Issued consequential to January 1, 2018 Regulatory Amendment

Regulatory excerpt
Sections 4.43.1(1), (2), (4) and (8) of the *OHS Regulation* ("*Regulation*") state:

> (1) In this section, "*storage rack*" means a combination of steel frames, beams and associated accessories used, once assembled into a structure, to support materials and products, including, for example, a pallet rack or cantilever rack, but excludes shelving and display fixtures used for retail purposes.
>
> (2) This section applies in respect of a storage rack that is
>
> (a) 2.4 m (8 ft) or taller in height, as measured from the floor to the top of the highest shelf level of the storage rack, or
>
> (b) under 2.4 m (8 ft) in height, if the materials and products are loaded on or unloaded off the storage rack by other than manual means.
>
> …
>
> (4) The employer must ensure that a qualified person installs and uninstalls the storage rack, in whole or in part, in accordance with the instructions of the manufacturer or a professional engineer.
>
> …
>
> (8) The employer must ensure that a qualified person
>
> (a) inspects the storage rack
>
> (i) for wear, corrosion, damage, missing or incompatible parts, and signs of fatigue, and
>
> (ii) at regular intervals that will prevent the development of unsafe working conditions,
>
> (b) makes a record of the results of each inspection, and
>
> (c) provides the record to the employer.
>
> …

Purpose of guideline
The purpose of this guideline is to:

- Clarify the application of section 4.43.1 of the *Regulation* to storage racks
- Provide direction to employers on how to meet their obligations in ensuring that qualified persons install, uninstall, and inspect storage racks
- Provide guidance on the frequency of storage rack inspections

Application of section 4.43.1 â€“ Types of storage racks
Steel storage racks are universal equipment found in many workplaces. In most workplaces, they are loaded and unloaded with powered mobile equipment. Due to the common use of the phrase "storage racks" that describes all types of storage systems, as well as shelving units, this guideline provides further clarification and examples of the types of storage rack to which section 4.43.1 is intended to apply.

Section 4.43.1(1) defines a "storage rack" as a combination of steel frames, beams, and associated accessories used, once assembled into a structure, to support materials and products, including, for example, a pallet rack or cantilever rack, but excludes shelving and display fixtures used for retail purposes. The requirements of section 4.43.1 apply to the most common industrial storage racks, called "pallet racks," where palletized loads are placed on engineered steel framework of beams, columns, and bracings, designed to meet a certain rated capacity.

Other examples of steel storage racks to which section 4.43.1 applies include the following:

- Cantilever racks
- Double-deep racks
- Push-back racks
- Drive-in racks or drive-through racks
- Other similar types of industrial racks

Section 4.43.1(2) further narrows the scope of section 4.43.1 to apply to steel storage racks as described above where either of the following exists:

- It is 8 feet (2.4 m) or taller in height, as measured from the floor to the top of the highest shelf level of the storage rack
- It is under 8 feet (2.4 m) if the materials and products are loaded and unloaded off the storage rack by other than manual means (for example, using a forklift or automated mechanical system)

Steel storage racks that are designed to be shelving and display fixtures for retail purposes are excluded from the scope of section 4.43.1.

If a "steel storage rack" is not considered to be any of the above types, it is probably not the type of storage rack covered by this section. However, other sections of the *Regulation*, such as sections 4.2, 4.3, 4.8, and 4.43, would continue to apply to other types of storage racks, shelving, and fixtures to ensure worker safety.

Competencies of a qualified person
The term "qualified" is defined in section 1.1 of the *Regulation* as 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.

Employers are responsible for ensuring that the qualified person can competently perform required tasks. When determining competency, the employer should assess the person's knowledge, skills, and abilities. Some competencies require the person to have *knowledge of*, which means the person is able to explain a process, procedure, or has underpinning knowledge. Competencies which have the *ability to* require the person to demonstrate the application of a process or procedure.

If the person is unable to demonstrate certain competencies, the employer should develop a plan to address any gaps in the person's knowledge, skills, or abilities, or consider hiring someone with the necessary competencies, like a qualified rack installer.

Although the same term, "qualified person," is used for sections 4.43.1(4) and 4.43.1(8), the qualified persons in these two roles likely possess a very different level of technical competencies.

(a) Qualified person referred to in section 4.43.1(4) for installation/uninstallation

Steel storage racks are engineered structures constructed by a network of frames, beams, and bracings designed to withstand specified loads. Proper installation and uninstallation of racks are critical for the safety of workers around racks. If installed incorrectly, racks could have catastrophic consequences. Similarly, if a rack is dissembled incorrectly, it could collapse prematurely and endanger workers.

Qualified persons are able to install or uninstall storage racks in accordance with the instructions of the manufacturer or a professional engineer because they are knowledgeable in installing/uninstalling storage racks, they understand the hazards involved with this task, and know how to control the hazards.

All of the competencies listed may not apply to a qualified person performing a partial install/uninstall needed for repairs or reconfiguring storage racks. The competencies of a qualified person need to be consistent with the specific task being performed.

General knowledge and abilities for a qualified person for the purposes of installation and uninstallation of storage racks include the following:

Knowledge of

- When to refer to a professional engineer and/or manufacturer
- Applicable legislative obligations (i.e., permits; electrical, building [seismic], and fire codes)
- How to identify a start point from engineering drawings, if applicable
- Requirements to participate in location specific orientation (i.e., employer of the rack site)
- Hazards that are specific to the storage rack type
- Hazards involved with the install/uninstall activity
- How to assess existing storage racks for compatibility
- When special or additional temporary support is required to safely install or uninstall
- When additional assistance is required for installation/uninstallation
- How to confirm compatibility within storage rack systems

Ability to

- Review layout drawings to support install/uninstall processes
- Review site specific procedures to support install/uninstall processes
- Use the materials list to confirm adequate storage rack components for installation
- Conduct a visual inspection of storage racks
- Take appropriate measurements as needed
- Stand and install storage racks
- Square the storage rack system
- Inspect and assess anchors
- Apply order of assembly and disassembly
- Conduct a final inspection
- Disassemble storage racks
- Determine lean and deflection
- Operate mobile equipment and work platforms, if required
- Select and use appropriate tools and equipment to install or uninstall storage racks
- Determine if the use of mobile equipment and work platforms is required for the purposes of installation/uninstallation

(b) Qualified person referred to in section 4.43.1(8) for inspection of storage racks

Steel storage racks, like other industrial equipment, endure "wear and tear" with use. Also, storage racks are often damaged by mobile equipment that moves items to and from the storage racks.

Section 4.43.1(8) states that employers must ensure that inspections of the storage rack are conducted by a qualified person for wear, corrosion, damage, missing or incompatible parts, and signs of fatigue, and at regular intervals that will prevent the development of unsafe working conditions.

General knowledge and abilities for a qualified person for the purposes of a routine inspection of storage racks include the following:

Knowledge of

- Hazards associated with products or loads
- When to escalate to an expert, such as a professional engineer or the manufacturer
- Appropriate load based on the storage rack system
- When the load should be removed

Ability to

- Determine scope and purpose of inspections
- Review past inspection reports to support inspection processes
- Apply safe operating procedures for storage racks
- Identify hazards in the inspectional area
- Determine actual load against rated capacity
- Perform systematic walk-around
- Identify wear, corrosion, damage, missing or incompatible parts, and signs of fatigue
- Categorize and document observations
- Apply safe inspection procedure
- Observe lean and deflection
- Select and use appropriate personal protective equipment (PPE), if required
- Use appropriate tools and equipment to conduct the inspection, if required

Inspection frequency
Section 4.43.1(8) requires storage racks to be inspected by a qualified person at regular intervals that will prevent the development of unsafe working conditions. In order to determine an appropriate inspection interval for the storage racks at a given workplace, the employer will need to review the various aspects of its operations and work environment. Some of the factors that may be relevant include the following:

- The nature of the environment in which the storage rack is located (e.g., indoors, outdoors, temperature, vibration, chemical exposure)
- Size of the facility
- Level of vulnerability of the storage rack to damage and failure
- Prior incidents of damage
- Nature of the operations, including equipment used around the storage racks
- Level of activity (e.g., seasonal fluctuations)
- Number of hours of work per week (e.g., shifts)
- Methods used to load and unload the storage racks
- Competency and training of the lift truck operators
- Procedures for reporting damage

Some employers may determine that daily inspections of their storage racks are appropriate due to the high-risk nature of their business operations (e.g., involving customer traffic, high volume mobile equipment traffic, and hazardous products stored). Other employers may determine that some of their storage racks are appropriate to be inspected every few months because their racks are isolated from traffic, they are only being used to store materials on a long-term basis, and the risk to workers is considered to be low.

Some employers may find it convenient to coincide the storage rack inspections with the regular joint health and safety committee or worker health and safety representative meetings to discuss the results of the storage rack inspections.

The frequency of inspections may change over time depending on the outcome and findings of successive inspections. In other words, if the selected inspection interval fails to prevent the development of unsafe conditions, then more frequent inspections may be necessary.

As a starting point, the employer may consult with the manufacturer of the storage rack or a professional engineer to determine the appropriate inspection frequency. Resources, such as the *CSA Standard A344-17, User guide for steel storage racks*, may also provide further guidance about the frequency of inspection.

G4.84(1) Eating areas – Unwholesome food

Issued January 1, 2005

Section 4.84(1) of the *OHS Regulation* ("*Regulation*") states:

> Workers must not keep or consume food in an area of a workplace where it could become unwholesome because of workplace

contaminants.

Section 4.84(1) refers to food becoming "unwholesome because of workplace contaminants." The term "workplace contaminants" means chemical or biological substances arising from workplace processes, and may include airborne contaminants or contaminants on surfaces, such as tables, benches, eating utensils, clothing, or skin. The employer must ensure food is not stored or consumed in areas where the presence of these contaminants could result in a hazard to workers as a result of ingestion with food or beverages. Typically the measures taken to ensure compliance would include worker orientation and training, posting of notices or signs, and effective supervision and enforcement.

G4.84(2) Eating areas – Storage and consumption

Issued January 1, 2005

Section 4.84(2) of the *OHS Regulation* ("*Regulation*") states:

> The employer must ensure that an area suitable for the storage and consumption of food is provided for workers if
>
> (a) there is a risk that food stored or consumed at a workplace may become unwholesome because of workplace contaminants, or
>
> (b) food storage or food consumption is restricted or prohibited at the workplace.

Storage and Consumption

The intent of section 4.84(2) is to ensure that, where there are restrictions on storage or consumption of food in work areas for any reason, the affected workers are able to access and use an area suitable for storage and consumption of their food.

An area suitable for food storage means a place where stored food is protected from workplace contaminants. It is not the intent to require the employer to provide temperature-controlled storage facilities, rather to require the employer to provide an area suitable for storage away from possible contaminants.

An area suitable for consumption of food typically means an area that is isolated from the contaminants in the workplace and that is equipped and maintained for safe consumption of food.

Suitability

If the employer provides an eating area, the following minimum floor area per person, based on the maximum number of persons scheduled to use the room at any one time, is recommended:

No. of persons	Floor area per person	
	In square metres	In square feet
25 and fewer	1.1 (min. 5.6 sq. m.)	12 (min. 60 sq.ft.)
26 to 74	.93	10
75 to 149	.65	7
150 to 499	.56	6
500 and more	.47	5

The floor, walls, and ceiling of an eating area should be finished with a material that can be easily maintained in a clean and sanitary condition. The eating area should have sufficient receptacles with self-closing lids provided and used for the disposal of all waste food and paper, and these should be maintained in a clean and sanitary condition and be emptied daily.

The air quality in an indoor eating area provided by the employer must meet the indoor air quality provisions of sections 4.70 to 4.80 of the *Regulation*. Preferably, an indoor eating area should have a total window area equal to at least 10% of the floor area, and windows capable of being opened should equal at least 5% of the floor area. Mechanical ventilation should be configured so no workplace contaminants are circulated into an eating area.

Work clothes, tools, equipment, or other articles should not be stored in an eating area if they may contain, or have on them, workplace contaminants.

In highly transient and/or short-term operations, where it is not practicable to provide an eating area, providing the opportunity to access public facilities or providing other options to the workers may be acceptable. For example, public facilities such as malls may be acceptable where they are readily accessible. In remote areas, other options may include a vehicle, such as a crummy in a logging operation.

Note: The above recommendations, for which an employer is required to provide an eating area, would also apply to eating areas that are voluntarily provided by the employer for locations where section 4.84(2) does not apply.

Exceptions

The following sections of the *Regulation* set out restrictions on the consumption or storage of food and prohibit or restrict smoking; the requirements in these sections supersede any choices or options provided by section 4.84 of the *Regulation*.

Part	Section	
Chemical and Biological Substances	5.26	Storage area (hazardous substances not to be stored in an eating area)
	5.84	Prohibition (against eating or drinking in a work area involving lead, mercury, asbestos, silica, or pesticides)
Substance Specific Requirements	6.56	Personal hygiene (eating or drinking prohibited near cytotoxic drugs)
	6.92	Cleanup of residues (surfaces of food preparation and eating areas to be free of pesticide residues)
	6.95	Wash and shower facilities (to be separate from food preparation and eating areas for workers handling pesticides)
	6.100	Location (pesticides not to be stored in food preparation, food storage, or eating areas)
Diving, Fishing and Other Marine Operations	24.66	Contaminated environments (no food or drink in diving exclusion or contamination zones)
Laboratories	30.17	Personal protection (eating, drinking, and food storage restrictions in laboratories)

G4.85(1)-1 Washroom facilities – Sufficient facilities

Issued January 1, 2005

Section 4.85(1) of the *OHS Regulation* ("*Regulation*") states:

> Except as provided by subsection (2), the employer must ensure that a sufficient number of plumbed washroom facilities are readily available for workers.
>
> …

In determining the number of facilities to provide, the calculations should be based on the anticipated largest number of workers on any shift at the workplace at one time; workers who spend more than 75% of their time away from the workplace may be excluded from the count. Recommendations for sufficient plumbed washroom facilities include the following:

- Where there are more than 9 workers, separate washrooms clearly signed for male and female workers. However, if the total number of workers on shift is 9 or fewer, or if a work area with 9 or fewer workers is located more than 60 metres (200 feet) from other washroom facilities, a single washroom for use by both male and female workers is generally suitable, provided it has a lockable door.
- In each female or male washroom, one toilet for 9 or fewer workers, two toilets for 10 to 24 workers, plus one more toilet for each additional 25 workers. If more than one toilet is required in a washroom for male workers, urinals may be substituted for half the recommended number of toilets.
- In each male or female washroom, one wash basin connected to a source of hot and cold water in each washroom containing one or two toilets and/or urinals, and at least one additional wash basin for each additional two such fixtures. If a large circular pedestal wash basin is provided, 60 centimetres (2 feet) of the circumference is generally considered equivalent to one wash basin.
- Washrooms should be designed so as to provide privacy for workers using the facilities.

G4.85(1)-2 Washroom facilities – Readily available

Issued January 1, 2005

Section 4.85(1) of the *OHS Regulation* ("*Regulation*") states:

> Except as provided by subsection (2), the employer must ensure that a sufficient number of plumbed washroom facilities are readily available for workers.
>
> …

Section 4.85(1) requires washroom facilities to be "readily available for workers." Generally, the walking distance from a working area to a washroom should not be more than 60 metres (200 feet). In multi-storied workplaces, washrooms should not be more than one floor above or below the working area.

In a workplace where the washroom facilities are not in a part of the building occupied by or under the control of the employer, the employer must

ensure suitable facilities are available to workers.

If public-use washrooms are available within walking distance at the workplace, the employer may utilize these facilities for workers provided the facilities are kept clean and sanitary and are of sufficient number to accommodate the total number of users, including the anticipated number of workers and the public. A risk assessment under the workplace violence provisions of the *Regulation* (section 4.28) may also be required where workers will be sharing washrooms with non-workers.

G4.85(2) Washroom facilities where no plumbing is available

Issued January 1, 2005

Section 4.85(2) of the *OHS Regulation* ("*Regulation*") states:

> (2) If plumbed washroom facilities cannot be provided because of the nature of the workplace or the nature of the work in which the worker is involved, the employer must
>
> (a) provide access to portable washroom and hand-washing facilities, or
>
> (b) make such other reasonable arrangements to accommodate workers as the circumstances allow, if access to portable washroom and hand-washing facilities cannot be provided.

Where access to or installation of plumbed facilities is not practical, portable toilets should be provided and maintained. The number of portable facilities (toilets and hand-washing facilities) should be sufficient for the number of workers, and the facilities should be readily accessible to workers. See OHS Guidelines G4.85(1)-1 and G.4.85(1)-2 for recommendations on the number of facilities and their location.

In highly transient or short-term operations, where it is not practicable to provide portable facilities, the needs of workers must be reasonably accommodated. Depending on the workplace location, workers may be given the opportunity to access alternative facilities such as those in parks or public buildings, or be provided with other options appropriate to the workplace location.

G4.85(3) Maintenance of washroom facilities

Issued January 1, 2005

Section 4.85(3) of the *OHS Regulation* ("*Regulation*") states:

> If washroom facilities are provided they must be
>
> (a) maintained in proper working order,
>
> (b) kept clean and sanitary, and
>
> (c) provided with the supplies necessary for their use.

The employer must ensure washroom facilities are maintained to meet the requirements of section 4.85(3). If the washroom facilities are not under the employer's direct control, the employer should ensure that all facilities intended for use by workers are maintained to meet the requirements of section 4.85(3).

Each washroom should be provided with a suitable waste receptacle and with the supplies necessary for the use of the facilities, such as a supply of soap, toilet paper, and hand-drying towels or air dryers

G4.86 Change areas

Issued January 1, 2005

Section 4.86 of the *OHS Regulation* ("*Regulation*") states:

> If the employer requires the worker to change into protective work clothing at the workplace, the employer must ensure that adequate change areas are provided.

For the purposes of section 4.86 the following definitions apply:

- **"Protective work clothing"** means any clothing provided by the employer to protect the worker from hazards in the workplace or to prevent contamination of the workplace by materials the worker may bring into it on their personal clothing.
- **"Change area"** means a room or similar area within the workplace that will allow individual workers privacy while changing into or out of street clothes as necessary to properly use protective clothing.

Section 4.86 is intended to ensure that workers who are required to remove their street clothes and put on protective work clothing to perform their work are assured of privacy while changing. An adequate change area would also provide for a suitable place for workers to store their personal clothing and personal effects while they are working. A change area should contain or be in close proximity to individual lockers for the

secure storage of the worker's clothing and personal effects.

Section 4.86 does not apply when workers put on coveralls, uniforms, or other work clothing or protective wear that does not require them to remove their street clothes.

Group change rooms may be provided but they should have provision for workers who wish personal privacy while changing clothes. A washroom with a lockable door or a room to which access can be restricted to ensure privacy may be suitable as a change room. A toilet stall with a locking door within a washroom would not normally be considered of sufficient size to function as a change area.

Certain sections of the *Regulation* set specific provisions for change areas, washing and/or shower facilities, and the handling of street clothing and protective clothing to ensure exposure to workplace contaminants is adequately controlled. The following table lists some examples:

Part	Section	
Chemical and Biological Substances	5.26	Work process involving substances such as lead, mercury, asbestos, silica, or pesticides
Substance Specific Requirements	6.55	Handling of personal protective equipment for workers exposed to cytotoxic drugs
	6.95	Provision of wash and shower facilities for personal hygiene for workers handling pesticides
	6.97	Handling of personal protective equipment for workers exposed to pesticides or pesticide residue
	6.107	Removing protective clothing for workers handling treated lumber
Diving, Fishing and Other Marine Operations	24.66	Diving operations at contaminated sites
Laboratories	30.17	Laboratories where toxic, radioactive, or biohazardous substances are handled

G4.87 Unsafe water

Issued January 1, 2005

Section 4.87 of the *OHS Regulation* ("*Regulation*") states:

> The employer must display at every plumbed non-potable water source from which a person might reasonably believe he or she can safely drink, a notice that the water is unfit for human consumption.

The intent of section 4.87 is to ensure workers are aware that non-potable water sources in the workplace are not to be used as a source of drinking water or for the preparation of food. A plumbed water source, other than one connected only to a domestic water supply system, is to be considered unfit for consumption unless it is protected against contamination and has been tested and found to meet potable water standards. The drinking water standards adopted by the local public health authority will be used to determine if a plumbed water source is potable and thus fit for consumption.

Some typical examples of non-potable plumbed water systems are those using untreated surface or groundwater (well water) sources for irrigation, industrial processes or cooling water, and fire protection or sprinkler systems.

Plumbed water sources supplying non-potable water must have a notice that the water is unfit for consumption. This may be achieved by conspicuously posting near taps or other outlets notices such as "DO NOT DRINK" or using a suitable symbol. In addition, workers should be informed of the significance of the signs and/or symbols as part of their orientation to the workplace.

Note: Drinking fountains and water taps providing drinking (potable) water for workers should be maintained in a clean and sanitary condition to ensure the water provided is maintained fit for consumption.

G4.65 Illumination levels

Issued September 1999; Revised January 1, 2005; Revised February 26, 2014

Regulatory excerpt
Section 4.65 of the *OHS Regulation* (*"Regulation"*) states in part:

> (1) Except as otherwise provided in this section and section 4.69, an employer must provide and maintain minimum illumination levels to ensure safe working conditions, safe passage and the identification of hazards or obstructions as follows:

(a) 22 lux (2 fc) in areas of low activity, such as parking lots, building exteriors, outside areas and basement areas housing machinery, but which are not regular task areas;

(b) 54 lux (5 fc) in areas of high activity, such as frequently used walkways and building access and egress points.

(1.1) Cap lamps or other local sources of illumination acceptable to the Board must be used if the light intensity in a work area is less than 22 lux (2 fc) and it is impracticable to provide illumination by any other means.

(2) For tasks which require the ability to distinguish detail an employer must provide and maintain illumination as required by Table 4-1.

(3) For work processes which require lower illumination levels than those specified in subsections (1) and (2), such as photographic darkrooms, fish hatching rooms and poultry catching operations, the employer may use other effective means to ensure the safety of workers.

Purpose of this guideline
The purpose of this guideline is to provide information on the types and levels of illumination for various activities.

Information on types and levels of illumination
Section 4.65 of the *Regulation* requires the employer to provide and maintain minimum illumination levels to ensure safe working conditions, safe passage, and the identification of hazards or obstructions.

Section 4.65(1.1) addresses illumination in outdoor areas during low light conditions. The term "cap lamp," which is commonly used in the mining industry, includes head lamps.

For tasks that require the ability to distinguish detail (for example, weaving, fine hand-painting, and precision manual arc welding) section 4.65(2) requires the employer to provide and maintain the illumination levels listed in Table 4-1. The illumination levels listed in Table 4-1 are based on Figure 11-1 of the *Lighting Handbook: Reference and Application* (8th edition), published by the Illuminating Engineering Society of North America. Figure 11-1 presents a range of illumination levels, whereas Table 4-1 presents only the minimum levels listed in Figure 11-1. As the *Regulation* specifies a minimum illumination level, some workers may complain about inadequate lighting. The *Lighting Handbook* should be used for guidance in resolving such complaints. WorkSafeBC can only require illumination be provided to the level specified in the *Regulation*.

