or is supported by a pole or structure, or before any work is done that will affect its stability

- (a) the pole or structure shall be tested for soundness and stability; and
- (b) where there is any doubt as to soundness or stability, the pole or structure shall be effectively supported before wires or cables are changed, and the supports shall be left in place until workers are clear of the pole or structure.

Service rooms

478. Where practicable, a service room or electrical vault shall be used only for the purpose for which it was intended.

Space around
equipment

479. (1) Passageways and working space around electrical equipment

- (a) shall be kept clear of obstructions and arranged so as to give authorized persons ready access to all parts requiring attention; and
- (b) shall not be used for storage.

(2) Flammable material shall not be stored or placed close to electrical equipment.

(3) A worker shall not use oil-base paint or other volatile flammable substance in an electrical substation or confined area where high voltage electrical current passes through.

Testing equipment

480. (1) Electrical equipment may be used if it meets the requirements of

- (a) CSA Standard C22.2 No. 160-M1985 (Reaffirmed 1992), "Voltage and Polarity Testers"; or
- (b) CSA Standard CAN/CSA-22.2 No. 231 Series-M89, CSA "Safety Requirements for Electrical and Electronic Measuring and Test Equipment".

(2) Appropriate safe work procedures shall be established and followed for testing electrical equipment and circuits.

Power line hazards

481. Where there is a potential for hazard, a person shall not operate a mobile crane, boom truck or similar equipment without first having completed a safety training program about power line hazards as required by the minister.

482. (1) Low voltage electrical equipment shall be completely disconnected and locked out as required by Part IX before work is started on it.

Low voltage electrical equipment - disconnection and lockout

(2) Where it is not practicable to completely disconnect low voltage electrical equipment, work shall be performed in accordance with written safe work procedures that

- (a) require the use of appropriate electrical protective equipment, including rubber gloves and cover up and other necessary live line tools;
- (b) provide that, where practicable, uncontrolled liquid is not permitted close to a worker working on the equipment; and
- (c) where applicable, control the use of metal ladders, wooden ladders with wire reinforced side rails, metal scaffolds or metal work platforms.

Low voltage electrical equipment

483. Prior to completing installation and after energizing low voltage electrical equipment, conspicuous signs visible to a worker shall be placed close to the equipment stating "Danger, Energized Equipment".

Working close to low voltage energized equipment

484. (1) Uninsulated, energized parts of low voltage electrical equipment shall be guarded by approved cabinets or enclosures unless the energized parts are in a suitable room or similar enclosed area that is accessible only by qualified persons.

(2) An entrance to a room or other guarded location containing uninsulated and exposed energized parts shall be marked with a conspicuous warning sign limiting entry.

(3) Where uninsulated energized parts are not guarded with approved cabinets or enclosures

- (a) a suitable barrier or cover shall be provided where a worker unfamiliar with the hazards is working within one metre of the uninsulated, energized parts; or
- (b) a worker shall be informed of the potential hazards and provided with and follow appropriate written safe work procedures.

485. An electrical distribution switch, circuit breaker and control shall be clearly marked to indicate the equipment it serves.

Low voltage electrical equipment - controls
Grounding portable low voltage electrical equipment

486. (1) Portable electrical equipment having double insulation or equivalent protection and so marked, is not required to be grounded.

(2) Portable electrical equipment, required to be grounded and not permanently connected to the wiring system, shall be effectively grounded by the use of approved cords and polarized plugs inserted in grounded polarized receptacles.

Low voltage electrical equipment - ground fault interrupters

487. (1) When used outdoors or in a wet or damp location, portable electrical equipment shall be protected by an approved ground fault circuit interrupter.

(2) A ground fault circuit interrupter shall not be used as a substitute for grounding.

Isolation and lock-out

488. (1) High voltage electrical equipment shall, where practicable, be completely isolated, grounded and locked out as required by these regulations before work is started on it.