The following factors should be considered in selecting an illumination level:

- Type of activity performed within a space
- Characteristics of the visual task
- Age of the occupant
- Importance of speed and accuracy in performing the visual task
- Reflectance of the task surface

In agriculture, many visual tasks need only lower lighting levels, and fall into task categories 1 and 2 of Table 4-1. As workers will be required to read pesticide labels, mixing of pesticides in storage areas is an activity that will likely fall into task category 2.

For further guidance, refer to Chapter 11 of the *Lighting Handbook: Reference and Application* (8th edition).

Section 4.65(3) permits an employer to use "other effective means" to ensure the safety of workers for work processes that require lower illumination levels. In addition to the activities mentioned in the *Regulation*, the performing arts industry may have operational requirements for reduced illumination levels during rehearsals and performances. In agriculture, low illumination levels are often required in poultry and in mushroom operations. "Other effective means" might include the use of strip lighting in aisles, illuminating paint, safelights and handheld flashlights. It is important that proper access and exit routes be available and be free of tripping hazards and any obstructions.

G4.66 Means of illumination

Issued September 1999

Section 4.66 of the *OHS Regulation* requires the employer to provide general or local lighting, or an effective combination of the two, in order to meet the lighting requirements of section 4.65. Lighting may be provided by artificial means, such as fluorescent lights, or by natural light (daylight). For indoor operations, artificial lighting systems are generally required to maintain the minimum light levels and may be supplemented with natural light. Natural light may cause problems such as glare and brightness, and these issues are covered by section 4.67. Outdoors, natural light will need to be supplemented by artificial light as necessary during nighttime and possibly on a dark, dull day.

G4.67 Brightness, reflectance and glare

Issued September 1999

Section 4.67 of the *OHS Regulation* requires the employer, as far as practicable, to design and maintain the workplace so as to adequately control brightness ratios, reflectance values, and glare. Some ways of achieving this are by moving light fixtures, installing blinds, relocating a workstation, painting with low gloss paints, and covering highly reflective surfaces.

G4.68 Illumination measurement

Issued September 1999

Section 4.68 of the *OHS Regulation* requires that the employer measure illumination in accordance with the procedures in the *Lighting Handbook: Reference and Applications* (8th Edition), published by the Illuminating Engineering Society of North America. Chapter 2 of the Handbook discusses how light and other radiant energy is measured. For taking measurements of illuminance in the field, the Handbook suggests that:

- any conditions that might affect the readings, such as interior surface reflectance, lamp type and age, voltage, and survey instruments, be noted,
- detectors be cosine and colour corrected (required by section 4.68(2) of the Regulation),
- detectors be used at temperatures between 15 and 50 degrees Celsius (60 and 120 degrees Fahrenheit),
- care be taken to avoid casting shadows or reflecting light onto the detector, while taking readings,
- lighting systems be on for at least one hour to ensure that normal operating output has been attained, before measurements are taken,
- for interior measurements, the area be divided into 60 cm (2 ft.) squares, the readings be taken 76 cm (30 in.) above the floor, and then averaged, and
- daylight is excluded from the readings, if possible.

G4.69 Emergency lighting

Issued September 1999; Revised consequential to the February 1, 2015 Regulatory Amendment

Regulatory excerpt
Section 4.69 of the *OHS Regulation* ("*Regulation*") states:

> (1) If failure of a lighting system would create conditions dangerous to the health and safety of workers, an emergency lighting system must be provided for the workplace and the exit routes.
>
> (2) An emergency lighting system must 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.
>
> (3) An emergency lighting system in a fixed facility must meet the requirements of section 3.2.7 (Lighting and Emergency Power Systems) of the *BC Building Code* with regard to
>
> (a) illumination level,
>
> (b) use of recessed fixtures,
>
> (c) duration of emergency lighting,
>
> (d) the use of self-contained emergency lighting units, and
>
> (e) emergency electrical power supply.
>
> (4) The emergency lighting system must be inspected, tested and maintained to meet the requirements of section 6.5 (Emergency Power Systems and Unit Equipment for Emergency Lighting) of the *BC Fire Code*.

Purpose of the guideline
The purpose of this guideline is to summarize the *BC Building Code* and *BC Fire Code* requirements for an emergency lighting system.

Requirement for an emergency lighting system
Section 4.69(1) requires that the employer provide an emergency lighting system for the workplace and the exit routes if the failure of a lighting system could create conditions dangerous to the health and safety of workers. Section 4.69(3) requires that the emergency lighting system meet the requirements of section 3.2.7 of the *BC Building Code* with regard to the following:

- Illumination level
- Use of recessed fixtures
- Duration of emergency lighting
- Use of self-contained emergency lighting units
- Emergency electrical power supply

The requirements of section 3.2.7 are summarized in the table below.

Requirements for Emergency Power Systems (*BC Building Code*)

Item	Requirement(s)
Illumination level	10 lx (average) at floor or tread level, or, in the case of a service space, at floor or catwalk level.
Recessed fixtures	Must not be located in an insulated ceiling unless the fixture is designed for such an installation.
Duration of emergency lighting	Ranges from 30 minutes to 2 hours, depending on the height of the building and the occupancy.
Self-contained emergency lighting units	Must conform to *CSA Standard C22.2 No. 141, "Unit Equipment for Emergency Lighting."*
Emergency electrical power supply	Must be provided by a power source, such as a generator or batteries, capable of supplying power for the duration outlined above in the event that the regular power to the building is interrupted. Must be installed in conformance to: • *CSA Standard Z32, "Electrical Safety and Essential Electrical Systems in Health Care Facilities"* for "treatment occupancies," which includes facilities where medical treatment or accommodation for such treatment is provided, or • *CSA Standard C282, "Emergency Electrical Power Supply for Buildings"* for other buildings. If the emergency electrical power supply is dependent on a fuel supply from outside the building, that fuel supply shall be provided with a suitably-identified separate shut-off valve outside the building.

Section 4.69(4) requires that the emergency lighting system be inspected, tested, and maintained to meet the requirements of section 6.5 of the *BC Fire Code*. The requirements of section 6.5 are summarized in the table below.

Inspection, Testing and Maintenance of the Emergency Lighting System

Item	Requirement(s)
Inspection, testing and maintenance	The emergency power system must be inspected, tested, and maintained in accordance with: • *CSA Standard Z32, "Electrical Safety and Essential Electrical Systems in Health Care Facilities"* for health care facilities, or • *CSA Standard C282, "Emergency Electrical Power Supply for Buildings"* for other buildings.
Notification	Supervisory staff must be notified when an emergency power system (or any part thereof) is shut down.
Instructions	Where an emergency power system is installed, instructions must be provided for switching on essential loads and for starting the generator when this is not done automatically.
Records	Must be maintained as required by *CSA Standard C282, "Emergency Electrical Power Supply for Buildings."*
Supply of fresh fuel	Liquid fuel storage tanks must be drained and refilled with fresh fuel at intervals not greater than 12 months.
Inspection of unit equipment	Self-contained emergency lighting unit equipment must be inspected at intervals not greater than one month. Self-contained emergency lighting unit equipment must be tested • At intervals not greater than one month to ensure that emergency lighting will function if the primary power supply fails, and • At intervals not greater than 12 months to ensure that the unit will provide emergency lighting for a duration equal to the design criterion under simulated power failure conditions. After a 12 month interval test, the voltage and current charging conditions, as well as the recovery period, must be tested to ensure that the charging system is functioning in accordance with the manufacturer's specifications.

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WORKING ALONE OR IN ISOLATION

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G4.65 Illumination levels
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INDOOR AIR QUALITY

G4.79 Moulds and indoor air quality

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G4.81/4.82 Controlling exposure to environmental tobacco smoke (ETS) and e-cigarette vapour
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G4.84(1) Eating areas - Unwholesome food
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G4.20.1 Definition of working alone or in isolation

Issued February 1, 2008; Editorial Revision November 20, 2008

Regulatory excerpt
Section 4.20.1 of the *OHS Regulation* ("*Regulation*") states:

> In sections 4.20.2 to 4.23, "to work alone or in isolation" means to work in circumstances where assistance would not be readily available to the worker
>
> (a) in case of an emergency, or
>
> (b) in case the worker is injured or in ill health.

Purpose of guideline
The purpose of this guideline is to provide information on when a worker is considered to be working alone or in isolation. This includes criteria for determining if a worker has assistance that is readily available.

Application
The requirements of sections 4.20.2 to 4.23 are intended to safeguard workers, as defined in the *Workers Compensation Act* ("*Act*"), who are assigned to work alone or in isolation. If an individual who is assigned to work alone or in isolation does not fall under the definition of a "worker" then the requirements do not apply. In addition, the requirements only apply when assistance is not readily available to the worker in the event of an emergency, injury, or illness.

Assistance that is readily available
A worker is considered to be working alone or in isolation when he or she does not have assistance that is readily available in case of emergency, injury, or ill health. In order to determine whether or not assistance is readily available, the following conditions should be considered:

- Presence of others: Are other people in the vicinity?
- Awareness: Will other persons capable of providing assistance be aware of the worker's need?
- Willingness: Is it reasonable to expect those other persons will provide assistance?
- Timeliness: Will assistance be provided within a reasonable period of time?

Relying on customers for assistance
Different circumstances may prevail that will require employers to make a reasonable assessment to determine assistance is readily available. In a retail premises, such as a convenience store, customers are not generally considered to meet the definition of assistance that is readily available. However, if the worker is in an area where there is a high volume of customers, such as a shopping mall or sports stadium, there may be security staff or workers of other employers available to provide assistance.

Agreements with other employers
If two or more workers of different employers are working together or in the same vicinity and each worker is capable of and willing to provide assistance in a timely manner, this can qualify as assistance that is readily available. An example of this would be where a coffee or donut retailer is situated within premises shared with a retail gas vendor. Another example would be where a second worker is on the premises for a short period of time, such as to make deliveries or pickups. In this case, the worker only has assistance that is readily available for the period in which the additional worker is on the premises, and is considered to be assigned to work alone once the additional worker leaves the premises. Employers would need to ensure that the workers of both employers are capable of, and willing to, provide assistance and that the workers are aware of the

arrangement, and should put the arrangement in writing.

Communication systems
Providing workers with electronic means of communication, such as a phone, radio, or personal alarm, does not guarantee that the condition of "assistance that is readily available" has been met. A "person check" system alone is also unlikely to meet the "readily available" test.

If a worker cannot be seen or heard by persons capable of providing assistance in a timely manner, then he or she should be regarded as working alone or in isolation.

G4.20.2 Hazard identification, elimination, and control

Issued February 1, 2008; Revised November 20, 2008

Regulatory excerpt
Section 4.20.2 of the *OHS Regulation* ("*Regulation*") states:

> (1) Before a worker is assigned to work alone or in isolation, the employer must identify any hazards to that worker.
>
> (2) Before a worker starts a work assignment with a hazard identified under subsection (1), the employer must take measures
>
> (a) to eliminate the hazard, and
>
> (b) if it is not practicable to eliminate the hazard, to minimize the risk from the hazard.
>
> (3) For purposes of subsection (2) (b), the employer must minimize the risk from the hazard to the lowest level practicable using engineering controls, administrative controls or a combination of engineering and administrative controls.

Purpose of guideline
The purpose of this guideline is to define the phrase "assigned to work alone or in isolation," outline ways to conduct a risk assessment to identify hazards to workers assigned to work alone or in isolation, and describe some steps an employer may take to eliminate or minimize identified hazards.

Assigned to work alone or in isolation
The requirements of sections 4.20.2 apply when a worker is *assigned to work alone or in isolation*. Being assigned to work alone or in isolation means that the worker

- Is directed or expected to work during a scheduled or predetermined period of time, such as a specified work shift or a specified portion of a work shift
- During that time it is anticipated or expected that the worker will be working alone or in isolation

Workers who work alone or in isolation for short or intermittent periods of time without being directed to do so are not considered to have been "assigned" to work alone. For example, a worker in most office and similar work settings, where other workers are normally present during their work hours, is not considered to be assigned to work alone or in isolation if, for example, the worker decides to come in early, work late, or come in on a day off. While a worker in such a setting may choose to work alone and this is permitted by the employer, the worker is not considered to have been assigned to work alone. Accordingly, the provisions of sections 4.20.2 to 4.23 would not apply.

Importantly, employers still have obligations to ensure the health and safety of these workers even though the provisions of sections 4.20.2 to 4.23 may not apply. These obligations include the following.

First, the general duties of employers to workers under section 115 of the *Workers Compensation Act* ("*Act*") apply, including the duty to ensure the health and safety of all workers working for that employer. Where workers are permitted to work alone outside of their regular assigned working hours, the employer must perform a risk assessment relating to the hazards the worker may be exposed to while working alone, and take the necessary measures to ensure the worker's safety. These measures may include implementing a person check system but may consist of other procedures that will meet this goal. The content of this guideline dealing with hazard assessments and person check systems can be of assistance to employers in meeting their obligations under the *Act*.

Second, employers are required under section 4.28 of the *Regulation* to conduct a risk assessment in any workplace where there is a risk of injury to workers from violence arising out of their employment. This risk assessment should include considerations of the risks of violence associated with working alone or in isolation, where workers are permitted to work alone or in isolation. This risk assessment is required regardless of whether or not workers have been assigned to work alone.

Finally, under the first aid provisions of the *Regulation*, employers are required to keep up-to-date written procedures for providing first aid at the worksite. Under section 3.18 of the *Regulation*, employers must provide an effective means for communication between the first aid attendant and the workers served. This includes providing effective communication for workers who are working alone, including those who have not been assigned.

Identification, elimination and control
Common situations and occupations where a worker may be assigned to work alone or in isolation and exposed to hazards include

- A worker who handles cash such as a convenience store clerk, retail outlet employee, parking attendant, and taxi driver
- A worker who meets clients out of the office such as a home care worker, or a social service worker
- A worker who does hazardous work with no regular interaction with other people such as a forestry worker, boom boat operator, a worker in the freezer area of a cold storage facility, or a night cleaner in a plant
- A worker who is performing work activities alone that may lead to slips or falls, including the use of ladders, or stocking high shelves
- A worker who is at risk of violent attack who is isolated from other workers or public view such as a security guard, custodian, and a night shift employee in a community care or outpatient department

The employer is expected to assess the likelihood of hazards to workers assigned to work alone or in isolation. The assessment of the hazards should be based on what reasonably could be anticipated for that workplace or work activity.

There are a number of ways to perform the assessment.

Depending upon the number of workers and the complexity of the potential hazards, the assessment process may be as simple as a short discussion held with workers who are given an opportunity for input or as complex as using an assessment team for the workplace or for each department. Assessment teams should include those workers and employer representatives with the knowledge and experience to provide the best input into the process. Another option is for an employer to hire a consultant to work with workers and employer representatives in conducting the assessment.

Where available, members of the joint health and safety committee or the worker health and safety representative should be invited to participate. They can serve as members of the team or act in a consultative role.

Employers should review the method of assessment and redo the assessment if there is a significant change in the nature of the business or the location of the workplace or in the event of a serious incident. Again, where available, the joint committee or the worker health and safety representative should be invited to participate in any review.

Risk assessment process
The assessment is a step-by-step process that first identifies the nature and type of hazard that could reasonably be anticipated in the workplace, followed by an assessment of the likelihood of such hazards occurring. This assessment should help the employer set priorities and identify tasks that require further analysis to ensure that effective controls can be implemented.

While the size and type of workplace and the nature of the work will dictate the complexity of the assessment, it should generally follow the process outlined below:

- Gather information on previous incidents where workers were exposed to hazards while working alone or in isolation in the workplace, generally over a period of at least a year, preferably 3 years.
- Gather information on experience in similar workplaces, including severity and frequency of any hazards that workers working alone or in isolation have been exposed to. Sources of information may include the Internet, NIOSH, industry associations, or the police.
- Determine the hazard control measures, if any, already in place at the workplace.
- Obtain staff and Joint Health and Safety Committee (JHSC) input (using questionnaires, surveys, formal and informal discussions, and interviews, as appropriate to the size of the workplace).
- Inspect the workplace for hazards.
- Analyze the information.

To determine specific situations that may expose workers to hazards, consider factors such as

- Occupations and locations that may be at higher risk. Some assistance in making this determination is available by consulting the Assigned Hazard Rating List under Part 3 of the OHS Guidelines which provides a hazard rating for various occupations and industries.
- Types of tasks that may place workers at higher risk. Higher risk tasks may include working with machinery, working from heights, using explosives, or other activities where serious accidents or injuries have occurred in the past.
- Types of foreseeable interactions that may place workers at higher risk. Higher risk interactions may include repossessing furniture, issuing fines or other monetary penalties directly to individuals, working with aggressive or unpredictable patients in a healthcare facility, or other interactions that may involve aggravated individuals.

In addition, consider other factors such as

- The specific workplace layout, including furniture design and placement, and the location of entrances and exits
- The location of the workplace, and the emergency response time necessary to get there in the event of an emergency
- Whether or not the worker may be attacked by an animal or encounter a poisonous material
- The climate of the work environment, including whether or not the worker may be exposed to extreme weather conditions or temperatures
- Whether or not the work is physically demanding so that the worker may be fatigued
- Age, experience, and training of the workers who may be at risk
- Type of equipment, tools, and supplies available for use, including emergency communication equipment and emergency supplies such as food and drinking water and appropriate first aid equipment
- Whether or not the worker will need to carry some or all of the emergency supplies and first aid equipment with them during work activities
- Work activities which take a worker out of a safe environment, such as cleaning the area around the gas pumps at 2 a.m.
- Staff deployment and scheduling, including the extent to which persons work at night, the system for checking up on workers who work

alone (see *Regulation* sections 4.21 to 4.23 and associated guidelines on person check systems and working alone in late night retail)

Eliminating hazards
If employers identify a hazard under section 4.20.2(1) of the *Regulation*, the hazard should be eliminated where practicable. The following are examples of how hazards could be eliminated:

- Use video surveillance to remotely monitor an area instead of using an on-site security guard
- Install an automated payment system for services, such as parking, instead of using a cashier/attendant
- Use vending machines to dispense food or other convenience items rather than using a checkout cashier

Minimizing the risk of a hazard
If hazards cannot be eliminated, or it is not practicable to do so, employers should try to minimize the risk from the hazard occurring. The options available to achieve this result are administrative controls and engineering controls.

Part 1 of the *Regulation* has the following definitions:

"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;

"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;

In selecting measures to reduce risk, preference should be given to implementing available and practicable engineering controls. These controls generally provide "passive protection" which is not dependent on a person taking a specific action. This can be particularly important in an emergency or crisis situation. However, where engineering controls are not practicable or do not reduce the risk to a level that is as low as practicable, administrative controls will need to be developed and implemented.

Some examples of engineering controls include physical arrangements in the workplace to separate the worker from the customers and public by locked doors, pay windows, barriers that are substantial enough to prevent access to the worker, or use of another type of secure enclosure.

Examples of administrative controls include the use of some or all of the following:

- Rearrange the work schedule so that more than one person is always present in the workplace
- Rearrange work schedules so that the hazardous work, such as that which presents a falling hazard, is done while more than one worker is working
- Require that the worker contact the person/company responsible for checking the well-being of the worker to ensure that a person check is done before and after the expected completion time of a possibly hazardous activity
- Require mandatory on-site supervision of young workers by an adult
- Use cash handling procedures that require the use of a locked drop safe, keeping only small amounts of cash accessible on the site, installing surveillance cameras, and posting signs indicating that the amount of cash on site is limited
- Use uniformed security guards
- Prohibit high-risk work activities during times when a worker is working alone
- Use a personal emergency call device that a worker may wear on a lanyard around his/her neck and use to call for help in the event of a personal security or emergency issue

Complying with other sections
Before allowing work to commence, an employer must ensure that doing so would not violate other sections of the *Regulation*. For example, section 3.17.1 prohibits commencing work in a workplace that is only accessible by air service if air service is unavailable. In such a workplace, workers would be considered to be working alone or in isolation because assistance is not readily available. In this example, conducting a hazard assessment and taking steps to eliminate or minimize hazards under 4.20.2 does not mean work can commence. Work may only commence once the conditions of 3.17.1 have been satisfied.

G4.21 Procedures for checking the well-being of workers

Issued Feb 1, 2008; Revised April 9, 2008; Revised November 20, 2008; Revised December 21, 2009

Regulatory excerpt
Section 4.21 of the *OHS Regulation* ("*Regulation*") states:

> (1) The employer must develop and implement a written procedure for checking the well-being of a worker assigned to work alone or in isolation.
>
> (2) The procedure for checking a worker's well-being must include the time interval between checks and the procedure to follow in case the worker cannot be contacted, including provisions for emergency rescue.
>
> (3) A person must be designated to establish contact with the worker at predetermined intervals and the results must be recorded by the person.

(4) In addition to checks at regular intervals, a check at the end of the work shift must be done.

(5) The procedure for checking a worker's well-being, including time intervals between the checks, must be developed in consultation with the joint committee or the worker health and safety representative, as applicable.

(6) Time intervals for checking a worker's well-being must be developed in consultation with the worker assigned to work alone or in isolation.

Purpose of the guideline
The purpose of this guideline is to

- Provide information on the application of the requirements for checking the well-being of workers assigned to work alone or in isolation
- Elaborate on time intervals to use when checking the well-being of workers
- Provide information on acceptable methods for checking, including
    - technologies with particular application in populated areas,
    - means of checking that may be of particular use in remote locations, and
    - use of non-workers, such as family members, in certain limited circumstances

Application
As of February 1, 2008, the requirement to develop and implement a written procedure for checking the well-being of workers under 4.21 *applies to all workplaces where workers are assigned to work alone or in isolation.*

Previously, section 4.21 applied to *workers who were working alone under conditions which present the risk of disabling injury if the worker might not be able to secure assistance in the event of injury or other misfortune.* As of February 1, 2008, the requirement to be working under certain conditions has been removed, and section 4.21 now applies to all workplaces where workers are assigned to work alone or in isolation.

Section 4.21 only applies to workers who are assigned to work alone or in isolation. An employer may still have general duty obligations to check on the well-being of a worker who is working alone or in isolation without being assigned to do so. For further discussion of what it means to be *assigned to work alone or in isolation*, as well as the general duty obligations of an employer, see *G4.20.2 Hazard identification, elimination, and control*.

Time intervals
Time intervals should be developed after considering the risks to which the worker is exposed. They must be developed in consultation with the worker assigned to work alone or in isolation, and with the joint committee or worker health and safety representative as applicable. This may be done as part of the hazard identification process required under section 4.20.2 of the *Regulation*. High-risk activities require shorter time intervals between checks.

Methods for checking well-being
In selecting procedures to check a worker's well-being, employers should give preference to procedures which allow for the visual confirmation of the worker's well-being. An alternative is two-way voice contact between workers at the site. Where this is not practicable, employers may use other approaches. For example, an employer could require workers to make phone calls at regularly scheduled intervals to workers at another location.

Employers may also decide to use one of a number of available technologies to check the well-being of workers. An acceptable system is one that allows the worker to send an OK signal at predetermined intervals and which activates procedures to contact the worker or initiate emergency response if the worker does not send a signal at a predetermined interval or if a signal for assistance is received. If such a technology is used the employer is still required to develop written procedures and ensure there is the appropriate documentation of check-ins.

Information is provided below on technologies and systems that may have particular application in populated areas. In addition, there is discussion of various types of check systems that may be particularly applicable to work in remote locations.

Use of worker check technologies - in populated areas
Technologies that may be of assistance, particularly in populated areas include, but are not limited to

- **Call-in systems:** These systems are available from security service providers and only require access to a phone. Workers call into the system at scheduled intervals during their shift and enter a code to confirm their safety. In the event that a worker fails to phone in by his or her scheduled interval, the service provider follows a predetermined protocol to make contact with the worker. If the worker cannot be contacted, emergency assistance will be sent.

- **Externally monitored panic alarm devices:** A number of security service providers offer panic alarm devices for use in their service area, which workers can carry with them, eliminating the need for access to a phone. As is the case with call-in systems, panic alarm devices can be programmed to require a worker to confirm his or her safety at scheduled intervals.

  Some devices also offer a "person down" feature, which will notify the service provider when a worker does not move for a given period of time, as well as a panic button, which will automatically alarm the service provider of an emergency. In the event that the person down or panic alarm feature is activated, or a worker fails to confirm his or her safety at a scheduled interval, the service provider will attempt to contact the worker before emergency assistance is sent. These devices are designed to be carried on the worker at all times, and can be

worn around the worker's neck or on his or her belt. It is the employer's responsibility to ensure that workers consistently wear the device when assigned to work alone or in isolation.

- **Internally monitored panic alarm devices:** Panic alarm devices can also be purchased with a monitoring station that is operated by the employer, rather than a security service provider, for use in their workplace. The employer's monitoring station can be linked to a number of different panic alarm devices, and will emit an audible signal in the event that a worker fails to confirm his or her safety or the person down or panic button features are activated. In such cases, the employer is expected to follow their written procedures to ensure the worker is contacted or assistance is provided.

  As with the other systems, the procedures for an internally monitored device must include the intervals at which a worker is expected to confirm his or her well-being. At a minimum, the monitoring station must be checked at these intervals by the worker assigned to check the well-being of the workers who are assigned to work alone or in isolation, and the results of the checks recorded. To ensure that assistance is provided quickly in the event that a panic alarm or person down feature is activated by a worker, the station should be monitored more regularly. This can be accomplished by having the worker(s) responsible for checking the station remain within the vicinity of the station, as is practicable, so that they can be alerted in the event that an audible signal is emitted.

Checking worker well-being in remote locations
Examples of work activities in remote areas include range riding, timber cruising, surveying, fire watch, beetle probes, mineral exploration, seismic blasting, and guide work. Working alone in such areas can present particular risks given that the work is typically done outdoors, and often in difficult terrain or otherwise relatively inaccessible areas.

Such areas also present particular challenges to providing a means of checking worker well-being. Land-based telephone lines and security services are typically unavailable, and cell phone coverage may be limited or non existent.

However, there are a number of types of systems that may be of use in such locations. Examples include

- **Wireless satellite hand-held alerting and tracking devices:** These are proving to be a promising type of system at a relatively modest cost. Several systems are available, and provide capabilities such as alerts, simple messaging, and very importantly GPS coordinates of the worker. Systems are available that can provide coverage in most outdoor situations. Such systems should be tested for reliability in the areas they are intended to be used.

- **Satellite phones:** These can also be effective in remote areas, and offer the advantage of permitting extended two-way voice communication. They should be evaluated for reliability in the areas they are intended to be used.

- **Radio transmitters:** In some circumstances, for example where there is a relatively permanent base site with power generation capability, it may be feasible to use a radio transmitter that provides surface-to-surface radio contact. In some areas there are repeater systems that can be accessed for a wider area of communication.

- **Crew contact:** Where a crew is working in a remote location but the work involves working alone, it may be possible to arrange work so that the crew will meet periodically during the work day, or have another means of alerting one another. If a worker doesn't arrive on time at the pre-determined point, or otherwise signal his or her well-being then a search procedure can be initiated by the other worker(s). The successful use of this approach involves the following five elements:
  - A pre-determined meeting place or other means of contact
  - A pre-determined time for contact
  - Information provided by the workers beforehand on their expected routes and areas of activity
  - A procedure for the crew to follow in the event a worker does not make contact
  - A plan in place to find a missing worker

  In addition, depending on any limits to the kind of assistance that the co-workers on the crew can provide, it may be necessary to have an effective means of communication between the crew and the home base for the operation. While section 4.21 of the *Regulation* only applies to workers who are alone, the general duties of employers to workers under section 115 of the *Act* still apply. This includes the duty to ensure the health and safety of all workers working for that employer. Where crews are working in remote locations, the employer must perform a risk assessment relating to the hazards the workers may be exposed to, and take the necessary measures to ensure the workers' safety. This may include implementing a system to check on the well-being of the crew.

Use of non-workers
There are circumstances where an employer may choose to use a non-worker as the person designated to contact the worker. This practice should be limited in application as having non-workers, such as family members, perform person checks raises issues given that these individuals are not accountable to WorkSafeBC or the employer.

The use of non-workers as the established contact person is acceptable only in situations where it is a reasonable means to perform effective person checks. That would typically be in low and negligible-risk scenarios. Further, the employer must take steps to ensure that the non-worker has received training, as required by section 4.22, and that the person is following the employer's written procedures.

Issued February 1, 2008; Editorial Revision February 21, 2008; Formerly Issued in G4.22.1 - Reissued as G4.22.1-1 September 9, 2008; Revised November 20, 2008; Editorial Revision June 30, 2009; Editorial Revision to include February 1, 2011 Regulatory Amendment; Editorial Revision consequential to April 15, 2012 Regulatory Amendment

Regulatory excerpt
Section 4.22.1 of the *OHS Regulation* ("*Regulation*") states:

(1) In this section:

"*late night hours*" means any time between 11:00 p.m. and 6:00 a.m.;

"*late night retail premises*" means

(a) a gas station or other retail fueling outlet, or

(b) a convenience store or any other retail store where goods are sold directly to consumers

that is open to the public for late night hours;

"*violence prevention program*" means a program implemented under subsection (2)(b)(iii).

(2) If a worker is assigned to work alone or in isolation in late night retail premises and there is any risk of harm from a violent act to the worker, then, in addition to any other obligations the employer has under sections 4.20.2 to 4.23 and 4.28 to 4.30,

(a) the employer must develop and implement a written procedure to ensure the worker's safety in handling money, and

(b) when that worker is assigned to work late night hours, the employer must also do one or more of the following:

(i) ensure that the worker is physically separated from the public by a locked door or barrier that prevents physical contact with or access to the worker;

(ii) assign one or more workers to work with the worker during that worker's assignment;

(iii) implement a violence prevention program in accordance with subsections (2.1) to (2.3).

(2.1) A violence prevention program must include procedures, policies and work environment arrangements necessary to ensure that all of the following requirements are met:

(a) there is a time lock safe on the premises that cannot be opened during late night hours;

(b) cash and lottery tickets that are not reasonably required in order to operate during late night hours are stored in the time lock safe referred to in paragraph (a);

(c) there is good visibility both into and out of the premises;

(d) there is limited access to the inside of the premises;

(e) the premises is monitored by video surveillance;

(f) there are signs on the premises, visible to the public, indicating that

(i) the safe on the premises is a time lock safe that cannot be opened during late night hours,

(ii) there is a limited amount of accessible cash and lottery tickets on the premises, and

(iii) the premises is monitored by video surveillance;

(g) a worker described in subsection (2)

(i) is at least 19 years of age, and

(ii) is provided with a personal emergency transmitter that is monitored by

(A) the employer, or

(B) security company or other person designated by the employer.

(2.2) By the end of the first year of the implementation of a violence prevention program and by the end of every second year after that first year, the employer must receive a security audit report, in writing, from an independent qualified person confirming that the program meets all of the requirements under subsection (2.1).

(2.3) The written security audit report referred to in subsection (2.2) must be

(a) retained by the employer, and

(b) posted by the employer in the workplace

for a period beginning on or immediately after the date the report is received and ending no earlier than the date on which the next report is posted.

Purpose of guideline
The purpose of this guideline is to provide information about how to determine whether a workplace is considered to be a late night retail premises. The guideline also provides information on money handling procedures. The Violence Prevention Program option is covered in G4.22.1-3.

Application
The requirements of 4.22.1 only apply if all of the following conditions are satisfied:

(1) The worker is working alone or in isolation (see G4.20.1)

(2) The worker is working in a late night retail premises

(3) It is between the hours of 11:00 p.m. and 6:00 a.m.

Retail premises
A late night retail premises is defined as a gas station or other fueling outlet, a convenience store, or any other retail store where goods are sold directly to consumers, and is open any time between 11:00 p.m. and 6:00 a.m. "Other retail stores" are shops or other premises where the primary business conducted is the sale of products directly to consumers. These businesses generally have products for sale on display or available to the consumers to be taken away from the premises. Some examples of other retail stores include

- Coffee shops
- Money marts
- Liquor off-sales
- Take-out food restaurants

Examples of workplaces which do **not** meet the definition of other retail stores because goods are not sold directly to customers, or are not sold from a retail store include

- Full service restaurants
- Pubs or bars
- Taxicabs and limousine services
- Toll booths
- Hotel check-in desks
- Food and other merchandise sold from street carts

While these workplaces are not generally considered to be late night retail premises, employers must still comply with the other working alone or in isolation requirements. This includes requirements under section 4.20.2 of the *Regulation* to identify and control hazards presented to any workers assigned to work alone or in isolation, and under section 4.21 of the *Regulation* to develop and implement a procedure for checking the well-being of the worker.

Written procedures for handling money
Section 4.22.1(2)(a) requires that employers develop and implement a written procedure to ensure a worker's safety in handling money. A procedure should include some or all of the following:

- Ensure cash handling areas are located away from entrances and exits
- Ensure sales counters are located so they are clearly visible from inside and outside the store
- Keep as little cash in the cash register as possible
- Place large bills in a drop box or strong room that is out of sight
- Fit counter safes with time delay locks
- Use only one cash register and leave the cash tray of the unused register open and visible

A procedure for handling money should also include the following guidelines for making bank deposits:

- Avoid making bank deposits at night
- Vary the time and route for making deposits
- Don't carry money in bags marked with the company logo or that make it obvious that cash is being transported
- Make deposits with a co-worker, where practicable. The co-worker should face away from the depository to keep an eye on other people in the area

Issued February 1, 2008; Editorial Revision February 21, 2008; Formerly Issued in G4.22.1 - Reissued as G4.22.1- 2 September 9, 2008; Editorial Revision November 20, 2008; Editorial Revision August 1, 2009; Editorial Revision March 30, 2010; Editorial Revision January 5, 2011; Revised July 29, 2011; Revised consequential to February 1, 2012 Regulatory Amendment; Editorial Revision consequential to April 15, 2012 Regulatory Amendment

Regulatory excerpt
Section 4.22.1(2)(b) of the *OHS Regulation* ("*Regulation*") states:

> (2) If a worker is assigned to work alone or in isolation in late night retail premises and there is any risk of harm from a violent act to the worker, then, in addition to any other obligations the employer has under sections 4.20.2 to 4.23 and 4.28 to 4.30,
>
> (b) when that worker is assigned to work late night hours, the employer must also do one or more of the following:
>
> (i) ensure that the worker is physically separated from the public by a locked door or barrier that prevents physical contact with or access to the worker;
>
> (ii) assign one or more workers to work with the worker during that worker's assignment;
>
> (iii) implement a violence prevention program in accordance with subsections (2.1) to (2.3).

Purpose of guideline
The purpose of this guideline is to provide information about the implementation of the late night retail requirements related to having a second worker or a physical barrier or locked door any time between 11:00 p.m. and 6:00 a.m. (late night hours).

Employers must be in compliance with *Regulation* section 4.22.1(2)(a) - money handling procedures; section 4.21 - procedures for checking on well-being of worker; and all the other Working Alone or In Isolation requirements as well as the Violence in the Workplace requirements. Prevention Officers will ensure compliance with these requirements as part of regular inspection practices.

The remainder of this guideline explains the performance requirements for the barriers and should be used for general information.

Appropriate use of barriers
The requirement under section 4.22.1(2)(b)(i) of the *Regulation* is a performance based requirement. Performance based requirements set expectations for outcomes that must be achieved rather than specific methods of compliance. If an employer chooses to use a barrier or locked door under this section instead of having more than one worker on site, the required outcome is that it must **prevent physical contact with or access to the worker**.

To access the worker means to enter into the worker's workspace. A raised counter that can be climbed over or other controls that merely slow access do not meet the required outcome of preventing access.

Physical contact with the worker means person- to- person contact. Any barrier or locked door must prevent this outcome.

Barriers may be constructed from various materials, including Plexi- glass or Lexan, and be strong enough to withstand reasonable force applied to them. They need not be made of a bullet-resistant material, nor do they need to extend from floor to ceiling, provided that they cannot be climbed over or under. Retractable barriers are acceptable, but the barrier must be in-place during late-night retail hours.

Barriers also must be compliant with applicable building codes, fire codes, and other laws.

A barrier that permits merchandise to be passed through it, such as a transaction window, is acceptable if appropriate engineering controls are in place to prevent a customer from reaching at arm's length into the window to contact a worker reaching at arm's length towards the customer. Some engineering controls to be considered in the design of a barrier include

- A sufficiently narrow width at the opening of the barrier, together with an adequate distance at the opening between the typical location of the worker and that of the customer. Counters and shelving may be installed to increase this distance between the worker and the customer. Where an opening is large enough for a customer's arm to fit through, the distance between the customer and the worker should be two arms' lengths.
- Where the barrier allows for an opening beyond an appropriate width, a means of preventing the opening from widening beyond this width, such as a lock or security bar. The means of release for a lock or security bar needs to be beyond the reach of customers standing outside of the barrier.

Working outside of a barrier during late night hours
The use of a barrier is not intended to prevent workers from performing their regular tasks and duties, such as cleaning up, making coffee, and stocking shelves. The doors to the premises could be locked between the hours of 11:00 p.m. and 6:00 a.m. The worker could perform needed tasks, and with a buzzer system, could be alerted to customers at the door. Once the worker moves behind the barrier, the customers could then safely be buzzed in.

There may be some circumstances which require the worker to move from behind the barrier or locked door to go outside of the building for a short duration. These circumstances should be extremely infrequent and exceptional during a shift. Some examples of these exceptional circumstances include where: the worker's access to the washroom is only from the outside; supplies are required that are located in an adjacent building or storage unit; the worker needs to perform snow removal or another task to ensure the safety of customers.

In these cases, the employer will need to have adequate written procedures for ensuring the safety of the worker while they are outside the building. These procedures should be developed as part of the hazard identification, elimination, and control process, as required by section 4.20.2 of the *Regulation*. Acceptable procedures could include having the worker carry a personal alarm or a phone with an emergency contact button, or requiring the worker to call into a designated person advising when he/she is leaving the building, his/her expected return time, and when he/she has safely returned behind the barrier.

Late night deliveries
The requirement to use a barrier or locked door only applies to workers who are assigned to work alone or in isolation at late night retail premises. Some premises may receive deliveries during late night hours which require the worker to go outside of the locked door or barrier. In these cases, if the delivery person is willing and able to provide the late night retail premises worker with assistance in case of an emergency, injury, or illness, the worker is not considered to be working alone or in isolation. This is only the case for the period of time in which the delivery person is on the premises. During this period of time, the worker is not required to be behind the barrier or locked door.

Employers at late night retail premises wishing to enter into such an arrangement with employers of delivery workers should ensure that the workers of both employers are capable of, and willing to, provide assistance and that the workers are aware of the arrangement. The arrangement should be a written agreement.

G4.22.1-3 Late night retail – Violence Prevention Program

Issued April 15, 2012; Revised July 6, 2012; Editorial Revision December 15, 2017

Regulatory excerpt
Section 4.22.1 of the *OHS Regulation* ("*Regulation*") states:

(1) In this section:

"*late night hours*" means any time between 11:00 p.m. and 6:00 a.m.;

"*late night retail premises*" means

(a) a gas station or other retail fueling outlet, or

(b) a convenience store or any other retail store where goods are sold directly to consumers

that is open to the public for late night hours.

"*violence prevention program*" means a program implemented under subsection (2)(b)(iii).

(2) If a worker is assigned to work alone or in isolation in late night retail premises and there is any risk of harm from a violent act to the worker, then, in addition to any other obligations the employer has under sections 4.20.2 to 4.23 and 4.28 to 4.30,

(a) the employer must develop and implement a written procedure to ensure the worker's safety in handling money, and

(b) when that worker is assigned to work late night hours, the employer must also do one or more of the following:

(i) ensure that the worker is physically separated from the public by a locked door or barrier that prevents physical contact with or access to the worker;

(ii) assign one or more workers to work with the worker during that worker's assignment;

(iii) implement a violence prevention program in accordance with subsections (2.1) to (2.3).

(2.1) A violence prevention program must include procedures, policies and work environment arrangements necessary to ensure that all of the following requirements are met:

(a) there is a time lock safe on the premises that cannot be opened during late night hours;

(b) cash and lottery tickets that are not reasonably required in order to operate during late night hours are stored in the time lock safe referred to in paragraph (a);

(c) there is good visibility both into and out of the premises;

(d) there is limited access to the inside of the premises;

(e) the premises is monitored by video surveillance;

(f) there are signs on the premises, visible to the public, indicating that

(i) the safe on the premises is a time lock safe that cannot be opened during late night hours,

(ii) there is a limited amount of accessible cash and lottery tickets on the premises, and

(iii) the premises is monitored by video surveillance;

(g) a worker described in subsection (2)

(i) is at least 19 years of age, and

(ii) is provided with a personal emergency transmitter that is monitored by

(A) the employer, or

(B) security company or other person designated by the employer.

(2.2) By the end of the first year of the implementation of a violence prevention program and by the end of every second year after that first year, the employer must receive a security audit report, in writing, from an independent qualified person confirming that the program meets all of the requirements under subsection (2.1).

(2.3) The written security audit report referred to in subsection (2.2) must be

(a) retained by the employer, and

(b) posted by the employer in the workplace

for a period beginning on or immediately after the date the report is received and ending no earlier than the date on which the next report is posted.

(3) The employer must train a worker described in subsection (2) in

(a) the written procedure referred to in subsection (2)(a), and

(b) if the employer implements a violence prevention program, the procedures, policies and work environment arrangements referred to in subsection (2.1).

(4) A worker described in subsection (2) must

(a) follow the written procedure referred to in subsection (2)(a), and

(b) if the employer implements a violence prevention program,

(i) follow the procedures, policies and work environment arrangements referred to in subsection (2.1), and

(ii) wear, during late night hours, the personal emergency transmitter referred to in subsection (2.1)(g)(ii).

Section 4.23 of the *Regulation* states:

> The procedures referred to in sections 4.21 and 4.22.1(2)(a) and, if a violence prevention program is implemented, the procedures, policies and work environment arrangements referred to in section 4.22.1(2.1), must be reviewed at least annually, or more frequently if there is
>
> (a) a change in work environment arrangements that could adversely affect
>
> (i) the effectiveness of the violence prevention program, or
>
> (ii) a worker's well-being or safety, or
>
> (b) a report that the procedures, policies or work environment arrangements, as applicable, are not working effectively.

Purpose of guideline
The purpose of this guideline is to provide information about the "third option" available to employers to protect their workers during late night retail operations - the Violence Prevention Program. It includes information about the requirements associated with the program including guidance about the elements of the program, who may be assigned to work late night, the security audit reports required to be performed, and who is qualified to perform the audits.

Background
A third option is available for employers who wish to employ workers in late night retail stores. As an alternative to (or in addition to) having two workers on shift or having a barrier between a single worker and customers, employers may choose to institute a prescribed Violence Prevention Program which must be audited initially within a year of implementation, and then every two years thereafter.

The requirements under this option, and the other options available to employers who operate late night retail stores, are in addition to the other working alone and violence prevention requirements (sections 4.20.1 to 4.23 and sections 4.28 to 4.31) under the *Regulation* with which

employers must comply. These include hazard identification, elimination and control, procedures for checking on workers, and training and instruction of workers on working alone, and violence prevention procedures and policies. The employer is also required to develop and implement a written procedure for a worker's safe handling of money when working late night retail hours (section 4.22.1(2)).

Violence Prevention Program - section 4.22.1(2.1)
A Violence Prevention Program that is implemented as a third option must include the prescribed elements noted in this section. The following provides further information regarding these elements.

Time lock safe - (2.1)(a)
There must be at least one time lock safe on the premises that cannot be opened during late night hours. The purpose of the time lock safe(s) is to hold items such as cash, lottery tickets, and tobacco products that are not required during late night hours (see below).

The time lock safe may be a "drop safe" or a "time delay" safe that cannot be opened by the lone worker during late night retail hours. The time lock safe however may not be a change safe, which a worker would be able to open during late night hours.

A time delay safe, of which there are various designs commonly found in the retail industry, will be acceptable as a time lock safe, providing certain conditions are met.

The time delay safe will be acceptable if

- Time delay is set such that it will not open during late night retail hours, or
- Worker who is working alone during the late night hours is not able to open the time delay safe, and
- Written safe work procedures are developed and implemented

A time delay safe that dispenses limited amounts of cash without the safe opening will also be accepted if,

- Total amount of cash that is dispensed during late night hours, and the time delay setting to dispense the cash, are strictly limited to meet operational needs during those hours, and
- These operational needs have been determined by the employer based on a reasonable assessment of the cash required during late night hours, and
- Written safe work procedures are developed and implemented

Workers are required to be trained on and understand the restrictions and the written safe work procedures under which the time delay safe operate, during the late night hours.

Cash and lottery tickets not reasonably required - (2.1)(b)
The Violence Prevention Program must include procedures to ensure that only cash and lottery tickets reasonably required during late night hours are accessible outside of the time lock safe. The employer should base this determination on an assessment of the customer and sales volumes predicted during the late night hours. For example, the average number of ticket sales between 11 p.m. to 6 a.m., over a two week period could be considered.

Other requirements pertaining to the retailing of tobacco products are covered under the *Tobacco and Vapour Products Control Act* and the Tobacco and Vapour Products Control Regulation (B.C. Reg. 232/2007).

Good visibility both into and out of the premises - (2.1)(c)
This requirement applies to the visibility through existing doors and windows. A worker's sight line to the exterior of the premises should not be obstructed by materials posted on the windows or doors of the store, or by shelving or other facilities within or outside of the store. Similarly, visibility from the exterior into the store should not be obstructed as outlined above or limited by opaque or shaded applications to windows and doors.

Where door and window size, types, and locations appear inadequate, an assessment as part of the environment arrangements to eliminate or minimize the risk to workers may be required under section 4.29 of the *Regulation*.

Limited access to inside of premises - (2.1)(d)
Limited access to the inside of the premises generally means restricting access to the store through one entrance only. Other entrances from outside the premises such as loading bays and emergency doors should be secured. Additional access limitations as applicable to the store's layout should also be considered. For example, where a retail premise is connected with a restaurant, access to the restaurant should be closed if it is not operated during some or all of the late night hours.

Video surveillance monitoring - (2.1)(e)
The premises must be monitored by video surveillance. The configuration of the surveillance set up should include what is necessary to address worker safety in the store. The format of the surveillance system should be such that any incidents of concern are recorded and can be reviewed by the employer and other persons, such as law enforcement officials, as needed.

Signs on premises - (2.1)(f)
There must be signs visible to the public that indicate the following on the premises:

- A time lock safe that cannot be opened during late night hours

- A limited amount of accessible cash and lottery tickets
- Video surveillance monitoring

Signs with similar wording which convey the same message are also acceptable.