(2) Where it is not practicable to completely isolate high voltage electrical equipment

- (a) written safe work procedures shall be followed;
- (b) 2 or more qualified persons shall be present while the work is being done;
- (c) appropriate electrical protective equipment, including rubber blankets, hoses, hoods, gloves and live line tools shall be selected, used, stored, tested and maintained in accordance with a standard acceptable to the minister;
- (d) the maximum voltage permitted for the use the electrical protective equipment referred to in paragraph (c) shall be 3000 volts to ground; and
- (e) a worker shall not work on an energized electrical conductor or equipment operating at more than 3000 volts, unless procedures satisfactory to the minister are used or the worker is

provided with and trained in the use of special tools, approved for use by an authority acceptable to the minister.

Warning signs

489. Prior to completing installation and after energizing high voltage electrical equipment, conspicuous signs visible to a worker shall be placed close to the equipment stating "Danger, Energized Equipment".

De-energized high voltage systems - isolation and lock-out

490. (1) Prior to working on a high voltage power system that, for reasons of safety, must be de-energized, the worker in charge shall ensure that the part of the system being worked on is isolated and grounded and locked out as required by these regulations.

(2) A barrier or other form of distinctive identification shall be used to differentiate high voltage electrical equipment which has been de-energized for safety reasons from similar energized equipment at the work location where a lack of identification would result in undue risk to workers.

(3) Where it is impracticable to lock out a power system or part of a power system,

- (a) the boundaries of the power system or part shall be clearly defined;
- (b) written work procedures respecting safety protection guarantees and complying with the requirements of sections 491 to 495 shall be followed; and
- (c) major equipment used to establish safety protection guarantees shall be uniquely identified at a conspicuous place on or near the equipment.

Person in charge

491. (1) Only one person at a time shall be assigned as the person in charge with the exclusive authority to establish the conditions for, and to issue safety protection guarantees for, the power system or part of it.

(2) The person in charge referred to in subsection (1) shall

- (a) ensure that the status of the power system or assigned part of the power system is accurately represented on a mimic display;

(b) maintain a log of switching details, safety protection guarantees and operational events; and

(c) authorize the commencement of work on the power system or assigned part of it.

(3) There shall be an effective communication system between the person in charge and a workers doing the work.

(4) Only a worker specifically authorized by an owner may receive a safety protection guarantee or do work on the power system or assigned part of the power system.

Switching sequences

492. Where a switching sequence requires the operation of 3 or more devices, a written switching order shall be prepared and followed.

Isolating devices

493. (1) An isolating device used as a safety protection guarantee shall provide for visual verification of the opening of an isolation point.

(2) A lockable isolating device shall be locked in the position or condition required to protect a worker before work commences under a safety protection guarantee.

(3) A distinctive "DO NOT OPERATE" tag shall be placed securely on an isolating device used for a safety protection guarantee.

Grounding and blocking

494. (1) While a safety protection guarantee is in effect, the equipment to be worked on shall be tested to verify isolation before grounding and blocking begin.

(2) After the testing referred to in subsection (1) has been done, the person at the worksite responsible for a crew shall verify that the required grounding and blocking devices are in place before work begins.

(3) Grounding and blocking of equipment that may be hazardous to workers shall be carried out as close as practicable to the worksite.

(4) Where grounding and blocking is not safe or practicable, written safe work procedures acceptable to the minister shall be followed.

(5) Grounding and blocking devices may be removed for the purpose of conducting tests after lockout procedures have been followed.

Multiple authorities

495. Where a safety protection guarantee involves 2 or more power systems or 2 or more persons in charge of different parts of a system, appropriate written procedures shall be established and followed to ensure that the safety protection guarantee will be effective.