Monitored personal emergency transmitter - (2.1)(g)
Several elements of the Violence Prevention Program relate specifically to the worker who is assigned to work alone during late night hours. The worker must be at least 19 years old. In the event that more than one worker is assigned to work late night hours, at least one of these workers must be 19 years of age.

The worker must be provided a personal emergency transmitter that is monitored by the employer, a security company, or other person designated by the employer. This device is in addition to the worker check-in procedures that the employer must have in place for workers working alone section 4.21).

To meet the requirements for having a monitored personal emergency device, the device must be continuously monitored so that assistance can be dispatched in the case of an emergency. The device must have a panic button or other means by which the service provider or employer is immediately alerted to an emergency. Some devices also offer a "person down" feature which will notify when a worker does not move for a given period of time.

The worker must wear the device on their person and the employer must ensure that workers wear the devices as required.

Security audit report - section 4.22.1(2.2)
An employer who chooses to implement a Violence Prevention Program must receive a security audit report by the end of the first year after implementation of the program, and every two years after that. The security audit is a documented inspection to confirm that all program elements under section 4.22.1(2.1) are met. Where employers have more than one operating location, an audit must be conducted at each workplace location. There can be different considerations at individual locations depending on the work environment arrangements and sales volumes that may impact the specific procedures, policies, and work arrangements needed to meet the requirements of the Violence Prevention Program.

The security audit report must be prepared by an independent qualified person. "Qualified" is defined in the *Regulation* (section 1.1) as "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." The qualified person performing the security audit needs to have knowledge and experience with violence prevention procedures, workplace designs, and security and surveillance functions.

An independent person is a person who is not affiliated, related, or closely associated with the employer or the larger controlling unit (e.g., a franchisor). The independent qualified person cannot be employed by the employer or by any provider who developed the Violence Prevention Program or aspects of it for the employer. Employers are expected to exercise due diligence in the selection of the qualified person.

Retention and posting - section 4.22.1(2.3)
The security audit report must be retained by the employer and posted at the workplace for a period starting from when the report is received until when the next report is issued and posted. The report should be posted in an area that is accessible by workers, and may be in an electronic format if all workers have ready access to it.

Training of workers - section 4.22.1(3)
The employer must train a worker who is assigned to work alone in late night retail on the written procedures for handling money safely developed by the employer under section 4.22.1(2), and on all the procedures, policies, and work environment arrangements of the Violence Prevention Program.

Specified worker obligations - section 4.22.1(4)
The requirements under this section place specific obligations on late night retail workers to follow the procedures, policies, and work area arrangements developed by the employer under the Violence Prevention Program and the required written cash handling procedures developed by the employer as required under section 4.22.1(2). There is also a specific obligation imposed on the worker to wear on their person the assigned personal emergency transmitter.

Refer to: G-D3-116 Orders to workers.

Review of procedures - section 4.23
An annual review of the procedures, policies, and work arrangement developed under the Violence Prevention Program (as well as the procedures for checking on workers working alone, and for the safe handling of money) is required. However, a review must also be conducted when it is determined that the procedures in place are not working effectively or where work environment changes are made that may affect the effectiveness of the Violence Prevention Program, or a worker's well-being or safety.

Some examples of changes in work environment arrangements that could prompt a review include construction, renovations, or other changes in a store's design or layout that restrict visibility into and out of the premises, affect video camera sight lines, or otherwise affect the ability of the worker to safely respond to a potentially violent situation. Relevant changes could also include the addition of services or product lines that affect customer and sales volumes, such as the addition of a coffee/food station or cash machine.

Issued February 1, 2008; Revised March 27, 2008; Revised August 18, 2008; Formerly Issued in G4.22.2 - Reissued as G4.22.2-1 September 22, 2008

Regulatory excerpt
Section 4.22.2 of the *OHS Regulation* ("*Regulation*") states:

> An employer must require that customers prepay for fuel sold in gas stations and other retail fueling outlets.

Purpose of guideline
The purpose of this guideline is to clarify who is covered by this section and set out some alternatives for providing prepayment for customers.

Application
The prepayment requirement applies 24 hours a day, seven days a week. The requirement applies to both full service and self service stations. The requirement applies regardless of the number of workers assigned and working at any given time at the worksite.

The prepayment requirement only applies to vehicle fuel. Fuel is considered to be products such as gasoline, propane, and diesel. The prepayment requirement does not apply to fuel being pumped into containers. For example, customers do not need to prepay for propane being pumped into a cylinder (e.g., for barbeques), or for pre-filled propane cylinders.

"Other retail fueling outlets" include convenience stores that dispense fuel. However, the requirements of section 4.22.2 are not intended to apply to marine fueling stations that use boat access to the fueling location. The risk of injury to a worker in a marine "gas and dash" situation is not as significant.

Methods of Prepayment
Pay at the pump
Where available, customers can prepay for fuel by swiping their credit or debit cards before fueling to preauthorize their purchase at the pump. As practices may differ regarding how preauthorization occurs on such transactions at the pump, customers are encouraged to discuss any concerns about retail fuel prepayment transactions directly with their financial institution and credit card companies.

At gas kiosk/in store
Customers may prepay by cash, credit card, or debit card with an attendant at a payment kiosk or with the clerk in the store. The payment transaction is completed before fueling commences. The customer will determine the amount of fuel to be purchased, then immediately pay the cash, or complete the credit card or debit card transaction. Optimally, the gas pumps can then be set to authorize fueling to the prepaid amount only.

This option will be preferred by customers who wish to keep their credit and debit cards within their sight and control.

Providing credit and debit cards
Customers may also prepay by leaving a credit card or debit card with the gas attendant or with the clerk in the store before fueling. After fueling, the payment transaction is completed. The attendant or clerk will put through the amount fueled on the credit card and the customer will sign the receipt. Where a debit card is used, the customer will complete the transaction by authorizing the withdrawal through the usual PIN (personal identification number) and account selection process.

This option will not suit customers with concerns about relinquishing control of their cards.

Cardlock systems
Finally, a customer may make a payment using a cardlock system, typically used by the commercial trucking industry.

Upgrading equipment
Employers should consult with their equipment distributor/service provider to ensure their point of sales software, valves, nozzles, and other equipment is capable of safely operating in a prepay mode.

G4.22.2-2 Alternative methods for fuel prepayment outside of urban centres

Issued February 1, 2008; Revised March 27, 2008; Revised August 18, 2008; Formerly Issued in G4.22.2 - Reissued as G4.22.2-2 September 22, 2008

Regulatory excerpt
Section 4.22.2 of the *OHS Regulation* ("*Regulation*") states:

> An employer must require that customers prepay for fuel sold in gas stations and other retail fueling outlets.

Purpose of guideline
The purpose of this guideline is to clarify WorkSafeBC's expectations for fuel payment in small, rural or remote locations outside of urban centres, where implementing one or more of the above methods of fuel prepayment poses particular difficulties to an employer, and where payment for fuel can be secured by an alternative method. Where alternative methods prove to be appropriate, the employer, not the customer, has the discretion to determine if these methods will be used at their workplace.

Determining when alternatives may be used
A number of factors should be considered in determining if an alternative secured payment method is appropriate for a particular gas station. First, alternative payment methods should be considered only for stations in small, rural or remote locations, outside of urban centres, particularly outside the lower mainland. Next, the employer will have considered implementing one of the methods of prepayment noted in G4.22.2-1, but found challenges in doing so. Usually these challenges will relate to some special circumstances associated with the station being located in the small, rural or remote area. Finally, the number of customers that are known to the employer and their workers will generally be relevant in determining if, and what type of, alternative secured payment method should be used. As these considerations will vary considerably from station to station, a prevention officer can assist an employer with the determination.

Alternative methods
The following are acceptable alternative methods of securing payment for fuel in appropriate locations.

Standing accounts
Where the gas station employer and their workers are familiar with many of their customers who do not pose "gas and dash hazards," the retailer and customer may make alternative arrangements for paying for fuel. For example, they may have a standing account where future payment is arranged by agreement, or they may establish a "known customer" list for customers who may pay the attendant on each transaction after fuel has been pumped.

Leaving a means of securing payment: car keys or driver's licence
Gas station attendants may request that customers provide their car keys or a driver's licence to secure payment for the fuel that will be pumped. The attendant should verify that the driver's licence or keys are that of the customer.

G4.81/4.82 Controlling exposure to environmental tobacco smoke (ETS) and e-cigarette vapour

Issued March 28, 2002; Revised May 1, 2002; Editorial Revision October 2004; Revised March 31, 2008; Revised June 18, 2008; Revised January 1, 2009; Revised May 12, 2009; Preliminary Revision September 1, 2016; Revised consequential to May 1, 2017 Regulatory Amendment; Revised October 30, 2018 consequential to the enactment of the *Cannabis Control and Licensing Act*

Regulatory excerpt
Section 4.80.1 of the *OHS Regulation* ("*Regulation*") states:

> In sections 4.81 and 4.82, "activated e-cigarette", "e-cigarette" and "tobacco" have the same meaning as in the *Tobacco and Vapour Products Control Act*.

Sections 4.81(a) and 4.82 of the *Regulation* state:

> #### 4.81 Controlling exposure
>
> Subject to section 2.41 of the *Tobacco and Vapour Products Control Act* and section 4.23(2)(c) of the Tobacco and Vapour Products Control Regulation, an employer must control the exposure of workers to environmental tobacco smoke and e-cigarette vapour at a workplace by doing all of the following:
>
> (a) prohibiting the following activities in the workplace:
>
> (i) smoking tobacco;
>
> (ii) holding lighted tobacco;
>
> (iii) using an e-cigarette;
>
> (iv) holding an activated e-cigarette;
>
> …
>
> #### 4.82 Exceptions
>
> (1) An employer must ensure that a worker does not work in an indoor area where the activities referred to in section 4.81(a) are permitted under section 4.23(2)(a) or (b) of the Tobacco and Vapour Products Control Regulation unless
>
> (a) the worker must enter the area to respond to an emergency endangering life, health or property,
>
> (b) the worker must enter the area to investigate for illegal activity, or
>
> (c) the tobacco smoke or e-cigarette vapour has been effectively removed.
>
> (2) If necessary to prevent tobacco smoke or e-cigarette vapour from entering a workplace, a room where the activities referred to in section 4.81(a) are permitted under section 4.23(2)(a) of the Tobacco and Vapour Products Control Regulation must be provided with a separate, non-recirculating exhaust ventilation system that

(a) is designed in accordance with expected occupancy rates,

(b) maintains adequate air flows from areas in which smoking tobacco or using activated e-cigarettes is prohibited to areas in which smoking tobacco or using activated e-cigarettes is permitted,

(c) discharges directly to the outdoors, and

(d) meets all other requirements, specified in the *American Society of Heating, Refrigerating and Air-conditioning Engineers Standard 62-1989, Ventilation for Acceptable Indoor Air Quality*, for a lounge in which smoking tobacco or using activated e-cigarettes is permitted.

As of September 1, 2016, changes to the *Tobacco Control Act* and Tobacco Control Regulation, now called the *Tobacco and Vapour Products Control Act* (*TVPCA*) and the Tobacco and Vapour Products Control Regulation (TVPCR) came into force.

Two significant changes are as follows:

- In addition to tobacco smoking or holding lighted tobacco, the prohibited activities in proximity to a doorway, window, or air intake of an indoor workplace have been expanded to include use of an e-cigarette or holding an activated e-cigarette.
- The prescribed distance restricting prohibited activities from a doorway, window, or air intake of an indoor workplace has been increased from 3 metres to 6 metres.

WorkSafeBC does not directly enforce the requirements of the *TVPCA* or TVPCR. However, sections 4.81 and 4.82 of the *Regulation* have been amended to align with the *TVPCA* and TVPCR. The *Cannabis Control and Licensing Act* (*CCLA*) which came into force October 17, 2018 sets out requirements to control exposure to environmental cannabis smoke and e-cigarette vapour in much the same way as the TVPCA does for tobacco. However, as sections 4.81 and 4.82 of the *Regulation* have not yet been amended to include cannabis and align with the *CCLA*, these sections cannot be used to deal with a cannabis-related workplace complaint. Prohibitions on cannabis smoking and vaping in the workplace are currently included in the *CCLA*. It is expected that *CCLA* enforcement will be carried out by the director of the *CCLA* and also by the enforcement officers who deal with tobacco and liquor violations (e.g., police officers, park rangers, park wardens, and tobacco enforcement officers).

Purpose of guideline
This guideline provides an overview of sections 4.81, 4.82, and related requirements of the *Regulation* that control smoking and the use of e-cigarettes in the workplace, in the context of the provincial *TVPCA* and TVPCR which came into effect on September 1, 2016.

Requirements of the *Regulation*
For the purposes of this guideline, e-cigarette vapour is the vapour produced by an activated e-cigarette.

1. Application of the *Regulation* ETS and E-Cigarette Vapour Requirements
The basic requirements for controlling worker exposure to tobacco smoke and e-cigarette vapour are found in sections 4.81 and 4.82 of the *Regulation*.

Section 4.81(b) of the *Regulation* restricts tobacco smoking and e-cigarette vapour to a safe outdoor location that is a minimum of 6 metres from a doorway, window, or air intake of an indoor workplace, subject to an exception addressing patios. Section 4.22(1) of the *TVPCR* increased this prescribed distance from 3 metres to 6 metres.

Section 4.81 establishes the basic framework for controlling exposure by prohibiting smoking and e-cigarette use in the workplace, restricting those activities to a safe outdoor location or, in certain circumstances, prohibiting work in an indoor area where smoking or e-cigarette use is permitted. In turn, section 4.82(1) provides the exceptional circumstances where a worker may work in an indoor area where smoking and e-cigarette use is permitted under the *TVPCA*.

Section 4.82(2) lays out the requirements necessary to prevent tobacco smoke and e-cigarette vapour from entering a workplace for the cases where smoking or the use of e-cigarettes is permitted under the TVPCA. These obligations for the design and operation of indoor designated smoking areas apply where smoking or e-cigarette use is permitted under the *TVPCA* (for example, for residents in community care facilities and for certain motel/hotel rooms). Workers must not enter such areas except as permitted by section 4.82(1).

The requirements of sections 4.81 and 4.82 are intended to prevent workers from being exposed to airborne tobacco smoke and e-cigarette vapour at work. They do not apply to the non-airborne components of ETS, such as tar residues, or to the odour associated with a designated smoking area, which may remain after ETS or e-cigarette vapour has dissipated from the air.

Other requirements of the* Regulation *on smoking: There are a number of requirements in the *Regulation* that explicitly or otherwise have the effect of prohibiting smoking, whether indoors or outdoors. Examples of these provisions are shown in Table 1 below.

Table 1: Some other provisions that control smoking		
Part	Section	
Chemical Agents and Biological Agents	5.27(1), (2) 5.84	Ignition sources Prohibition
Substance Specific Requirements	6.56	Personal hygiene

Blasting Operations	21.40(1)	Ignition sources prohibited
Underground Workings	22.40(b) 22.154	Battery charging stations No smoking
Oil and Gas	23.7(1)	Fire hazards
Laboratories	30.17(2)	Personal protection

WorkSafeBC prevention officers will apply other provisions of the *Regulation* that control smoking in the workplace, such as those outlined in Table 1, as well as requirements in Part 4 (General conditions) of the *Regulation* on indoor ventilation, where related to the issue of smoking. For example, under section 4.72 (Design and operation) of the *Regulation*, indoor ventilation systems must be operated in a manner that meet criteria including provision of an adequate supply of outdoor air. Typically this will mean keeping air intakes open. The *TVPCR* permits smoking and e-cigarette use on a patio of a hospitality establishment under certain conditions, including closure of any air intake that is mounted in the wall between the patio and the indoor area of the facility. The employer needs to comply with both sets of requirements, and has the option of either prohibiting smoking and e-cigarette use on the patio or moving the air intake away from it.

2. Requirements of the provincial *TVPCA* and TVPCR

The Province of British Columbia has enacted provisions, under the auspices of the Minister of Health, to control smoking and e-cigarette use under the *TVPCA*, which became effective September 1, 2016. Each regional health authority has tobacco enforcement officers who are responsible for enforcement of the *TVPCA* and TVPCR. Some of the main provisions are outlined below - additional information about the *TVPCA* and TVPCR is available at http://www2.gov.bc.ca/gov/content/health/keeping-bc-healthy-safe/tobacco-vapour).

- In workplaces and public spaces which are "fully or substantially enclosed," smoking and e-cigarette use is prohibited. These workplaces and public spaces include offices, industrial establishments, restaurants, bars, pubs, night clubs, and bingo halls. The prohibition also applies to all vehicles used for business purposes, such as buses, taxis, and work or commercial trucks. In addition, it applies to a workplace located in a private dwelling during any period in which a person performs services in return for compensation.
- A place is "fully or substantially enclosed" if it has a roof or other covering, and more than 50% of the nominal wall space is enclosed by any material that does not permit air to flow easily through it. The "nominal wall space" is the area determined by calculating the length, in metres of the perimeter of the building, structure, vehicle, or place, and multiplying it by 2.7 metres. (Note: Ministry of Health officials advise that the nominal wall space concept is best applied to walls that are more than 2.7 metres high, when covered by a roof.)
- Smoking and using an e-cigarette are also prohibited in transit shelters, and in common areas of apartment buildings, condominiums, and dormitories.
- Exemptions from the prohibition on smoking or use of e-cigarettes indoors have been made for the following:
  - A person who is in care or a resident in a community care facility, assisted living residence, or hospital, who may smoke or use an e-cigarette in a room designated for smoking by the facility
  - A person who is registered as a hotel/motel guest who may smoke or use an e-cigarette in the room or building in which the guest and the guest's party, if any, have been assigned exclusive accommodation
  - The ceremonial use of tobacco by Aboriginal people
  - Subject to certain requirements set out in the TVPCR, a retailer who sells or distributes vapour products
- For patios used in conjunction with a public place such as a restaurant, bar, casino, or bingo hall, smoking and e-cigarette use is permitted only if all the following conditions apply:
  - The predominant use of the public place is to sell food or beverages or both, or as a casino or bingo hall
  - Any doorway between the public place and the patio is closed at all times while the patio is in use except when someone is passing through it
  - Any window or air intake between the patio and the public place is closed at all times when the patio is in use
  - The patio is not fully or substantially enclosed. (Note: Ministry of Health officials advise that where a patio has a roof over only part of it, then for the purposes of applying the test of full or substantial enclosure, the patio can be considered to have two sections, one with a roof over it and one without) (Refer to guideline *G4.81(b) Safe outdoor location*)

G4.81(b) Safe outdoor location

Issued March 28, 2002; Revised May 1, 2002; Editorial Revision March 2005; Revised March 31, 2008; Editorial Revision June 18, 2008; Formerly Issued as part of G4.82(1) and (2) - Re-issued as G4.81(b) January 1, 2009; Revised September 1, 2016; Revised consequential to May 1, 2017 Regulatory Amendment; Revised October 30, 2018 consequential to the enactment of the *Cannabis Control and Licensing Act*

Regulatory excerpt

Section 4.81(b) of the *OHS Regulation* ("*Regulation*") states:

> Subject to section 2.41 of the *Tobacco and Vapour Products Control Act* and section 4.23(2)(c) of the Tobacco and Vapour Products Control Regulation, an employer must control the exposure of workers to environmental tobacco smoke and e-cigarette vapour at a workplace by doing all of the following:
>
> (b) subject to section 4.22(3) of the Tobacco and Vapour Products Control Regulation, restricting the activities referred to in paragraph (a) of this section to a safe outdoor location that is a minimum of 6 m from a doorway, window or air intake of an indoor workplace;

As of September 1, 2016, changes to the *Tobacco Control Act* and Tobacco Control Regulation, now called the *Tobacco and Vapour*

Products Control Act (*TVPCA*) and the Tobacco and Vapour Control Regulation (TVPCR) came into force.

Two significant changes are as follows:

- In addition to tobacco smoking or holding lighted tobacco, the prohibited activities in proximity to a doorway, window, or air intake of an indoor workplace have been expanded to include use of an e-cigarette or holding an activated e-cigarette.
- The prescribed distance restricting prohibited activities from a doorway, window, or air intake of an indoor workplace from 3 metres to 6 metres.

WorkSafeBC does not directly enforce the requirements of the *TVPCA* or TVPCR. However, sections 4.81 and 4.82 of the *Regulation* have been amended to align with the *TVPCA* and TVPCR. The *Cannabis Control and Licensing Act* (*CCLA*) which came into force October 17, 2018 sets out requirements to control exposure to environmental cannabis smoke and e-cigarette vapour in much the same way as the TVPCA does for tobacco. However, as sections 4.81 and 4.82 of the *Regulation* have not yet been amended to include cannabis and align with the *CCLA*, these sections cannot be used to deal with a cannabis-related workplace complaint. Prohibitions on cannabis smoking and vaping in the workplace are currently included in the *CCLA*. It is expected that *CCLA* enforcement will be carried out by the director of the *CCLA* and also by the enforcement officers who deal with tobacco and liquor violations (e.g., police officers, park rangers, park wardens, and tobacco enforcement officers).

Purpose of guideline
This guideline discusses what is meant by a "safe outdoor location."

Safe outdoor location
Section 4.81(b) of the *Regulation* restricts environmental tobacco smoke (ETS) and e-cigarette use to a safe outdoor location that is a minimum of 6 metres from a doorway, window, or air intake of an indoor workplace, subject to an exception addressing patios. This is consistent with the restriction set out in section 4.22(1) of the TVPCR.

For the purposes of section 4.81(b), "safe outdoor location" refers to a location that is safe with regard to any of the hazards identified in the *Regulation*. For example, such a location will have a safe means of access and egress, will not expose users to vehicle traffic, and will be clear of any flammable materials. The potential for hazards such as cold stress should also be considered. There is no obligation under this section for the employer to provide amenities such as canopies or seating for worker comfort, although the employer may do so.

The safe outdoor location should be arranged or located in such a way that smoke or e-cigarette vapour from the outdoor area does not readily enter any indoor work area; for example, through a doorway, window, or air intake. (Note: Provincial and applicable Municipal legislation specify various minimum distances from such portals.)

Typically, the outdoor location may be a ground surface, floor, or deck area; and a roof or awning may cover it. Any structure, including a temporary structure, such as a tent that significantly obstructs the movement of air, may bring the area within the meaning of an indoor area. For example, an area that has natural airflow obstructed on more than two sides by the presence of windbreaks, such as walls, fences, or other adjacent structures or objects, may be deemed to be indoors for the purpose of this section. Low-height walls (half-height or less) or chain-link fencing or similar open structures that minimally obstruct airflow will normally not be considered as a windbreak.

While the above information describes a typical configuration for a safe outdoor location, an employer may choose another design that minimally obstructs natural airflow and does not allow the accumulation of ETS or e-cigarette vapour. For example, a freestanding, gazebo-type structure, with a roof and a low-height wall that surrounds all sides of the seating area, may be acceptable. A very narrow type of structure with wind breaks on three sides, but with large openings at top and bottom on all sides, may also be effective at preventing ETS or e-cigarette vapour accumulation. Note that the configuration of an outdoor area will need to work in a variety of atmospheric conditions - for example, from calm to windy days.