Minimum clearance
- high voltage
equipment and
conductors

496. (1) An employer shall ensure that at least the minimum applicable distance specified in the following table is maintained between exposed, energized high voltage electrical equipment and conductors and any worker, work, tool, machine, equipment or material, except as otherwise permitted by this Part:

Voltage Phase to Phase	Minimum Distance
Over 750 V to 75 kV	3 metres
Over 75k V to 250 kV	4.5 metres
Over 250 kV to 550 kV	6 metres

(2) An employer shall accurately determine the voltage of energized electrical equipment or conductor and the minimum distance from it required under subsection (1).

Assurance in writing

497. (1) Where the minimum distance set out in subsection 496(1) cannot be maintained because of the circumstances of work or the inadvertent movement of persons or equipment, an assurance in writing on a form acceptable to the minister and signed by a representative of the owner of the power system, shall be obtained.

(2) An assurance under subsection (1) shall state that while the work is being done, electrical equipment and conductors will be displaced or rerouted from the work area, where practicable.

(3) Where compliance with subsection (2) is not practicable, an assurance under subsection (1) shall state that the electrical equipment will be isolated and grounded, but where isolation and grounding is not practicable, the assurance shall state that the electrical equipment will be visually identified and guarded.

(4) Safeguards specified in an assurance under subsection (1) shall be in place before work commences and shall be effectively maintained while work is taking place.

(5) Where guarding is used,

(a) neither equipment nor unqualified persons shall touch the guarding; and

(b) a safety watch shall be designated, or range limiting or field detection devices acceptable to the minister shall be used.

(6) An assurance under subsection (1) shall be available for inspection at the workplace, as close as practicable to the area of work and shall be made known to all persons with access to the area..

Assurance not
practicable

498. (1) Where exposed high voltage electrical equipment and conductors cannot be isolated, rerouted or guarded, work shall not be done within the minimum distance specified under subsection 496(1) until approval is obtained from the minister and the following precautions are taken:

(a) the area within which equipment or materials are to be used shall be barricaded and supervised to restrict entry only to those workers necessarily engaged in the work;

(b) a safety watcher shall be designated; and

(c) a positive means shall be provided for the safety watcher to give a clear, understandable stop signal to workers in the area, and watcher shall not give the stop signal by any other means.

(2) While equipment is in motion in an area in proximity to energized electrical equipment or conductors, a person other than the equipment operator shall not touch any part of the equipment or the material being moved by it.

(3) A person shall not move a load or rigging line from its position of natural suspension where the load or rigging line is in proximity to an energized electrical conductor or equipment.

499. (1) Sections 495 to 498 do not apply to an emergency action close to energized high voltage electrical equipment or conductors that is carried out by a worker who has undergone a course of instruction approved by the minister.

(2) During an emergency action referred to in subsection (1), every reasonable precaution shall be taken to control hazards, including, where practicable,

- (a) restricting entry into the area within which equipment or materials are to be moved to a worker necessarily engaged in the work;
- (b) designating a safety watcher;
- (c) where equipment is in motion, preventing a person other than the equipment operator from touching any part of the equipment or the material being moved by it; and
- (d) requiring an equipment operator to operate the controls from
 - (i) the seat provided on the equipment;
 - (ii) a metal stand that is integral with the frame of the equipment and clear of the ground; or
 - (iii) a metallic mat bonded to the frame of the machine and located on the ground beside the machine.

Authorization by owner

500. A qualified worker may work within the minimum distances to energized high voltage electrical equipment and conductors specified in subsection 496(1) provided that the worker is authorized by the owner of the power system and uses work procedures acceptable to the minister.

Tree pruning etc. - preliminary inspection

501. Prior to commencing tree pruning or felling close to energized high voltage overhead conductors, the worksite shall be inspected by a qualified person, authorized by the owner of the power system, to identify a hazard, including situations where a part of the tree to be pruned or felled is within the applicable minimum distance from an energized conductor specified in subsection 496(1) or may fall within that distance.

502. Tree pruning or falling shall not commence in a hazardous area until

Tree pruning etc. in hazardous area

- (a) an assurance is issued by the owner of the power system that any reclose feature is disabled; and
- (b) a worker is informed of the voltages of the conductors.