G4.82(1) Entry into indoor areas where smoking and e-cigarette use is permitted

Formerly Issued as part of G4.82(1) and (2), and G4.82(3) - Re-issued as G4.82(1) January 1, 2009; Editorial Amendment October 22, 2010; Preliminary Revision September 1, 2016; Revised consequential to May 1, 2017 Regulatory Amendment; Revised October 30, 2018 consequential to the enactment of the *Cannabis Control and Licensing Act*

Regulatory excerpt
Section 4.82(1) of the *OHS Regulation* ("*Regulation*") states:

> An employer must ensure that a worker does not work in an indoor area where the activities referred to in section 4.81(a) are permitted under section 4.23(2)(a) or (b) of the Tobacco and Vapour Products Control Regulation unless
>
> (a) the worker must enter the area to respond to an emergency endangering life, health or property,
>
> (b) the worker must enter the area to investigate for illegal activity, or
>
> (c) the tobacco smoke or e-cigarette vapour has been effectively removed.

As of September 1, 2016, changes to the *Tobacco Control Act* and Tobacco Control Regulation, now called the *Tobacco and Vapour Products Control Act* (*TVPCA*) and the Tobacco and Vapour Control Regulation (TVPCR) came into force.

Two significant changes are as follows:

- In addition to tobacco smoking or holding lighted tobacco, the prohibited activities in proximity to a doorway, window, or air intake of an indoor workplace have been expanded to include use of an e-cigarette or holding an activated e-cigarette.
- The prescribed distance restricting prohibited activities from a doorway, window, or air intake of an indoor workplace has been increased from 3 metres to 6 metres.

WorkSafeBC does not directly enforce the requirements of the *TVPCA* or TVPCR. However, sections 4.81 and 4.82 of the *Regulation* have been amended to align with the *TVPCA* and TVPCR. The *Cannabis Control and Licensing Act* (*CCLA*) which came into force October 17, 2018 sets out requirements to control exposure to environmental cannabis smoke and e-cigarette vapour in much the same way as the TVPCA does for tobacco. However, as sections 4.81 and 4.82 of the *Regulation* have not yet been amended to include cannabis and align with the *CCLA*, these sections cannot be used to deal with a cannabis-related workplace complaint. Prohibitions on cannabis smoking and vaping in the workplace are currently included in the *CCLA*. It is expected that *CCLA* enforcement will be carried out by the director of the *CCLA* and also by the enforcement officers who deal with tobacco and liquor violations (e.g., police officers, park rangers, park wardens, and tobacco enforcement officers).

Purpose of guideline
This guideline

- Notes the circumstances where smoking or using an e-cigarette indoors is permitted under the *TVPCA* and TVPCR)
- Discusses circumstances under *Regulation* section 4.82(1) in which a worker may enter an indoor area where smoking is permitted under the TVPCR
- Provides detailed information on what needs to be done to clear indoor air of environmental tobacco smoke (ETS)
- Provides a strategy for home care service providers to consider to help ensure worker safety in the circumstances where the occupant(s) are cannabis or tobacco smokers or use e-cigarettes
- Discusses control measures for entry in the event of emergencies or investigation of illegal activities

For the purposes of this guideline, e-cigarette vapour is the vapour produced by an activated e-cigarette.

Indoor locations where smoking or use of e-cigarettes indoors is permitted
Under the provisions of the *TVPCA* and section 4.23(2) of the TVPCR, smoking or use of an e-cigarette indoors is only permitted in the following circumstances (note that no such permisions are included in the *CCLA*):

- A person who is in care or a resident in a community care facility, assisted living residence, or hospital, who may smoke or use an e-cigarette in a room designated for smoking by the facility
- A person who is registered as a hotel/motel guest who may smoke or use an e-cigarette in the room or building in which the guest and the guest's party, if any, have been assigned exclusive accommodation
- Subject to specific circumstances, a person who uses an e-cigarette or holds an activated e-cigarette within the premises at which a retailer deals in, sells, offers to sell or distributes vapour products
- The ceremonial use of tobacco by Aboriginal people

Also, the *CCLA*, *TVPCA,* and TVPCR do not apply to a private dwelling, except during the times when a person performs services in the dwelling in return for compensation; thus they permit smoking tobacco or cannabis, or the use of an e-cigarette prior to the worker's entry.

Worker entry into an indoor area where smoking or the use of an e-cigarette is permitted
In a situation where smoking or the use of an e-cigarette is permitted by the *TVPCA*, *Regulation* section 4.82(1) permits a worker to enter the area only in the following three circumstances where:

- The worker must enter the indoor area to respond to an emergency endangering life, health, or property
- The worker must enter the indoor area to investigate for illegal activity
- The tobacco smoke or e-cigarette vapour has been effectively removed

Entry in the event of emergencies or investigation of illegal activities
Sections 4.82(1)(a) and (b) are intended to permit one or more workers to quickly respond to an investigation for illegal activities or an emergency of a magnitude that outweighs the risk to the worker resulting from short-term exposure to ETS or e-cigarette vapour. Exposure to ETS or e-cigarette vapour is not typically an immediate danger to life or health. Entry in these cases may be for reasons such as the following:

- An occupant may require immediate attention by a medical practitioner, caregiver, or first aid attendant
- Activation of a fire alarm may result in the need for workers to enter a room designated for tobacco use to locate the source of the problem
- A mechanical system failure, such as a ruptured water pipe, inside a room designated for tobacco use may require immediate attention
- A serious accident or incident may require immediate investigation
- A hazard that poses a serious risk to workers or others may require immediate attention
- Illegal activity may necessitate immediate access by an appropriate regulatory authority for the purpose of collecting evidence or otherwise discharging their statutory duties

If it is necessary for workers to enter an indoor area in these circumstances, the exhaust ventilation system should, when practicable, remain in operation while they are inside and smoking or use of e-cigarettes should not be allowed. Workers should minimize the time spent in the area if there is residual exposure to ETS or e-cigarette vapour. In order to achieve these outcomes, it is important that employers review their emergency

entry plans with staff and train them accordingly.

Effective removal of tobacco smoke
As a result of *Regulation* section 4.82(1), except in the rare situation of an emergency or an investigation for an illegal activity, the employer cannot assign or allow work duties that would require a worker to enter an indoor area where smoking or e-cigarette use is taking place or if ETS or e-cigarette vapour has not been effectively removed.

The question for employers and entry workers is: when is it safe to enter a room after smoking has stopped?

The following information is provided for three circumstances: a room designated for tobacco use meant for multiple smokers in a community care facility, assisted living residence, or hospital; a hotel room; and a private dwelling. The information is based on general principles of exhaust ventilation and estimations of time required for evacuation of air within a defined space.

1. Rooms designated for tobacco use
As per *Regulation* section 4.82(2)(1), if necessary to prevent tobacco smoke from entering a workplace, a room designated for tobacco use within a community care facility, assisted living residence, or hospital must be provided with a separate, non-recirculating exhaust ventilation system that meets the following requirements:

- Is designed in accordance with expected occupancy rates.
- Maintains adequate air flows from non-smoking to smoking areas. A minimum of 60 cfm (0.03 cubic metres per second) per person of outside air needs to be supplied to the room, and at least 70 feet per minute air velocity must be maintained through wall openings.
- Discharges directly to the outdoors.

The tobacco smoke load in a designated room can be substantial when a number of smokers are present at the same time. As a guide, before a worker is allowed to enter the designated room, the air of the room should be allowed to experience a minimum of four air changes following cessation of smoking. This will remove about 94% of the original load providing the layout of the room allows good ventilation flow-through and the effectiveness of the exhaust ventilation system is not compromised by problems such as short-circuiting. Note that each subsequent air change results in only marginal improvement in air quality. It is estimated it would take another three air changes to achieve 99% removal of contaminants.

Note: Information pertaining to ETS and ETS-free areas can also be found in clause 5.18 of *ANSI/ASHRAE Standard 62.1-2007 Ventilation for Acceptable Indoor Air Quality*.

2. Hotel guestrooms
The *Hotel Guest Registration Act* defines "hotel" as including an inn or building in which private rooms are maintained for the accommodation of the public. The tobacco smoke load for hotel guestrooms will likely be less than for a typical room designated for tobacco use since typically only one or two persons utilize a typical hotel guestroom, and for a relatively short duration. As a result, due to the significantly lower initial tobacco smoke load, two air changes after cessation of smoking prior to entry of the worker is considered reasonable.

Note: ETS from hotel guestrooms should not migrate to worker-frequented areas. A guestroom in which smoking is allowed needs to be provided with a dedicated exhaust system to prevent recirculation of ETS-contaminated air through the general heating or HVAC system, and the room needs to be maintained under negative pressure relative to adjacent, worker-frequented areas such as hallways. If these requirements cannot be met, a "no smoking" status needs to be assigned to the guestroom.

Note: Information pertaining to ETS and ETS-free areas can also be found in clause 5.18 of *ANSI/ASHRAE Standard 62.1-2007 Ventilation for Acceptable Indoor Air Quality*.

3. Protecting home care service workers from ETS, cannabis smoke, and e-cigarette vapour:
The *TVPCA, CCLA*, and the *Regulation* do not apply to a private dwelling, except during the times when a person performs services in the dwelling in return for compensation. Examples of such services include home care, appliance repair, home cleaning, and real estate services. Home care service work is a particular concern given that services are often provided on a repetitive basis, and in close proximity to the occupant of the dwelling. The *Regulation* does not prohibit tobacco or cannabis smoking or e-cigarette use prior to the worker's entry.

The home care service employer must ensure that measures are taken to protect these workers from exposure to ETS, cannabis smoke, and e-cigarette vapour. This can be achieved through a written agreement drawn with the employer and the client and/or the owner of the residence, outlining the measures and conditions that will be required to be in place before the home care worker can enter the residence. The agreement should cover the following:

1. The obligation to prohibit smoking or e-cigarette use inside the residence for at least 1 (one) hour before the home care worker commences his or her duties. Where exhaust fans are available in a residence, such as those found in kitchens or bathrooms, it is important to ensure at least one fan is operated during this time, provided it does not result in uncomfortable cooling. Persons wishing to smoke can do so outdoors during this period of time while the worker is in the residence.
2. If prohibiting smoking or e-cigarette use or going outside is not practicable, the agreement should restrict smoking or e-cigarette use to a room that is provided with an exhaust fan. The worker will not enter this room. This restriction would begin one hour before the worker's arrival and be maintained while the worker is in the residence.
3. When a worker arrives at the residence and finds the client and/or the owner has not respected the agreement regarding smoking or use of e-cigarettes, the worker can do the following:
    - Arrange to reschedule the visit for another time when the client or owner of the residence will respect the agreement. The worker would report the incident to the supervisor or employer.

- If it is not practicable at the time of visit to reschedule to a later time (such as in situations where there is an urgent need of care), the worker would insist that smoking and/or e-cigarette use be prohibited while in the home and would advise the client and/or owner that further service may be not be undertaken if the client and/or owner of the residence does not comply with the agreement. The worker would report the incident to the supervisor or employer.

  Note: This exception would apply only to workers that are not at undue risk due to a pre-existing medical condition. It is not appropriate for an immunologically compromised worker to enter the residence in these circumstances.

If it turns out that the client or owner consistently violates the contractual agreement, then the employer is in a position to suspend provision of services or cancel the contract.

G4.79 Moulds and indoor air quality

Issued June 14, 2002; Revised February 8, 2007

Regulatory excerpt
Section 4.79(1) of the *OHS Regulation* ("*Regulation*") states in part:

> The employer must ensure that the indoor air quality is investigated when
>
> (a) complaints are reported…

Section 4.79(2) states in part:

> An air quality investigation must include…
>
> (c) sampling for airborne contaminants suspected to be present in concentrations associated with the reported complaints…

Section 3.10 states:

> Whenever a person observes what appears to be an unsafe or harmful condition or act the person must report it as soon as possible to a supervisor or to the employer, and the person receiving the report must investigate the reported unsafe condition or act and must ensure that any necessary corrective action is taken without delay.

Purpose of guideline
This guideline discusses the application of the *Regulation* to workplaces with mould showing on exposed or hidden surfaces, or where mould may be a factor in complaints regarding indoor air quality. The guideline provides information for investigating indoor air quality complaints with respect to mould contamination, including information on sampling for the presence of moulds in buildings. Information is also provided on possible health effects and for cleanup personnel involved in the remediation of buildings damaged by water and mould.

The presence of mould should be suspected if there is visible moisture (condensation) on building surfaces or if there has been water damage, for example, due to roof or wall leaks, plumbing failures, or flooding. Workers who occupy damp or water-damaged buildings and workers involved in the remediation of water-damaged buildings may be exposed to mould. The presence of moulds may also result in complaints from workers about poor air quality in the building, such as a musty odour. These complaints require an investigation by the employer (*Regulation* sections 3.10 and 4.79(1)). In order to establish whether there is a potential for worker exposure to mould, a risk assessment must be carried out. Some basic principles are outlined in this guideline, including precautionary measures that need to be considered in order to minimize the potential for worker exposure.

Note: Public exposure to moulds. WorkSafeBC applies the *Regulation* to protect workers under its jurisdiction from the adverse health effects of exposure to moulds. While public exposure is not within its jurisdiction, WorkSafeBC cooperates with other agencies, such as public health authorities and the Canada Mortgage and Housing Corporation, in finding solutions to the problems of mould contamination.

Conditions for mould growth
Moulds are part of the fungi kingdom and serve an important role in breaking down organic matter. They are found both outdoors and indoors. Fungi can form a colony, which is a visible mass of interwoven filaments that may appear cottony, velvety, granular, or leathery. Fungi can be any colour but usually will appear as a shade of white, grey, brown, yellow, or green. The fungi most commonly found growing indoors are often called "moulds" (for example, species of *Penicillium, Aspergillus,* and *Cladosporium*). For the purposes of this guideline, the terms "mould," "mildew," and "fungus or fungi" are interchangeable.

Moulds spread naturally through the release of spores into the air. Any air movement will cause the dry spores to be carried with the air current; eventually the spores will land on a surface. Moulds may also spread through direct mechanical transfer of mould-covered materials, or by a person or animal brushing against a mould and then depositing some mould on another surface. Once a colony of mould is established and subsequently disturbed or damaged, spores may become airborne and spread throughout the building.

As long as moisture and nutrients are present, mould growth will usually continue unabated. Moulds are likely to grow where there is water or prolonged dampness – such as in bathrooms, basements, water-damaged walls, ceiling/roofing material, and the damp parts of refrigeration or air conditioning systems (for example, air chillers or drip trays). A source of nutrients for mould is basically any organic material and can include simple

sugars and starches as well as more complex carbon-containing substances such as paper and wood. Many porous building materials such as drywall, wallboard, wallpaper, insulation, ceiling tile, and wood contain organic material.

Without moisture, mould cannot grow or reproduce and will die or enter a dormant stage. In the case of some moulds, this dormant stage can last for years. However, given the right conditions, such as a water or moisture supply, the mould can become active (start growing again) and release spores.

Health effects of exposure to moulds
A person's exposure to moulds is primarily through inhalation of airborne spores. For most people, exposure to mould does not result in any significant health effects. Most of the health complaints reported are upper respiratory in nature, such as coughing, itchy eyes, stuffy nose, sneezing, and sore throat. However, mould exposure in water-damaged buildings has also been linked to the development of asthma in both children and adults.

For a person who has a compromised or sensitized immune system, health effects can be severe. Some moulds are infectious (pathogenic) and others produce chemical by-products or mycotoxins (toxigenic agents). For those individuals with compromised or sensitized immune systems, exposure to pathogenic moulds or their toxic by-products may be associated with a variety of adverse health effects, including allergic reactions, asthma, pneumonitis with flu-like symptoms, infections of the upper airways, sinusitis, or other lung diseases.

Section 4.79 requires an investigation of a worker's complaint related to indoor air quality. However, there are currently no exposure limits or standardized risk assessment procedures to accurately predict a worker's health risk from mould exposure. Nor is there at present a standardized protocol for sampling of these organisms, although a number of methods are currently used.

Investigation of mould contamination
The extent of mould contamination can be determined in two ways. The primary method is through a visual assessment to establish the presence of mould and the extent (area) of growth. This could include an intrusive investigation for the presence of hidden mould.

The secondary method is via air sampling to establish the presence and types of mould spores in the air. Trained individuals are required to identify the presence of specific types of mould and to carry out representative sampling. Also, microscopic identification of the spores and mould colonies requires considerable expertise, and these services are not routinely available from commercial laboratories. For someone with limited experience, sampling results are difficult to interpret. Experience in interpretation of results is essential.

Visual assessment
The presence and extent of visible growth of mould can be checked by direct observation and measuring the area of coverage. It may be necessary to cut access holes or use equipment such as a borescope (an instrument that uses optical fibres for the visual inspection of hard to reach spaces) to view spaces in ventilation ductwork or inside wall cavities to check for hidden sources of mould and the extent of water damage. Once the area of mould coverage has been determined, Table 1 can be used to categorize the problem and determine the level of controls recommended to control spores and mould dispersion.

Note: Any disturbance of a mould source, for sampling, should not be conducted without taking some precautions. The precautions listed under "Small" in Table 1 should be adequate.

Section 4.78(2) of the *Regulation* requires regular inspection of ventilation systems for conditions that could promote the growth of micro-organisms – conditions such as water leaks and stagnant water pools - along with correction of any deficiencies found. This action is required whether or not there are reports or complaints regarding indoor air quality.

Bulk or surface sampling
If it is necessary to determine the type of mould, a small sample can be taken by scraping some visible mould material or cutting a piece of material (such as mould-stained drywall) with a clean tool and placing the sample into a sample vial or sealable plastic bag. Another method is by applying a piece of clear, not semi-transparent, 18 mm (3/4 inch) cellophane tape against a contaminated surface and sticking the tape to a standard glass 25 x 76 mm (1 x 3 inch) slide or to a piece of plastic for further identification.

Air sampling
Is air sampling for mould needed? In most cases, if visible mould growth is evident, sampling for airborne fungal material is not necessary. In specific instances, such as where the source(s) of the mould contamination is unclear or health concerns are a problem, air sampling may be considered as part of the site investigation. Keep in mind that air sampling for mould provides information only for the moment in time in which the sampling occurred, much like a snapshot. Furthermore, reliable sampling for mould can be expensive, and generally accepted standards for judging what is and what is not an acceptable or tolerable quantity of airborne mould spores have not been established.

In limited circumstances, air sampling for mould in indoor environments before and after remediation can be used as an indicator of remediation effectiveness. To be effectively used in this manner, the mould makeup of the outdoor air should also be determined so that a side-by-side comparison can be made in terms of mould types present and their relative numbers indoors versus outdoors. Post-remediation air sampling should be conducted using a non-culturable sampling method (for example, spore trap sampling or PCR sampling), as the mould may have been killed during the cleaning process. Remember, dead mould can still have allergenic or toxic properties!

Prevention and remediation of mould contamination
Moisture is an essential condition for mould growth. A primary objective in all mould remediation is to identify the sources or causes of moisture and eliminate or control them. Evidence suggests that flooding for periods as brief as 48 hours can lead to mould problems. Other possible sources of moisture are condensation and building leaks.

Once moisture is brought under control, remediation activities can commence. Table 1 provides guidance on methods of remediation and the recommended personal protective equipment. These control measures are based on methods developed by the American Conference of Governmental Industrial Hygienists (ACGIH) and the "EPA Protocol" (*Mold Remediation in Schools and Commercial Buildings* issued by the United States Environmental Protection Agency, March 2001). The EPA document can be viewed at http://www.epa.gov/mold/mold_remediation.html.

The person responsible for remediation will need to use professional judgment and experience to adapt the guidelines in Table 1 to specific projects. In cases where a particular toxic mould species has been identified or is suspected, when extensive hidden mould is expected (such as behind vinyl wallpaper or in a ventilation system), or when the chances of the mould becoming airborne are estimated to be high, a more cautious or conservative approach to remediation should be considered. A health and safety professional with training and experience in conducting mould investigations and developing safe work procedures should be consulted in these circumstances.

Remediation workers need to know the possible health effects of mould exposure to be able to recognize and report symptoms. The emphasis is exposure avoidance through control measures and work procedures. Ventilation, personal protective equipment, and personal hygiene all contribute to safe work methods.

Table 1: Guide for Removing Visible Mould Growth in the Indoor Environment

Extent of Visible and Hidden Mould Growth (surface area)	Minimum Recommended PPE[1]	Control Measures to Prevent Dust or Spore Dispersion[2]
Small Total surface area affected is less than 1 square metre (10 square feet)	N95 respirator or half facepiece respirator with HEPA filters, gloves, and goggles.	Isolation of the work area; wet wiping or misting of surfaces with water containing a surfactant (wetting agent); and the use of drop sheets to prevent dispersion of dust and spores. Material is removed with minimum of dust and spore dispersal and placed in a plastic bag and sealed.
Medium Total surface area affected is between 1 square metre and 10 square metres (10 square feet to 100 square feet)	N95 respirator or half facepiece respirator with HEPA filters, gloves, disposable coveralls, and goggles.	Limited containment: use polyethylene sheeting ceiling to floor around the affected area with a slit entry and covering flap. Maintain area under negative pressure with HEPA filtered negative air unit. Block supply and return air vents within the containment area.
Large Total surface area is greater than 10 square metres (100 square feet) or the potential for increased occupant or remediator exposure during remediation is estimated to be significant.	Full facepiece or powered air purifying respirator (PAPR) with HEPA filters, gloves, disposable coveralls (covering head and boots), and goggles.	Full containment: use of critical barriers. Maintain area under negative pressure with HEPA filtered fan unit exhausted outside the building. Block supply and return air vents within the containment area. Provide facilities and procedures for decontamination and personal hygiene.

[1] Higher levels of respiratory protection should be considered for situations where the "Extent of Visible and Hidden Mould Growth" is categorized as "Small" or "Medium." For example, full facepiece powered air-purifying respirators (PAPRs) with High Efficiency Particulate Arrestor (HEPA) filter cartridges will afford protection to the eyes not available with half-facepiece respirators. As well, in situations where large numbers of spores are released and the area is not well ventilated, a higher level of respiratory protection should be selected and used.

For outdoor remediation projects where mould infestation has not breached the inner vapour barrier, the guidelines in Table 1 apply without the requirement for containment when there is good natural ventilation to the outdoors. Note that for situations where the "Extent of Visible and Hidden Mould Growth" is categorized as "Large" openings and intakes into a building should be effectively sealed to prevent mould contamination from remediation activities entering the building. By using the "Extent of Visible and Hidden Mould Growth" criterion, the appropriate Personal Protective Equipment (PPE) for outdoor remediation work can still be determined.

[2] A health and safety professional with training and experience in conducting mould investigations and developing safe work procedures should be consulted where the "Extent of Visible and Hidden Mould Growth" is classified as "Medium" or "Large." Remediation of mould contamination should be conducted by trained remediation personnel.

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G4.46 Definition of musculoskeletal injury (MSI)

Issued August 3, 2006

Regulatory excerpt
Section 4.46 of the *OHS Regulation* ("*Regulation*") defines "musculoskeletal injury" or "MSI" as follows:

"musculoskeletal injury" or *"MSI"* 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.

Purpose of guideline
This guideline provides further information on the definition of MSI.

Conditions addressed by the definition
The definition of "musculoskeletal injury" includes reference to a sprain, strain, and inflammation that may be caused or aggravated by work.

A **sprain** is a joint injury in which some of the fibers of a supporting ligament are ruptured but the continuity of the ligament remains intact.

A **strain** is an overstretching or overexertion of some part of the musculature.

An **inflammation** is a localized response to injury or trauma that is marked by increased blood flow, redness, heat, pain, swelling, and often a loss of function.

The Ergonomics Requirements are intended to help address the risk of overexertion injuries of the back as well as strain and sprain injuries to other parts of the body. They are also intended to address the risk of injuries or conditions such as tenosynovitis, tendonitis, bursitis, hand arm vibration syndrome, epicondylitis, carpal tunnel syndrome, cubital tunnel syndrome, radial tunnel syndrome, thoracic outlet syndrome, and trigger finger.

G4.47 Risk identification

Issued August 3, 2006; Revised December 1, 2006

Regulatory excerpt
Section 4.47 of the *OHS Regulation* ("*Regulation*") states:

> The employer must identify factors in the workplace that may expose workers to a risk of musculoskeletal injury (MSI).

Purpose of guideline
This guideline provides information on the context of section 4.47 and how to identify risk factors.

The context of section 4.47
Risk factor identification is the first step in a process involving identification, assessment, control, and evaluation.

Section 4.49 lists factors that must be considered during the risk identification process. In some cases other factors such as illumination or vibration may be involved, which are addressed respectively in sections 4.64 - 4.69 and 7.10 - 7.16 of the *Regulation*.

Risk identification will be conducted by persons who are knowledgeable of work procedures, and the associated MSI risk factors. The risk identification process can be a part of a workplace inspection carried out under sections 3.5 to 3.8 of the *Regulation*.

Note: Section 4.53 requires that the joint occupational health and safety committee or worker health and safety representative, as applicable, must be consulted on risk identification.

How are risk factors identified?
In identifying risk factors, the employer should give priority to jobs which have a high risk of MSI.

The employer should check past workplace records for evidence of MSI, including first aid records and claims history. The records should be examined for a sufficient period of time to ensure that any occurrences are identified, and where possible, that any patterns are clear. To achieve both objectives it is recommended that records be kept for at least several years.

Other sources of information include

- Interviews with workers and supervisors
- Trends in the employer's industry
- MSI statistics in similar operations where available

In addition to reviewing records, risk factors can be identified through direct observation of the work activities. For this purpose, the employer has the option of using the *MSI Risk Factor Identification Worksheet A* which can be found via the Ergonomics portal on the WorkSafeBC website. The Worksheet covers a number of factors to consider and includes links to documents that address several others.

Generally, there will be more than one risk factor identified for a given work activity. This may occur because of the nature of the activity but may also be attributable to the personal characteristics of different workers doing the job, for example, their height.

Notes of the records reviewed, priorities established, and risk factors identified for work activities will be of assistance to the employer in following through on risk assessment and control.

G4.48 Risk assessment

Issued August 3, 2006; Revised December 1, 2006

Regulatory excerpt
Section 4.48 of the *OHS Regulation* ("*Regulation*") states:

> When factors that may expose workers to a risk of MSI have been identified, the employer must ensure that the risk to workers is assessed.

Purpose of guideline
This guideline outlines objectives for the risk assessment, and provides information on who should conduct it and how it can be performed.

Objectives of the risk assessment
The objectives include

- Determining the extent of impact of various risk factors on the potential for MSI
- Where feasible, determining the relative risk of MSI among workers or groups of workers

Achieving these objectives will assist with establishing priorities for the control of risks.

Who performs the assessment?
The risk assessment will be completed by a person who has a good understanding of

- The work processes involved
- The physical demands of work tasks and the factors which influence them (see the booklet *Preventing Musculoskeletal Injury (MSI) A Guide for Employers and Joint Committees*
- The methods for performing a risk assessment such as those referred to in this guideline

Note: Section 4.53(1) requires that the joint occupational health and safety committee or worker health and safety representative, as applicable, must be consulted on the risk assessment. Also, section 4.53(2) requires that during a risk assessment, the employer must consult with the workers with signs or symptoms of MSI, and a representative sample of the workers who are required to carry out the work being assessed.

How is the assessment performed?
A risk assessment can be performed using a variety of methods. WorkSafeBC provides the *MSI Risk Factor Assessment Worksheet B*, which addresses a number of the factors to be considered. Other methods may be used as long as they ensure the proper identification and assessment of risks. Worksheet B can be found via the Ergonomics portal at the WorkSafeBC website.

Methods of assessment may include but are not limited to

- Observation of workers performing their tasks, including videotaping
- Still photographs of work postures, workstation layout, etc.
- Workstation measurements, using for example, a measuring tape, or weigh scales
- Measurement of handle size, weighing tools, measuring tool vibration, etc.
- Determination of characteristics of work surfaces such as slip resistance
- Measurement of exposures to heat, cold, vibration, noise, and lighting
- Biomechanical calculations, for example, the force required to accomplish a task or the pressure put on a spinal disk
- Physiological measures
- Worker surveys (for example, use of subjective force rating scales)
- Task analysis techniques (for example, NIOSH lifting equation, SNOOK push/pull tables – see *The design of manual handling tasks: Revised table of maximum acceptable weights and forces in Ergonomics, Vol. 34, No. 9, 1991*). Also, a Push/Pull/Carry Calculator is provided via the Ergonomics portal on the web site www.worksafebc.com
- Postural analysis techniques (for example, the Ovako Working Posture Analysis System (OWAS), Rapid Upper Limb Assessment (RULA), or WATBAK (a biomechanical modeling program from the University of Waterloo))

The person(s) performing the assessment and using any of these methods should understand the applications and limitations of the method being used.

G4.49 Risk factors

Issued August 3, 2006

Regulatory excerpt
Section 4.49 of the *OHS Regulation* ("*Regulation*") states:

> The following factors must be considered, where applicable, in the identification and assessment of the risk of MSI:
>
> (a) The physical demands of work activities, including
>
> (i) force required

(ii) repetition

(iii) duration

(iv) work postures

(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

(iv) floor surfaces

(c) The characteristics of objects handled, including

(i) size and shape

(ii) load condition and weight distribution

(iii) container, tool and equipment handles

(d) The environmental conditions, including cold temperature

(e) The following characteristics of the organization of work

(i) work-recovery cycles

(ii) task variability

(iii) work rate

Purpose of guideline
This guideline provides information on the risk factors outlined in section 4.49.

General information
Section 4.49 states that the listed factors must be considered "where applicable." This means that the factors must be considered where they are present. Not all tasks will have all risk factors present.

In addition, it is acceptable for the employer to give priority to considering the risk factors relevant to high risk tasks that have caused injuries in the past.

Information on risk factors listed in section 4.49
Each of the factors listed in 4.49 is discussed below. Though listed separately, these factors often act in combination.

Force required (Section 4.49(a)(i))
This refers to the effort a worker must exert to counteract a load. This load may be experienced in the body through tension (such as muscle tension), pressure (such as increased pressure in the carpal canal), or irritation (such as irritation of a peripheral nerve). The greater the magnitude/intensity of the force, the greater the risk of causing an MSI.

Repetition (Section 4.49(a)(ii))
This refers to the cyclical use of the same body tissues either as a repeated motion or as a repeated muscular effort without movement. If motions are repeated frequently or for long periods without sufficient time to return to a resting state for recovery, there is risk of developing MSI. Consideration should be given to the following:

- How often the same motion or muscular effort is performed within a certain period of time
- The amount of time during or between a given work cycle for the affected muscle or tendon group to return to the recovery state

Duration (Section 4.49(a)(iii))
This refers to the length of time a person is exposed to a particular risk. A person may be exposed to a task that continually uses the same muscles and tendons.

Work postures (Section 4.49(a)(iv))
This refers to postures that are awkward. This occurs where joints are held at or near the end of range of motion or where muscle tension is required to hold the posture without movement. Awkward postures place significant stress on tendons, muscles, and other soft tissues and decrease their strength and efficiency. Postures to watch for include

- Shoulder abduction or flexion
- Flexion or extension of the wrist
- Ulnar deviation of the wrist
- Squatting and stooping
- Flexion or extension of the neck
- Rotation or side bending of the neck

Local contact stress (Section 4.49(a)(v))
This refers to physical contact between body tissues (in a small localized area) and objects in the work environment such as tools, machinery, and products. Local contact stress, when applicable, usually involves the knee, shoulder, elbow, wrist, or hand. Point pressure may also occur at the sides of fingers. Pressure over these areas may inhibit nerve function and/or blood flow.

Working reaches (Section 4.49(b)(i))
This refers to the risks that can result from reaching behind the shoulder, forward, or across the body. This factor may cause MSI, either through a single incident or through a repetitive or cumulative process.

Working heights (Section 4.49(b)(ii))
This refers to the risks from having to accommodate to inappropriate work surface heights for an extended period of time.

Seating (Section 4.49(b)(iii))
This refers either to the physical properties of a chair or seat, or prolonged sitting required by some jobs. The Canadian Standards Association (CSA) has issued the standard *CAN/CSA-Z412-M89 A Guideline on Office Ergonomics*, and WorkSafeBC has produced the booklet *How to Make Your Computer Workstation Fit You*. These publications can assist with an understanding of this factor. WorkSafeBC publications on ergonomics are available at the WorkSafeBC website.

Floor surfaces (Section 4.49(b)(iv))
This refers to the physical characteristics of a floor, including grade, surface texture and material, unevenness, and slip resistance. Examples of risk factors associated with floor surfaces include

- Sloped surfaces and ramps, which can result in an increased effort to carry, push, pull, or manipulate loads
- Hard surfaces, which can cause increased fatigue and back discomfort to workers who have to stand on them for an extended period of time
- Uneven work surfaces, which can increase the force needed to move objects
- Floors that are slippery, which can cause an increased risk of falling or slipping

Size and shape (Section 4.49(c)(i))
This refers to the size and shape of an object and how it influences physical demands on the body. A large bulky object requires greater energy, puts greater stress on the spine, and increases difficulty in gripping. Large loads may restrict vision or require the use of an awkward posture to see around them. If the outside corners of a deep box are not within reach when the top of the box is at waist height, a good grip will be difficult.

Load condition and weight distribution (Section 4.49(c)(ii))
The condition and weight of a load will determine how workers handle it. For inanimate objects, the term "condition" typically refers to factors such as whether the load is slippery, sharp, fragile, hot or cold, rigid, or liquid. For example, to handle fragile loads, workers may have to use awkward or static postures. On the other hand, rigid loads facilitate a good grip and smooth predictable movements.

Note that patient handling is an important issue in the prevention of MSI in the health care sector. Factors such as patient size and condition are significant considerations for the safety of both the worker and the patient. The condition of the patient may affect the degree of effort needed to move the patient safely, and the precautions necessary to help ensure the move does not involve unexpected risks.

Containers, tool and equipment handles (Section 4.49(c)(iii))
Objects without handles are more difficult to handle and require more forceful gripping, which can result in an awkward posture. Important considerations in handle design include size, shape, texture, and location.

Size	Improper handle size increases fatigue; handles should accommodate gloves
Shape	Sharp edges, grooves, seams may cause contact stress
Texture	Slippery handles may cause dropping
Location	Improperly placed handles may force an awkward posture of wrists or arms. Asymmetrical placement may cause hazards of tipping of an unstable load

Environmental conditions, including cold temperature (Section 4.49(d))
Cold temperatures may have a direct adverse effect on the tissue through vascular constriction. Cold temperatures are related to increased forceful exertions and increased gripping forces.

Poor lighting and glare can adversely affect postures as well as cause eyestrain. This is addressed in sections 4.64 - 4.69 of the *Regulation* on illumination.

Hand/arm vibration is linked to conditions such as carpal tunnel syndrome, and vibration white finger disease. Sections 7.10 - 7.16 of the *Regulation* and associated OHS Guidelines deal specifically with vibration.

Work-recovery cycles (Section 4.49(e)(i))
This refers to the availability and distribution of breaks in a particular activity to allow the tissue to return to a resting state for recovery. Breaks can be achieved in various ways, including job rotation or use of different body parts to perform a task, for example alternate use of the right and left hands.

Task variability (Section 4.49(e)(ii))
The longer the time a task remains unchanged, unvaried, or uninterrupted, the less likely are the affected tissues to return to a resting state for recovery.

Work rate (Section 4.49(e)(iii))
This refers to the speed at which the tasks are being carried out. Individual workers may vary somewhat in the rates at which they can safely perform the same task. In some cases work rate may be associated with non-optimal work techniques that could add to the risk of injury. The more critical or physically demanding the task, the more appropriate it is to ensure the pace is properly set for the worker. Planning the work rate will also involve consideration of work recovery cycles, task variability, and staffing schedules.

G4.50-1 Risk control

Issued August 3, 2006

Regulatory excerpt
Section 4.50 of the *OHS Regulation* ("*Regulation*") states:

> (1) The employer must eliminate or, if that is not practicable, minimize the risk of MSI to workers.
>
> (2) Personal protective equipment may only be used as a substitute for engineering or administrative controls if it is used in circumstances in which those controls are not practicable.
>
> (3) The employer must, without delay, implement interim control measures when the introduction of permanent control measures will be delayed.

Purpose of guideline
This guideline provides information on the application of section 4.50(1), and discusses the hierarchy of controls and interim controls under sections 4.50(2) & (3).

Section 4.50(1) - General requirement for control of risk
The employer will eliminate or minimize the risks by creating control mechanisms for the risk factors found during the risk assessment.

In some cases, the control of ergonomic risk involves matters covered in other sections of the *Regulation*, or in the *Workers Compensation Act* ("*Act*"). Examples include lighting, vibration, unsafe work practices, and training.

Risk factors must be eliminated where practicable. "Practicable" is defined in section 1.1 of the *Regulation* as "that which is reasonably capable of being done." In determining if elimination is "practicable," the relevant considerations include

- Degree of risk to the worker arising from risk factors
- Extent of available information on the risk and the means of controlling it
- Availability and suitability of control measures
- Frequency of performing tasks that contain risk factors
- Resources needed to control the risk

Where elimination is not practicable, the specific risk factors identified in the risk assessment should be reduced to the lowest practicable level. Typically this means minimizing the duration, magnitude, and/or frequency of the relevant risk factor. Care should be taken to ensure that the reduction of risk of MSI from one factor does not increase the risk from another.

As a general rule, risk factors for tasks which are performed most of the time should be considered first. The primary risk factors to consider normally include awkward postures, force required, and repetition.

Note: The employer is required under section 4.53 to consult with the joint occupational health and safety committee or worker health and safety representative, as applicable, on the implementation of controls.

Section 4.50(2) Hierarchy of controls/personal protective equipment
Under section 4.50(2) engineering or administrative controls must, where practicable, be used in preference to personal protective equipment (PPE) for eliminating or reducing the risk of MSI.

Section 1.1 of the *Regulation* states that "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."

Section 1.1 defines "administrative controls" to mean 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."

PPE for MSI includes, but is not limited to the following:

- Gloves (for example, vibration dampening gloves, friction gloves)
- Footwear (for example, safe, cushioned footwear with a comfortable toe box, and proper-fitting, low profile heels)
- Devices to protect against contact stress (for example, knee pads and wrist rests on computer keyboards)

WorkSafeBC provides Ergonomics Commentary sheets on topics such as the computer mouse, wrist braces, and back belts. These can be accessed via the Ergonomics portal at the WorkSafeBC website.

Section 4.50(3) Interim controls
This section permits the use of interim controls if the introduction of permanent controls will be delayed.

"Delayed" in this context means putting off the introduction of permanent control measures for reasons related to practicability. For example, the cost of, or time required to develop control measures, may require that they be phased in over a period of time.

Section 4.50(3) requires that "interim control measures" be applied to minimize risk while more effective or long term solutions are being developed. The section does not authorize the employer to delay the introduction of practicable control measures for other reasons.

G4.50-2 Minimizing the risk of MSI when moving a physically-dependent person

Issued September 12, 2017

Regulatory excerpt
Section 4.50 (Risk control) of the *OHS Regulation* ("*Regulation*") states:

> (1) The employer must eliminate or, if that is not practicable, minimize the risk of MSI to workers.
>
> (2) Personal protective equipment may only be used as a substitute for engineering or administrative controls if it is used in circumstances in which those controls are not practicable.
>
> (3) The employer must, without delay, implement interim control measures when the introduction of permanent control measures will be delayed.

Purpose of guideline
The purpose of this guideline is to provide information on controls for minimizing the risk of musculoskeletal injury ("MSI") when a worker moves a physically-dependent person. This guideline applies to situations where it has been determined that moving a physically-dependent person is required and a worker is exposed to the risk of MSI.

Background
A physically-dependent person (such as a patient, resident, client, customer, or student) is a person who requires physical assistance to move himself or herself. Typical actions which involve moving a physically-dependent person and pose a significant risk of MSI to workers include, but are not limited to, the following:

- Lifting or lowering (e.g., from the floor to a bed; in or out of a bathtub)
- Transferring (e.g., from a bed to a chair; from a chair to the toilet)
- Repositioning (e.g., boosting in a bed or chair; turning in bed)
- Supporting (e.g., limbs during surgery or wound care, labour, and delivery)
- Rehabilitating and activating (e.g., ambulation training)

Some examples of workplaces in which these actions are performed include the following: health care (including acute, residential, home and community care, hospice, ambulance, and rehabilitation services), social services, schools, daycares, transportation, correctional facilities, and municipalities (including swimming pools and fire services).

Controls for minimizing the risk of MSI
Section 4.50(1) requires the employer to take steps that will eliminate or, if that is not practicable, minimize the risk of MSI. OHS Guideline G4.50-1 Risk control explains that, where elimination is not practicable, the risk factors are to be reduced to the lowest practicable level.

When moving physically-dependent people, there are different control options for minimizing the risk of MSI. Examples of commercially available engineering controls for moving physically-dependent people include the following:

(a) Mechanical equipment (e.g., powered lifts, air-assisted lifts and sliding aids, turning mattresses, and standing beds)

(b) Non-mechanical equipment or aids (e.g., slide sheets, transfer boards)

However, not all controls reduce risk factors equally. In order to determine which control will reduce the risk of MSI to the lowest practicable level, the employer can research industry best practices, and consult with equipment suppliers and other employers doing similar work.

Some questions that may assist in determining which control(s) will minimize risk include the following:

- Will the equipment allow the worker to conduct all required tasks?
- Is the equipment suitable for the space where the task(s) will take place?
- Have the risk factors to workers, identified in the risk assessment, been minimized?
- Does the equipment avoid creating new hazards to the worker or the person being lifted?

Controlling the risk of MSI while moving a physically-dependent person involves a number of additional elements, such as policies and procedures (including provision for emergency situations), complementing equipment (e.g., adjustable beds, wheelchairs, and tubs), equipment maintenance, adaptive clothing, training, supervision, etc. Training workers on the appropriate selection and use of available controls is an important element. However, it should be noted that training in body mechanics and manual handling on its own does not minimize the risk of MSI and is not considered a control.

Resources
For more information refer to the *Provincial Safe Resident Handling Standards for Musculoskeletal Injury Prevention in British Columbia*.

G4.51 Education and training

Issued August 3, 2006

Regulatory excerpt
Section 4.51 of the *OHS Regulation* ("*Regulation*") states:

> (1) The employer must ensure that a worker who may be exposed to a risk of MSI is educated in risk identification related to the work, including the recognition of early signs and symptoms of MSIs and their potential health effects.
>
> (2) The employer must ensure that a worker to be assigned to work which requires specific measures to control the risk of MSI is trained in the use of those measures, including, where applicable, work procedures, mechanical aids and personal protective equipment.

Purpose of guideline
This guideline provides information to assist with understanding terms in section 4.51(1) and on what is meant by "trained" in section 4.51(2).

Section 4.51(1)
This provision requires that workers be educated as to the risk factors which have been identified during the risk identification process under section 4.47 for a work activity that they perform. The education needs to be sufficient so the workers are aware of the applicable risk factors and their potential impact on the body.

Because all work has a physical component to it (i.e. from lifting a box to sitting behind a desk) risk factors are likely to be identified in the majority of jobs. Therefore, most workers will need education under this provision.

The early signs and symptoms of MSI include but are not limited to the following:

- Pain or discomfort
- Reduced range of motion at a joint
- Swelling
- Tingling, numbness
- Weakness when trying to perform a natural action like grasping

See OHS Guideline G4.46 for more information on the medical conditions addressed by the Ergonomics Requirements. WorkSafeBC has also produced the booklet *Understanding the Risks of Musculoskeletal Injury (MSI)* to help employers with the requirements of section 4.51(1) to educate workers in risk identification, signs and symptoms of MSI, and their potential health effects. These can be accessed via the Ergonomics portal at the WorkSafeBC website.

Section 4.51(2)
In this provision, "trained" refers to the provision of practical information so that the workers affected understand why a control measure is in place and are able to effectively apply the control measures in their work.

Workers should be able to demonstrate an understanding of the education and training. To check this, it may be useful to ask workers about the risk factors present in their job and if there are specific procedures or equipment they use to reduce the risk. Sample questions for the worker could include

- What are some early signs and symptoms of MSI, and what could happen if they are ignored?
- Who should you report any signs and symptoms of MSI to?
- What are the risks of MSI in your job?
- What can be done to reduce the risk of MSI in your job?

Note: Section 4.53 of the *Regulation* requires that the joint occupational health and safety committee or worker health and safety representative,

as applicable, must be consulted on the content and means of provision of education and training under section 4.51.

G4.52 Evaluation

Issued August 3, 2006

Regulatory excerpt
Section 4.52 of the *OHS Regulation* ("*Regulation*") states:

> (1) The employer must monitor the effectiveness of the measures taken to comply with the Ergonomics (MSI) Requirements and ensure they are reviewed at least annually.
>
> (2) When the monitoring required by subsection (1) identifies deficiencies, they must be corrected without undue delay.

Purpose of guideline
This guideline provides information on what is meant by conducting a review under section 4.52(1) and some of the considerations when applying section 4.52(2).

Section 4.52(1) - Conducting a review
This section requires the employer to monitor the effectiveness of control measures and ensure they are reviewed at least once a year.

The review must cover all the measures taken under sections 4.47 to 4.51, including risk identification and assessment, the implementation of control measures, and the education and training of workers.

In reviewing the effectiveness of existing measures, employers will evaluate whether they have eliminated or minimized the degree of risk to workers. The information to be considered may include evidence on changes of exposure to risk factors, reports of worker discomfort, MSI records in the first aid book, and MSI claims.

Section 4.52(1) states that a review must be done at least annually. A review is also required when significant changes in circumstances occur, including when

- MSI of a different type is reported, or workers report signs and symptoms of MSI of a different type
- A request from a worker is received to identify a risk factor that has not previously been considered
- A new or changed piece of equipment is implemented
- When new work stations or work processes are initiated

Note: Section 4.53 requires that the joint occupational health and safety committee or worker health and safety representative, as applicable, must be consulted in the evaluation.

Section 4.52(2) – Effective control measures
If monitoring shows there has been no reduction in the level of risk to workers or reports of discomfort, the effectiveness of the measures taken will need to be considered, and a determination made of whether additional corrective action should be taken.

If any different injury or signs or symptoms are reported, or any new risk factors are identified during a review, these need to be assessed and appropriate risk control measures taken. Identification of new MSI or new risks means the priority for addressing MSI should be reviewed, and the overall MSI program adjusted as necessary to ensure the areas of highest risk are receiving appropriate action.