Qualifications

503. (1) Tree pruning or falling within the minimum distances specified in subsection 496(1) from overhead energized high voltage conductors shall be carried out by a qualified worker who has been authorized by the owner of the power system to perform the work.

(2) Tree pruning or falling is not permitted within the minimum distances specified in subsection 496(1) from overhead high voltage energized conductors unless

- (a) a qualified worker is present at the site and directing the work; and
- (b) at least one additional person, trained in appropriate emergency rescue procedures, is present.

Control systems - general requirements

504. (1) A control system shall be designed, installed, operated and maintained by a qualified person in accordance with a standard acceptable to the minister.

(2) Where practicable and required to minimize risk to workers, a control system shall be designed so that

- (a) the controlled equipment cannot be inadvertently activated;
- (b) an effective basic diagnostic capability is incorporated;
- (c) hardwired emergency stop devices are provided at operator stations; and
- (d) operator controls other than emergency stop devices can be activated at only one station at a time.

(3) A control system shall be used to prevent automatic startup after a power interruption or low voltage occurrence where automatic startup in such circumstances is likely to create a hazard to workers.

(4) A control system shall be designed, where practicable, so that the controlled equipment does not create a hazard to workers where the system fails or is shut down.

(5) Equipment operated by a new or altered control system shall not be used until the control system has been thoroughly checked and tested to verify that it will function in the intended manner.

(6) An employer shall ensure that there is up-to-date documentation that is readily available to an affected worker that describes the design, installation, operation and maintenance of a control system.

(7) Control system hardware shall be protected from circumstances that could adversely affect the performance of the system, including mechanical damage, vibration, extreme temperatures or humidity level, high electromagnetic field levels and power disturbances.

(8) Written safe work procedures shall be developed for the use of equipment operated by a control system, including lockout procedures as required by these regulations.

Programmable
control systems

505. (1) Documentation provided for a programmable control system shall include a copy of the control program that will allow the equipment to be reprogrammed where necessary to ensure the safe operation of the system.

(2) Only a qualified person may have access to the installed control system software.

Automatic control
systems

506. Where practicable and required to prevent a hazard to workers, a control system shall be designed so that during an automatic sequence

- (a) an operator may make an emergency stop of the controlled equipment;
- (b) an operator may, if safe, be allowed manual control of the equipment; and
- (c) the sequence will abort where a protective timer completes its assigned time without an expected event occurring.

Remote control
systems

507. (1) The maximum distance from which an operator may control equipment operated by a remote control system shall be specified by the manufacturer.

- (2) Written safe procedures shall be established that
 - (a) specify the maximum distance from which the operator is allowed to remotely control the equipment; and
 - (b) ensure that a worker remains at a safe distance from remotely controlled moving parts and any remotely controlled mobile machine.

Wireless remote
control

508. A wireless remote control system shall incorporate

- (a) error checking to prevent the controlled equipment from responding to corrupt data; and
- (b) identification coding methods to prevent a transmitter other than the designated transmitter from operating the equipment.

PART XXVII CONFINED SPACE ENTRY

Confined space
entry

509. (1) An employer shall perform an assessment of the work area to determine whether it contains a confined space.

(2) An employer shall inform a worker who may have to work in a confined space of a hazard by posting signs or other equally effective means of advising of the existence of and dangers posed by confined spaces.

(3) For the purpose of this part, "confined space" means an enclosed or partially enclosed space that.

- (a) is not designed or intended for human occupancy except for the purpose of performing work;
- (b) has restricted means of access and egress; and
- (c) may become hazardous to a person entering it as a result of

- (i) its design, construction, location or atmosphere,
- (ii) the materials or substances in it, or
- (iii) any other conditions relating to it.

Corrective precautions

510. (1) An employer shall ensure that a worker does not enter a confined space in which a harmful atmosphere exists or may develop until

- (a) a pipeline containing a hazardous substance leading to the confined space is safely and completely blocked off or disconnected;
- (b) a test required under subsection (2) has been completed;
- (c) the worker has been trained by the employer to safely enter and perform duties within the confined space;
- (d) a written work permit documenting the tests and safety precautions has been completed; and
- (e) a set of written safe work procedures has been developed and a worker has been instructed in these procedures.

(2) Appropriate tests for harmful vapours, gasses, fumes, mists, dusts or explosive substances and oxygen deficiency shall be made and recorded

- (a) prior to entry into the confined space;
- (b) after an interruption in the work procedures; and
- (c) at appropriate intervals.

(3) Where a test made under subsection (2) indicates an unsafe condition, the confined space shall be ventilated or cleaned or both and periodically retested to ensure that:

- (a) the oxygen content is between 20% and 22%;
- (b) the concentration of flammable substances is maintained below 10% of the lower explosive limit (LEL) of that substance or substances; and

(c) a worker's exposure to harmful substances is maintained at acceptable levels in accordance the TLVs established by ACGIH.

(4) Where a test under subsection (2) indicates the presence of a harmful or explosive substance and it is not feasible to provide a safe respirable atmosphere, an employer shall ensure that

(a) a worker entering the confined space is provided with and wears respiratory and personal protective equipment appropriate to the hazards likely to be encountered; and

(b) where a flammable or explosive gas or liquid is present all sources of ignition are controlled or eliminated.

(5) Tests made under in subsection (2) shall be performed by a person who has been adequately trained in the proper use of testing and monitoring equipment.

(6) The completed permit referred to in paragraph (1)(d) shall be made available at the time of entry to all authorized personnel by posting it at the entry portal or by any other effective means.

Work procedures

511. (1) An employer shall ensure that a worker who is required or permitted to enter a confined space in which a harmful atmosphere exists or may develop or where he or she may become entrapped by material

(a) wears appropriate retrieval equipment which would keep the worker in a position to be rescued; and

(b) has a life-line attached to the retrieval equipment which is tended at all times by a person, stationed outside the entrance to the confined space who shall be equipped for and capable of effecting rescue

and the employer shall prevent entanglement of life-lines and other equipment where one or more workers enter the confined space.

(2) Notwithstanding subsection (1), the use of a lifeline is not required where an obstruction or other condition makes its use impractical or unsafe but in such a case an employer shall implement procedures to ensure the safety of the worker.

(3) An employer shall ensure that a worker entering a confined space is

- (a) attended by a person stationed at or near the entrance who has been trained in emergency response;
- (b) provided with a means of continuous communication with the person referred to in paragraph (a); and
- (c) checked visually or by other effective means by a designated person at intervals as often as may be required by the nature of the work being performed.

(4) The person referred to in subsection (3) shall have a suitable means for summoning assistance.

Entry into confined space

512. A confined space shall be entered only where

- (a) the opening for entry and exit is sufficient to allow safe passage of a person wearing personal protective equipment;
- (b) mechanical equipment in the confined space is
 - (i) disconnected from its power source, and
 - (ii) locked out and tagged;
- (c) pipes and other supply lines whose contents are likely to create a hazard are blanked off;
- (d) measures have been taken to ensure that, where appropriate, the confined space will be continuously ventilated;
- (e) liquid in which a person may drown or any free-flowing solid in which a person may become entrapped has been removed from the confined space;
- (f) adequate explosion-proof illumination is provided as appropriate; and
- (g) adequate barriers are erected to prohibit unauthorized entry.

513. An employer shall ensure that emergency rescue procedures are established and followed where workers are trained in the event of an accident or other emergency in or near the confined space, including immediate evacuation of the confined space.

**PART XXVIII
REPEAL AND COMMENCEMENT**

CNLR 1165/96
repealed

514. The *Occupational Health and Safety Regulations, Consolidated Newfoundland and Labrador Regulations 1165/96*, are repealed.

Commencement

515. These regulations shall come into force on (date to be determined).

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