G4.53 Consultation

Issued August 3, 2006

Regulatory excerpt
Section 4.53 of the *OHS Regulation* ("*Regulation*") states:

> (1) The employer must consult with the joint committee, if any, or the worker health and safety representative, as applicable, with respect to the following when they are required by the Ergonomics (MSI) Requirements:
>
> (a) Risk identification, assessment and control
>
> (b) The content and provision of worker education and training
>
> (c) The evaluation of the compliance measures taken
>
> (2) The employer must, when performing a risk assessment, consult with
>
> (a) Workers with signs or symptoms of MSI, and
>
> (b) Representative sample of the workers who are required to carry out the work being assessed

Purpose of guideline
This guideline provides information on expectations for consultation under subsections (1) and (2) of this requirement. Consultation includes seeking the participation of the affected parties and asking for their input on measures taken under sections 4.47 to 4.52 of the *Regulation*.

Section 4.53(1)
Section 4.53(1) requires the employer to consult with the joint occupational health and safety committee or worker health and safety representative, as applicable, regarding implementation of ergonomic requirements. It is expected that ergonomic requirements will be incorporated as part of the occupational health and safety program for the workplace.

Section 4.53(2)
This provision requires the employer to consult with the affected workers when a risk assessment is being done regarding tasks or functions performed by those workers. A "representative sample" under subsection (2)(b) means, in addition to workers with signs or symptoms, a cross section of workers, having regard to differences in age, shift schedule, gender, size (height, weight), and work location (climatic conditions can vary considerably, and clothing or icy surfaces may result in different levels of risk for similar tasks). The size of the sample will depend on how many applicable differences there are in the group.

G4.13(1) Emergency preparedness and response - Risk assessment

Issued September 1999; Editorial Revision December 2, 2011; Revised November 2, 2016

Regulatory excerpt
Section 4.13 of the *OHS Regulation* ("*Regulation*") states:

> (1) The employer must conduct a risk assessment in any workplace in which a need to rescue or evacuate workers may arise.
>
> (2) If the risk assessment required by subsection (1) shows a need for evacuation or rescue, appropriate written procedures must 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.

Purpose of guideline
The purpose of this guideline is to provide information regarding some situations that require written rescue and evacuation procedures.

Work at high angles
Section 4.13(3)(a) states that written rescue and evacuation procedures are required for work at high angles. Work at "high angles" means a worker is in a position that cannot be reached by a standard stairway or elevator, and thus an injured worker on a stretcher could not be brought to a location accessible by an ambulance crew without use of specialized rescue equipment and techniques. Some examples are rock scaling while suspended on a rappel system, work being done using a swing stage, work on the jib or upper portions of a tower crane and work in an excavation.

Work with hazardous substances
An office or small retail operation with minimal storage of chemicals (just normal quantities of regular office supplies such as toner and "white out") will not normally need procedures beyond a basic fire evacuation plan for the premises. If part of the operation involves processing or warehousing chemicals, a more elaborate plan may be needed, including in-house capability to shut down processes and assist injured workers.

Where persons require physical assistance to be moved
The risk assessment may indicate that there are persons at the workplace who will need to be assisted by workers to move during an evacuation. The reason for requiring physical assistance will typically be because of a physical impairment affecting a person's ability to safely evacuate on his or her own (e.g., persons with disabilities which require them to use wheelchairs or other means of assistance to move about, or persons who are unable to walk in the event of a medical emergency such as a cardiovascular incident, seizure, asthma attack, or severe allergic reaction). In such cases, written rescue and evacuation procedures must be developed (refer to section 4.13(3)(f)). The procedures also need to be practiced (refer to section 4.14(3)) so workers know their responsibilities and the procedures and equipment to be used.

Work with hazardous stored energy
A risk assessment is required under section 4.13(1) for workplaces in which a need to rescue or evacuate workers may arise. This includes workplaces where hazardous stored energy is present. Some examples of facilities where work with hazardous stored energy is carried out

include, but are not limited to: electrical substations, transmission towers, hydroelectric dams, and water towers. In these types of workplaces, the risk assessment will typically show a need for evacuation or rescue and, as a result, appropriate written procedures.

The extent and complexity of the rescue and evacuation procedures will depend on a number of circumstances, which include the following:

- The nature and level of risk associated with the potential for a release of hazardous energy
- Issues hindering the evacuation of workers from the facility
- Whether the facility is in a remote location

Evacuation by air
Where a risk assessment made under section 4.13 concludes that removal by air is the most practicable method of evacuating injured workers, the employer's written procedures must conform to Transport Canada as well as WorkSafeBC requirements. Refer to Part 29 of the *Regulation*.

G4.13(3)(a) Industrial high angle rope rescue program

Issued September 1999; Editorial Revision August 2004; Editorial Revision March 31, 2010; Revised April 13, 2011; Editorial Revision December 15, 2017; Revised February 15, 2019

Regulatory excerpt
Section 4.13 of the *OHS Regulation* ("*Regulation*") states in part:

> (1) The employer must conduct a risk assessment in any workplace in which a need to rescue or evacuate workers may arise.
>
> (2) If the risk assessment required by subsection (1) shows a need for evacuation or rescue, appropriate written procedures must 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,
>
> …

Purpose of guideline
This guideline describes the specialized rescue service for high angle rope rescue and lists municipal fire/rescue departments that have developed high angle rope rescue capability using techniques and equipment acceptable to WorkSafeBC. It also provides guidance on other acceptable means of rescue and arranging rescue service for short-term and long-term work at high angles.

Introduction
Rescue of a worker at a high elevation can be effectively done in a variety of ways, depending on the circumstances at the workplace. For example, on a construction site, the personnel hoist may be used, or a "dedicated emergency platform" (DEP) hoisted by a tower or mobile crane may be used to remove an injured worker. Some work activities, for example window washing, swing stage work, and tower crane operation result in a need for high angle rescue capability to rescue or remove a stranded or injured worker. An employer may develop its own high angle rescue capability, and this requires specialized equipment, training, and practice.

As an alternative, for a workplace located in an area serviced by a local fire/rescue department, and where the department has high angle rope rescue capabilities, the employer may be able to arrange for the department to provide rescue services for the employer's operation.

Municipal fire/rescue departments with high angle rope rescue capability
The following municipal fire/rescue departments have developed high angle rope rescue capability using techniques and equipment acceptable to WorkSafeBC for workplace rescue. (The initiative to develop this capability was in part sponsored by WorkSafeBC under the *Technical High Angle Rope Rescue Program*.)

City of Abbotsford	City of Langley	City of Prince George
City of Burnaby	City of Nanaimo	City of Prince Rupert
City of Campbell River	City of Nelson	City of Quesnel
City of Coquitlam	City of New Westminster	City of Richmond
City of Delta	City of North Vancouver	City of Saanich
City of Fort St. John	District of North Vancouver	City of Surrey
City of Kamloops	City of Penticton	City of Terrace
City of Kelowna	City of Port Alberni	City of Vancouver
City of Kitimat	City of Port Coquitlam	City of Victoria

Regional District of Kootenay Boundary	City of Port Moody	City of West Kelowna
City of Langford	District of Powell River	City of West Vancouver
		Municipality of Whistler

Notice of rescue service for short-term work
If an employer wants to use the local municipal fire/rescue department as a high angle rope rescue service provider, the employer must notify the department in advance, and ensure the department is capable and prepared to provide the required services. If the employer's activity is a short-term/transient activity such as window cleaning or other work using suspended staging, or tower crane erection, the employer may use the following form, "Notice of Rescue Service for Short-term Work," to document notification of the fire/rescue department. The employer should keep a copy of the completed form as part of fall protection records.

Application for industrial rescue service
For workplaces with a longer term need for rescue capability to be available, particularly where site conditions are regularly changing such as at a high-rise construction project, a more formal written agreement needs to be established between the employer and the fire department.

A sample of such a formal agreement is included at the end of this guideline. A copy of the written agreement must be available at the workplace as an attachment to the fall protection plan required by section 11.3 of the *Regulation*. The fire/rescue department may

- Visit the workplace to determine site suitability for rescue purposes
- Request additional and reasonable provisions to assist rescue capabilities
- Refuse to enter into an agreement to provide rescue services if all reasonable requirements are not fulfilled

Notice of Rescue Service for Short-term Work

British Columbia's Occupational Health & Safety
Regulation section 4.13(1) requires employers to
conduct a risk assessment in any workplace in which
a need to rescue or evacuate workers may arise.
This includes work at high angles. For the erection
of a tower crane or other short-term work such as
window washing or swing stage work, if the risk
assessment shows a need for evacuation or rescue,
then appropriate written procedures must be developed
and implemented and a worker assigned to coordinate
their implementation.

The intent of this notification form is to assist
employers in meeting this step before conducting
short-term work and will form part of the development
of written procedures once it is **completed**
and the appropriate rescue service is notified.
All fields below should be completed.

DATE FORM COMPLETED: _____ COMPLETED BY:_____

FROM: _____
(Company Name)

This confirms that the rescue service of_____
has been advised that a need to rescue or evacuate
workers may arise. This includes work at high angles.
For example, the erection of a tower crane or other
short-term type work such as window washing or swing
stage work. Short-term work that ***could*** require a high
angle rope rescue team response in the event of an
accident will be conducted as follows (please print):

Describe work to be conducted:

_____

Dates of the short-term work - Start _____ End ____

Worksite address: _____

Access the site from: _____

Rescue Service Contact: _____ Position: _____

Phone: _____ Date spoken with:_____

Site contact: _____ Position: _____

Phone: Day _____ Cell/Pager: _____

Number of workers: _____

Notes:

- A site inspection (assessment) by the fire/rescue department **is not required** prior to the short-term work. However, the above information needs to be confirmed with the fire/rescue department.
- There **is no requirement** to send this document to the fire/rescue department.
- Retain this completed form for your records.

TECHNICAL HIGH ANGLE ROPE RESCUE PROGRAM
Fire Service Application for Technical High Angle Rope Rescue Service

We, the undersigned, being authorized representatives of the business named herein (hereinafter referred to as the "Company"), and contributors to the funding of the Fire Service Rope Rescue Program (hereinafter referred to as the "Service"), hereby request said Service for the duration of the Company's construction project indicated below. The Company acknowledges and understands that eligibility for, and access to the Service shall remain contingent upon the Company's continuing compliance with the prerequisite Terms and Conditions of Service defined in this document. The Company further acknowledges that from time to time, authorized representatives of the Service reserve the right to verify the Company is in compliance with the Terms and Conditions of Service and agree to cooperate with the representatives during such verifications. The Company fully understands that failure to comply with the Terms and Conditions of Service may result in termination of Service, which may result in the Company being in contravention of Workers' Compensation Board's Occupational Health and Safety Regulation. **"Tower Crane Technical High Angle Rope Rescue Service or Service is understood to mean: Command and execution of a rope rescue by a Fire Department and does not imply any guarantee of the success of a rescue."**

TERMS AND CONDITIONS OF SERVICE

1. The Company shall ensure that the information contained herein is communicated to all persons employed by the Company who are, or may become responsible for, the establishment and maintenance of the Terms and Conditions below.
2. The Company shall ensure that a facility at, or on, the project named herein, has been designated as the Fire Service Technical Rescue Command Post, and has been appropriately identified and equipped with signage acceptable to the representatives of the Service.
3. The Company shall designate one (1) liaison person from the head office, to whom the Service shall have reasonable access to a twenty-four (24) hour basis, and two (2) liaison persons at the project site to whom the Service shall have immediate access to during normal business hours and on-call access on a twenty-four (24) hour basis. Portable communication devices to be utilized shall be acceptable to the representatives of the Service.
4. The Company shall provide to representatives of the Service, a plot plan of the project complete with the street address, on which shall be identified the Service's staging area, access routes to the site, temporary structures and utilities, locations and particulars of where a rescue may need to be performed.
5. The Company shall ensure the access point and staging areas are maintained in such a fashion as to accommodate the requirements of the vehicles, materials and equipment of the Service. The Company shall immediately notify the Service of any deviation from this requirement that may affect the response time of the Service.
6. If, upon a site survey, a Fire Department identifies a need for special or extra equipment out of the ordinary, *a Department representative should contact the BCCSA THARR Program Representative* at 1.877.860.3675 or tharrp@bccsa.ca.

Fire Service Application For Tower Crane Technical High Angle Rope Rescue Service
APPLICATION PARTICULARS

Company Name:_____

Company Address:_____

Company Liaison: Name:_____ Position:_____

Phone (day):_____ Phone(evening):_____

Pager/Cell:_____

Project Name:_____

Project Address:_____

Project Liaison: Name:_____ Position: _____
(Primary)
Phone (day):_____ Phone (evening):_____ Pager/Cell:_____

Project Liaison: Name:_____ Position: _____
(Secondary)

Phone (day):_____ Phone (evening):_____ Pager/Cell: _____

Anticipated service requirement end date: _____

Type of Request(please check):

__ first site survey __ multiple cranes

Crane Manufacturer/Crane Specific ID: _____

__ second site survey due to relocation or addition of a crane on the site

Crane Manufacturer/Crane Specific ID: _____

__ or annual site survey on long-term project

Crane Manufacturer/Crane Specific ID: _____

__ Other

Please explain: _____

The crane(s) will be available on the following date(s) for fire department training: _____

*Please note: this form must be completed in its entirety.

We, the undersigned, being authorized representatives of the Company and the Fire Service, agree to the Terms and Conditions of Service and additional requirements stated herein. A copy of this application and The Terms of Conditions have been received by The Company. The Company shall be eligible for Service as of this date.

FOR THE COMPANY:

_____ _____

Representative Name and Title (Please Print) Signature

FOR THE SERVICE:

_____ _____

Representative Name and Title (Please Print) Signature

DATED this ____ day of _____, 20 ___.

If a workplace is located outside the service area of a municipal fire/rescue department providing high angle rope rescue service, the employer has to provide for any necessary high angle rescue requirements by other acceptable means.

Rescues outside service area by other acceptable means

Evacuation or rescue of a worker at high angles is a high-risk operation requiring training and equipment to match the nature of the situation. The required competencies of the person or persons involved in conducting the rescue and the required equipment are dependent on the circumstances identified in the risk assessment and need to be part of the site-specific rescue plan.

The site-specific rescue plan must include equipment and procedures specific to the operation. Workers who execute the site-specific rescue plan must have appropriate training which provides them with the competencies necessary to conduct the rescue in a safe manner without endangering either the worker(s) being rescued or the worker(s) performing the rescue.

Equipment

The employer must ensure that workers involved in the rescue plan/procedures are trained and competent in the use and implementation of all high angle rescue equipment and procedures. The equipment must be suitable and compatible for its intended application/use and all equipment must be maintained and used in accordance with the manufacturer's instructions, the applicable standards, and the requirements of the *Regulation*.

Training

A rescuer's training and experience must be suitable for the type of rescue being performed. Depending on the nature of the potential rescue, appropriate training may consist of one or more of the following:

- Site-specific training
- Rescue courses or programs
- Related training
- Rescue training which conforms to National Fire Protection Association (NFPA) or equivalent standards

Each of the above options is further described below.

Site-specific training
A qualified person may create a training program which is site or job specific. This training program should take into consideration all probable hazards to which the rescuers could be exposed, as well as ways to effectively address these hazards. The scope of training for such programs may be significantly different from program to program. This type of training would not necessarily qualify a person to perform or coordinate rescues at other workplaces.

Rescue Training
Rescuers may have taken a course, courses, or a program from a dedicated rescue training provider. Examples include the following:

- British Columbia's Technical High Angle Rope Rescue Program (THARP)
- Technical rope rescue courses
- Industrial high angle rescue courses

These types of courses and programs vary in complexity and the types of material taught. The demands of a potential rescue should be compared to the training provided to the rescuer. If the rescuers' training does not equip them to safely perform a rescue, then additional training may be required.

Related training
Workers may have extensive training and experience with different types of rope systems. Although this training and experience may not directly qualify a worker to perform high angle rescue, it may contribute to the worker's ability to safely conduct rescue work. Examples include the following:

- Industrial rope access technician
- Cave guiding
- Mountain guiding
- Mine Rescue

The demands of a potential rescue should be compared to the training provided to the rescuer. If the rescuers' training does not equip them to safely perform a rescue, then additional training may be required.

Rescue training following NFPA or equivalent standards
In-house and third party training providers may create high angle rescue training programs based on an assessment performed under NFPA 1670, Standard on Operations and Training for Technical Search and Rescue Incidents (2017), and conforming to the requirements outlined in NPFA 1006, Standard for Technical Rescue Personnel Professional Qualifications. These standards identify three operational levels: awareness level, operations level, and technician level. The level of training should be appropriate to the type and complexity of the rescues to be performed, and should be developed and delivered by a qualified rescue professional. Standards which are equivalent to the NFPA standards can also be considered.

G4.16 Training

Issued September 1999

Section 4.16 of the *OHS Regulation* ("*Regulation*") covers the training and fitness of workers with regard to their involvement in fire prevention, evacuation and firefighting. It does not apply to a municipal fire department (including a volunteer department) or an industrial fire brigade covered by Part 31 of the *Regulation*.

Section 4.16(2) provides for "adequate training…applicable to their workplace". This provides for flexibility to adapt to the level of risk in the workplace. For example, in an office, workers would be expected to know the area fire/evacuation alarm signal and the response to be made when the signal is activated. In an industrial setting with a higher level of risk, for example where workers must use a respirator or other specialized equipment to evacuate, more instruction is required, along with the availability of the necessary equipment. If a worker is expected to be part of the "workplace response" to contain a fire or other emergency, then training and instruction should be more detailed, and clearly define the limits for response due to available equipment and training.

Section 4.16(4) requires workers assigned to firefighting to be "physically capable of performing assigned duties safely and effectively before being permitted to do them". A worker may become unfit for such duties temporarily through injury or more permanently through aging or loss of physical condition. The employer must ensure a worker is not permitted to undertake firefighting or emergency response duties if, at the time of the incident, the individual is not physically able to do the assigned duties safely and effectively.

G4.19 Physical or mental impairment – Recreational diving instructors

Issued June 26, 2014

Regulatory excerpt
Section 4.19 of the *OHS Regulation* ("*Regulation*") states:

> (1) A worker with a physical or mental impairment which may affect the worker's ability to safely perform assigned work must inform his or her supervisor or employer of the impairment, and must not knowingly do work where the impairment may create an undue risk to the worker or anyone else.
>
> (2) A worker must not be assigned to activities where a reported or observed impairment may create an undue risk to the worker or anyone else.

Purpose of guideline
This guideline provides guidance for recreational diving instructors and employers regarding fitness for work.

Regulatory requirements
Recreational diving training sessions are not occupational diving operations under the Regulation and therefore the requirements of sections 24.7-24.68 (Diving Operations) do not apply. Consequently, recreational diving instructors are not required to comply with the medical certification requirements found within these sections.

Section 4.19 of the Regulation does have application. Diving instructors that are aware of any mental or physical impairment which may affect their ability to safely perform their instructional function must inform their employer and must refrain from doing their work where the impairment may create an undue risk to themselves, the trainee divers, or anyone else.

There is a need for disclosure of impairment from any source - including prescription and non-prescription drugs, fatigue, or a medical condition.

Under section 4.19(2), the employer or supervisor is required to ensure that a recreational diving instructor with a reported or observed impairment is not assigned instructional activities where his or her ability to act as an instructor is impacted by the impairment. Instructional activities involve physical exertion and include the supervision, instruction, and safety of the students in the charge of the instructor (including in-water rescue).

Medical fitness of diving instructors
In addition to the requirements specified in section 4.19 of the Regulation, the importance of medical fitness for recreational diving instructors is also recognized by the diving profession.

The World Recreational Scuba Training Council sets standards for diving and diving safety, and its members include most prominent diving organizations. Most recreational diving instructors and assistant instructors in B.C. are members of a diving organization such as the Professional Association of Diving Instructors (PADI). Although there is no WorkSafeBC regulatory requirement for this membership, there are advantages for diving instructors to be members of these diving organizations.

Application for membership in a diving instructor organization usually requires an acknowledgement that if a member's physical condition or health changes and renders the member incapable of meeting the physical requirements of diving instruction and supervision, the member ceases instructional and supervisory duties until the required level of fitness returns, and if necessary, be cleared by a diving medical examination performed by a physician. WorkSafeBC endorses this practice.

In order to ensure that dive instructors are aware of the importance of making sure they are medically fit to dive, PADI instructors receive an annual reminder of their professional obligation to report any injuries or medical conditions when they renew their membership. In addition, PADI's quarterly professional membership publication regularly includes articles about the physical requirements of scuba diving and diving fitness.

G4.38 Work area requirements – Extreme temperatures

Issued September 1999

Section 4.38 of the *OHS Regulation* ("*Regulation*") states:

> (1) An open flame or other high temperature or extreme low temperature source or surface, which could cause a burn or other injury, must be positioned or shielded to prevent contact by workers.
>
> (2) If an extreme temperature source is necessarily exposed due to the work process, safe work procedures must be established, and workers must be instructed in those procedures and must wear appropriate clothing and personal protective equipment.

This requirement is intended to address the hazard from contact or exposure to an extreme temperature source that may cause a burn injury. Some examples are hot water and steam piping, exhaust systems, boiler and furnace surfaces, cryogenic piping and similar process equipment. It is not intended to cover heat stress or cold stress from prolonged exposure in a hot or cold environment (see Part 7 for requirements regarding these hazards), or contact with a surface made cold or hot due solely to exposure to winter or summer weather. It is expected that workers employed in hot or cold weather will be generally aware of the risks of touching hot or cold surfaces with a bare hand.

A surface above 40 degrees Celsius will potentially cause tissue damage if prolonged contact is maintained. Where section 4.38 applies, surfaces

above this temperature should be positioned or shielded to prevent contact by a worker. Prolonged contact with a surface colder than minus 10 degrees Celsius will likely cause tissue damage. Where section 4.38 applies, a surface below this temperature should be positioned or shielded to prevent contact by a worker.

G4.41 Waste material in agricultural operations

Issued January 1, 2005

Section 4.41 of the *OHS Regulation* ("*Regulation*") states:

> Refuse, spills and waste material must not be allowed to accumulate so as to constitute a hazard.

Agricultural operations may use material such as manure that in other operations or circumstances might be considered "refuse" or "waste materials." The use of such materials does not necessarily mean that section 4.41 applies. Section 4.41 applies if there is an accumulation of "waste" (in the sense of useless or discarded) material or spills of such material in an agricultural operation and a hazard is created.

Materials that are not wastes and that could be hazardous to workers are addressed by general requirements such as section 4.1, which states, among other things, that "workplaces must be maintained in such a condition that workers will not be endangered." If materials on the floor create a slippery surface, the use of non-slip footwear, as required by section 8.23, may assist with risk control.

G4.42(1) Cleaning with compressed air – Hazards of combustible dusts

Issued April 30, 2012

Regulatory excerpt
Section 4.42(1) of the *OHS Regulation* ("*Regulation*") states:

> Compressed air or steam must not be used for blowing dust, chips, or other substances from equipment, materials and structures if any person could be exposed to the jet, or to the material it expels or propels and an injury or health hazard due to fire, explosion or other cause is likely to result.

Purpose of guideline
This guideline is intended to set out the circumstances under which cleaning equipment or work areas with compressed air is permitted, and the controls that need to be put in place in order to ensure that cleaning with compressed air does not create a hazard due to fire, explosion, or other cause.

Discussion
Cleaning equipment with compressed air provides a convenient and effective way of removing small particulate matter from inaccessible areas in and around equipment and other contained work areas.

Cleaning with compressed air, however, can release combustible dusts into the air, creating an explosion hazard. Combustible dusts are fine particles that present an explosion or fire hazard when suspended in air under certain conditions. A dust explosion can cause catastrophic loss of life, injuries, and destruction of buildings.

While cleaning with compressed air can present serious risks if done incautiously, the *Regulation* does permit it, provided it is done in a way that does not create an explosion or fire hazard. Cleaning with compressed air should be minimized, however, and should only be done where other methods of cleaning are not practicable.

Managing combustible dusts
Combustible dust explosions occur when dusts are dispersed into the air in concentration and come into contact with an ignition source. Cleaning with compressed air must be done in a way that ensures that these risk elements are controlled. Cleaning must occur in a way that minimizes the amount of dust that is dispersed into the air, does not allow dusts to spread, and ensures that dusts do not come into contact with any potential source of ignition. Prior to undertaking cleaning with compressed air, employers should consider the nature of the dust created by the work process and its combustibility.

Necessary controls include

1. Minimizing dust
    - The work area, equipment, and other areas near the cleanup area (e.g., floors, sills, and other surfaces) should be swept and/or vacuumed prior to cleaning, and dust removed from the cleanup area as much as possible.
2. Minimizing dispersion
    - Cleaning with compressed air should only occur in localized or isolated areas; cleaning of a number of work areas should occur in stages.
    - Where practicable, the area should be washed with water or a water mist should be applied.
    - Compressed air pressure must be kept as low as practicable to complete the cleaning. NFPA Standard 664 *Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities* sets out a maximum of 15 psi for the use of compressed air for blowing down equipment.

- Compressed air must not be used to consolidate dust into piles or clean open areas.
- Care must be taken to ensure that the compressed air stream does not contact a dust deposit containing a "smoldering nest", which occurs when a dust deposit or layer rests on a heated surface. Dust in a deposit that has not yet burnt can form an explosive dust cloud.

3. Eliminating Sources of Ignition
   - Machinery and equipment in recent operation must be allowed to cool prior to blowdown, and other hot surfaces must be identified and cooled or removed.
   - Electrical equipment in the area must be deenergized and locked out.
   - Sources of open flame, sparks, or static discharge must be identified and eliminated.
4. Emergency Response
   - Fire protection equipment must be readily available and in service.

The NFPA Standard 654 *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids* provides more information on managing combustible dusts in all phases of the manufacturing, processing, blending, pneumatic conveying, repackaging and handling of combustible particulate solids or hybrid mixtures, and also provides more detail on cleaning with compressed air.

G4.1.1 Snow avalanche assessment

Issued September 1, 2009; Revised February 1, 2011; Revised September 1, 2011; Editorial Revision January 1, 2014; Revised consequential to February 1, 2015 Regulatory Amendment

Regulatory excerpt
Section 4.1.1 of the *OHS Regulation* ("*Regulation*") states:

> (1) In this section and section 4.1.2:
>
> *"avalanche"* means snow avalanche;
>
> *"avalanche risk assessment"* means the assessment referred to in subsection (2)(a);
>
> *"avalanche safety plan"* means the plan referred to in subsection (2)(b);
>
> *"avalanche safety program"* means the program referred to in subsection (6).
>
> (2) Subject to section 4.1.2, if a person working at a workplace may be exposed to a risk associated with an avalanche, the employer must ensure that no work is carried out at the workplace until
>
> (a) a written avalanche risk assessment is completed, and
>
> (b) if the avalanche risk assessment indicates that a person working at the workplace will be exposed to a risk associated with an avalanche, a written avalanche safety plan is developed and implemented.
>
> (3) The avalanche risk assessment must be conducted by a qualified person.
>
> (4) In conducting the avalanche risk assessment, the qualified person must consider all of the hazards and risks associated with an avalanche, including, without limitation, the following:
>
> (a) the topography and vegetation in the area of the workplace;
>
> (b) the snow conditions in the area of the workplace;
>
> (c) the history of avalanches in the area of the workplace;
>
> (d) the nature and duration of work activities to be carried out at the workplace;
>
> (e) the extent, if any, to which the nature and duration of work activities to be carried out at the workplace may affect the topography, vegetation or snow conditions in the area of the workplace;
>
> (f) the nature of the workplace and the buildings and structures at the workplace.
>
> (5) The avalanche safety plan must be developed by a qualified person and, subject to subsection (6), must include measures to eliminate the risks associated with an avalanche.
>
> (6) If eliminating the risks associated with an avalanche is not practicable, the avalanche safety plan must include measures and procedures to minimize those risks, including an avalanche safety program that provides for
>
> (a) the regular monitoring of weather, snow and avalanche conditions in the area of the workplace, at intervals the qualified person considers will be effective,

(b) the implementation of closures or other measures, as specified in the avalanche safety program, and

(c) safe work procedures to be followed by persons working at the workplace.

(7) The employer must make a copy of the avalanche safety program readily available to each person who administers or implements the avalanche safety program for the workplace.

(8) Whenever there is a significant change in the hazards or risks associated with an avalanche in the area of the workplace, the employer must do the following, unless the change is already addressed by the avalanche safety plan:

(a) ensure that a qualified person reviews the avalanche risk assessment and the avalanche safety plan;

(b) make changes to the avalanche risk assessment and the avalanche safety plan, as considered necessary by the qualified person, to reflect the current hazards and risks associated with an avalanche in the area of the workplace.

(9) If the avalanche safety plan includes procedures applicable to a person's work at the workplace,

(a) the employer must provide information and training to the person respecting the procedures, and

(b) the person must comply with the procedures.

Section 4.1.2

(1) Section 4.1.1 does not apply to work carried out to evaluate whether a person working at the workplace may be exposed to a risk associated with an avalanche.

(2) Section 4.1.1 does not apply if compliance with that section is not practicable when carrying out the following types of work at a workplace where a person may be exposed to a risk associated with an avalanche:

(a) work that

(i) is carried out intermittently,

(ii) involves moving through the workplace without stopping for a significant length of time in a particular area of the workplace, and

(iii) has minimal potential to trigger an avalanche;

(b) work related to an emergency;

(c) work carried out to complete an avalanche risk assessment;

(d) work carried out to develop an avalanche safety plan.

(3) Before a person carries out work to which subsection (2) applies, the employer must ensure that

(a) written safe work procedures are in place to minimize the risks associated with an avalanche, and

(b) the person

(i) understands the risks associated with an avalanche, and

(ii) is trained in the procedures referred to in paragraph (a) of this subsection.

(4) The safe work procedures required under subsection (3) must be developed by a qualified person and must set out the following:

(a) the qualifications and training a person must have in order to be eligible to carry out work to which subsection (2) applies;

(b) the procedures the person referred to in paragraph (a) of this subsection must follow to identify and address risks associated with an avalanche;

(c) the requirements the person referred to in paragraph (a) of this subsection must comply with when using equipment.

(5) A person carrying out work to which subsection (2) applies must comply with the safe work procedures required under subsection (3).

Purpose of guideline
The purpose of this guideline is to explain the difference between the avalanche risk assessment and the ongoing monitoring of weather, snow, and avalanche conditions, and to clarify when the exceptions under section 4.1.2 apply.

Background
Amendments to section 4.1.1 came into effect on February 1, 2015. The requirements set out in section 4.1.1 apply to any workplace where there

is or may be a risk from a snow avalanche to a person working there. Some examples of the industries to which this section applies include: ski hills, forest operations, land surveying, pipelines situated entirely within the province, eco-tourism (e.g., snowmobile and mountain guiding), power generation and transmission, property development, and lodging.

Avalanche risk assessment
Section 4.1.1(2) of the *Regulation* requires an avalanche risk assessment to be conducted before work commences in a workplace where there may be a risk from a snow avalanche to a person working there. The avalanche risk assessment must be conducted by a qualified person. Section 4.1.1(4) outlines hazards and risks that must be considered when conducting the assessment. This is not an exhaustive list – all other risks and hazards relating to a snow avalanche will need to be considered as part of the assessment.

The purpose of the avalanche risk assessment is to determine the potential for snow avalanches to affect the workplace, and to generate options for risk mitigation. This is an investigative assessment, which includes consideration of factors such as terrain, snow conditions, and history of avalanche events.

This initial, one-time risk assessment is distinct from the ongoing monitoring of weather, snow, and avalanche conditions that is required under section 4.1.1(6) to evaluate the current level of risk and guide operational decisions. In other words, an avalanche risk assessment is completed once during the planning stage of the operation (and reviewed as required by section 4.1.1(8)), whereas the regular monitoring of conditions takes place at intervals established by the qualified person.

The initial avalanche risk assessment that must be conducted under section 4.1.1(2) and the subsequent, ongoing monitoring of conditions under section 4.1.1(6) each requires a unique set of skills and qualifications. While the same person may possess all of those skills and qualifications, often times there will be a need for two separate individuals: one to conduct the initial avalanche risk assessment, and another to carry out the regular monitoring that will guide operational decisions.

Avalanche risk assessment and safety plan exceptions
Sections 4.1.2(1) and (2) provide exceptions to the requirements of section 4.1.1.

Exception 1
Section 4.1.2(1) applies to work carried out to evaluate whether a person working at the workplace may be exposed to a risk associated with an avalanche. In this situation, there is no need to conduct an avalanche risk assessment or develop an avalanche safety plan until after a determination has been made.

Exception 2
The purpose of section 4.1.2(2) is to account for situations where it is not practicable to formalize a written risk assessment prior to the worker entering the workplace due to the nature of the work being performed.

In cases where section 4.1.2(2) applies, the *Regulation* still requires safeguards against the risks associated with a snow avalanche. The requirements outlined in sections 4.1.2(3), (4), and (5) include safe work procedures developed by a qualified person, compliance with those procedures, and worker training.

"Practicable" is defined in section 1.1 of the *Regulation* as "that which is reasonably capable of being done." Determining whether or not it is practicable to comply with section 4.1.1 requires an objective test based on what a reasonable person with full knowledge of the situation would determine in the circumstances. That person will need to have adequate training, education, and experience in order to be knowledgeable of the work and the hazards.

For this exception to apply, in addition to compliance not being practicable, the work must fall within one of the categories described in section 4.1.2(2) as follows:

- The work is carried out intermittently, involves moving through the workplace without stopping for a significant length of time in a particular area of the workplace, and has minimal potential to trigger an avalanche
- The work is related to an emergency
- The work is carried out to complete an avalanche risk assessment or avalanche safety plan

It will generally not be considered practicable to comply with the requirements of section 4.1.1 where the work involves transitory, short-duration, low-impact activities within a large backcountry terrain base. Conducting a detailed historical risk assessment will not be reasonably achievable in those circumstances. In contrast, if the work operations are fixed, even within expansive terrain, it will be considered practicable to comply with section 4.1.1. Similarly, section 4.1.1 will apply when operating on regular work access or touring routes.

Intermittently
In order for the exception under section 4.1.2(2)(a) to apply, all of the following four conditions must be met:

- The work is carried out intermittently
- The work involves moving through the workplace without stopping for a significant length of time in a particular area of the workplace
- The work has minimal potential to trigger an avalanche
- It is not practicable to comply with section 4.1.1

For the purposes of section 4.1.2(2)(a), work that is carried out "intermittently" refers to activities that are occasional, sporadic, and not performed routinely. Work that is repetitive, within the same area, and capable of being scheduled and planned (for example, the grooming of regular trails or

routes) will not qualify for this exception, regardless of frequency.

Emergency
For the purposes of section 4.1.2(2)(b), emergency work is limited to activities carried out to rescue workers or other persons (and equivalent situations) in an area for which it was not practicable to conduct a formal avalanche risk assessment or develop an avalanche safety plan.

The "emergency work" exception does not apply to work undertaken to repair or replace damaged infrastructure. Given that this work involves fixed facilities, it will be practicable to conduct an avalanche risk assessment and develop an avalanche safety plan in advance.

G4.3(2) Welding repair of forks and fork extensions on lift trucks

Issued August 1999; Editorial Revision April 2005; Revised April 30, 2015

Regulatory excerpt
Section 4.3(2) of the *OHS Regulation* ("*Regulation*") states:

> Unless otherwise specified by this Regulation, the installation, inspection, testing, repair and maintenance of a tool, machine or piece of equipment must 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.

Purpose of guideline
This guideline describes the engineering requirements for welding repair on forklift forks and fork extensions on lift trucks.

Welding repair of forks and fork extensions
Section 16.3 (Operation and maintenance) of the *Regulation* sets out various requirements related to maintenance records, servicing, and use of mobile equipment. Section 4.3(2) of the *Regulation* requires, among other things, that the repair of mobile equipment be done in accordance with manufacturer's instructions and requirements of applicable standards, or in the absence of such instructions, as specified by a professional engineer.

The use of forks and fork extensions repaired by welding is acceptable when a professional engineer has certified the completed weld repair as adequate. If the engineer's certification requires the load capacity for the lift truck to be reduced, the load rating markings and the machine manuals should be changed to reflect the reduced load capacity. *Regulation* sections 4.8 and 16.20 apply. (Refer also to OHS Guideline G16.19).

Forks and fork extensions on lift trucks should not be used after weld repair until the engineering certification is available. If the required certification for the weld repair is not available, the lift truck should be removed from service until the repair work is properly certified and the manuals adjusted as necessary, or until the fork or fork extension is replaced by a compatible one warranted by the manufacturer or a professional engineer. In the latter case, the installation of the forks or fork extensions is covered by section 16.19 of the *Regulation*, which requires installation as specified by the equipment manufacturer or when certified by a professional engineer for use on the equipment.

G4.8 Rated capacity of truck-mounted cranes

Issued May 6, 2009

Regulatory excerpt
Section 4.8 of the *OHS Regulation* ("*Regulation*") states:

> (1) Unless provided elsewhere in this Regulation, the rated capacity or rated load of a machine or piece of equipment is that specified by the manufacturer of the machine or piece of equipment based on its design.
>
> (2) The rated capacity or rated load must be certified by a professional engineer if
>
> (a) the manufacturer's specification or other acceptable warranty cannot be produced,
>
> (b) the equipment or machine has been modified in a manner which will change its rated capacity or rated load,
>
> (c) wear, corrosion, damage or signs of fatigue are found which may reduce the rated capacity or rated load,
>
> (d) the equipment or machine is used in a manner or for a purpose other than that for which it was originally designed, if the use will change the safe working load, or
>
> (e) in the opinion of the Board, the provision of such certification is deemed necessary.

Purpose of guideline
This guideline provides guidance for users and suppliers of truck-mounted cranes, specifically for the requirement and the responsibilities to provide and ensure stability testing and provision of load charts.

Types of truck-mounted cranes and testing requirements
Cranes mounted on carriers are either designed and supplied by a crane manufacturer as a unit (*integral unit*), or the crane is mounted on a carrier provided by an end user (*combination unit*). The requirements for stability testing and provision of load charts include the following:

A. Integral Unit
When the manufacturer designs and supplies an integral unit, all components (the frame, axles, tires, and crane) complement each other and the manufacturer provides load chart(s) appropriate for the completed product. The load chart will have been determined by the crane manufacturer based on the stability of the integral unit and on the factors other than stability that may limit the capacity (e.g., frame strength). These units typically have a telescopic or a lattice boom.

The manufacturer will perform a practical stability test as described by the *Crane Load Stability Test Code - SAE J765* (*SAE J765*), published in the SAE Handbook, to ensure the crane will remain stable when used in accordance with the supplied load chart. These are normally *type* tests; that is, only one of a number of identical units is tested.

For an *integral unit* with a suitable manufacturer-supplied load chart, it is not necessary for a new or updated load chart to be produced, or for stability testing to be re-done, until and unless one of the conditions in *Regulation* subsections 4.8(2)(a) - (e) occurs.

B. Combination Unit
When an end user supplies the carrier and a crane is mounted to it, different manufacturers have produced equipment independently of each other without specific knowledge of each other's design characteristics (structural, hydraulic, and/or mechanical).

The crane manufacturer cannot provide a load chart(s) that considers the stability of the combined crane and carrier or the ability of the carrier to support the crane. The load chart provided by the crane manufacturer is the maximum that could be expected from that equipment but it may have to be reduced if the carrier to which it is mounted is incapable of supporting the crane loaded to the crane manufacturer's indicated capacity.

These *combination units,* where the crane and carrier units have been discretely designed and manufactured, could be articulating boom (knuckleboom) trucks or telescopic boom trucks. They can only be tested for stability after the crane has been mounted to the carrier. The tests performed must be *unit* tests; that is, each boom and carrier set is tested for stability. The load chart for the combined crane and carrier needs to show the capacity that is the lower of that determined from the stability testing and the capacity that was provided by the boom manufacturer.

The load chart needs to show the capacity relative to the portion of the swing circle to which it applies in a work area diagram. For example, the load chart may be applicable for 360° of swing or there may be a reduction in some portions of the swing circle compared to others. In some cases, there may be zero capacity in some portions of the swing circle.

ASME B30.22 Articulating Boom Cranes requires that a *unit* test, not a *type* test, is performed. The same rationale that is the basis for this *ASME B30.22* requirement applies for telescopic boom trucks. That is, for both articulating boom and telescopic boom truck cranes, and pursuant to *Regulation* subsection 4.8(2)(e), WorkSafeBC deems it necessary for each *combination unit* to undergo the testing described in *SAE J765*.

The ability of the carrier frame and attachment to safely support the loads shown in the load chart(s) is also to be verified by a professional engineer for each *combination unit*. This verification of structural competence for the hoist capacity is required in addition to the stability test.

Applicable *Regulation* sections and standards
The regulatory requirements for stability testing and load charts are found in the following *Regulation* sections:

Regulation subsection 4.8(2)(a) requires that the rated capacity or rated load be certified by a professional engineer whenever the manufacturer's specification or other acceptable warranty cannot be produced. This will be the case for each *combination unit* produced.

Regulation section 14.2 references the standards that crane equipment must meet. The North American safety standards for mobile cranes (including boom trucks), *CSA Z150 Code for Mobile Cranes*, *ASME B30.5 Mobile and Locomotive Cranes* and *ASME B30.22 Articulating Boom Cranes* all require stability testing that follows *SAE J765* to determine the ratings that are limited by stability. The standards require a work area chart that defines the portions of the swing circle in relation to reduced areas of capacity or indicates that the rated capacities are independent of the boom location on the swing circle. *SAE J765* describes the test procedure and conditions to ensure all mobile cranes are tested in the same way.

Regulation subsection 14.5(3) requires that the load chart be permanently posted on the crane or be issued to the crane operator who must keep it available at all times when operating the crane. The load chart must indicate the rated capacity for the crane for the working positions and configurations in use and must be in a legible condition. This requirement applies to both *integral* and *combination* units. The load chart has a chart number that relates to the specific truck-crane unit.

Responsibilities
Under the *Workers Compensation Act* ("*Act*") section 120 General duties of suppliers, every supplier must ensure that any tool, equipment, machine, or device supplied by the supplier is safe when used in accordance with the directions provided by the supplier and complies with Part 3 of the *Act* and with the *Regulation*. This means that the supplier has responsibility to ensure provision of a suitable load chart(s) based on stability testing with the completed unit. For the case of an *integral unit*, there will be an identified supplier of the unit. For the case of a *combination unit* assembled and sold by a distributor, this distributor (assembler) is the supplier of the equipment. For the case of a *combination unit* assembled for use by an employer, there exists a supplier for the carrier and a supplier for the crane. In this case, the responsibility to ensure provision of the appropriate load chart(s) for the *combination unit* is with the employer.

With respect to the rated capacity of a truck-mounted crane, the employer needs to ensure that the proper load chart is available as per *Regulation* section 4.8 and subsections 14.2(5), and 14.5(3). The load chart may be manufacturer-supplied for an *integral unit*, and will be as certified by a professional engineer for a *combination unit*. The employer must also ensure that a new load chart is provided by a professional engineer when required by circumstances described in *Regulation* subsections 4.8(2)(a) - (e). Operators of truck-mounted cranes must be adequately trained to use the equipment in accordance with the load chart(s).

A professional engineer who performs stability testing needs to ensure the testing is performed in accordance with applicable standards. Stability testing needs to be performed in accordance with *SAE J765*. The load ratings provided as a result of the testing may not exceed those specified by the crane manufacturer (i.e. the load ratings based on factors other than stability).

With respect to the rated capacity of a truck-mounted crane, the operator of the unit must use the equipment in accordance with training and with instructions provided, and must report unsafe or harmful conditions to the employer (also see Part 14 requirements, e.g., for inspection, maintenance, repair, modification, record keeping).

G4.9 Inspection and maintenance records

Issued September 1999; Revised June 3, 2002; Editorial Revision April 4, 2007; Editorial Revision February 1, 2008; Editorial Revision February 15, 2019

Regulatory excerpt
Section 4.9 of the *OHS Regulation* ("*Regulation*") states:

> (1) If this Regulation requires a machine or piece of equipment to have an inspection and maintenance record, then an effective written or other permanent recording system or log must be immediately available to the equipment operator and to any other person involved with inspection and maintenance of the equipment.
>
> (2) The recording system must
>
> (a) identify the make, model and serial number of the equipment, and the name and address of the current owner,
>
> (b) contain an entry on each shift, signed by the operator of the machine or equipment, reporting the result of each start of shift inspection and safety check, and any observed defect, operating difficulty or need for maintenance occurring on the shift, and
>
> (c) contain an entry signed by the person responsible for any test, inspection, modification, repair or maintenance performed on the equipment, summarizing the work done, indicating the status of the equipment or machine for further use, and if appropriate, noting where a detailed record of the test, inspection, modification, repair or maintenance can be obtained.
>
> (3) If this Regulation requires a machine or piece of equipment to have inspection and maintenance records, then detailed reports of inspection, maintenance, repairs and modifications must be kept for the duration of the service life of the machine or equipment and must be reasonably available to the workplace and made available, upon request, to the operator and to anyone else involved in the operation, inspection, testing or maintenance of the equipment.

Purpose of guideline
The purpose of this guideline is to

- Clarify the application of section 4.9 of the *Regulation*
- Interpret "immediately available" under section 4.9(1)
- Interpret the term "signed " under section 4.9(2) where a computer-based record system is being used
- Describe the intent of section 4.9(3) and its use of "reasonably available"

Application of section 4.9
Section 4.9 applies if another section of the *Regulation* requires a machine or piece of equipment to have an inspection and maintenance record. The following are examples of sections of the *Regulation* that require a specified machine or piece of equipment to have an inspection and maintenance record. Therefore, the machines and pieces of equipment in the table are examples of those for which inspection and maintenance records must be maintained to the criteria set out in section 4.9.

Section 4.83(6)	- an exhaust ventilation system or an air cleaning system in a designated smoking room
Section 12.77	- automotive lift
Section 13.22	- swing stage - permanent powered platform - elevating work platform
Section 14.14	- a crane or hoist with a rated capacity of 900 kg (2000 lb) or more - a crane or hoist used to support a worker - a tower crane - a mobile crane, boom truck, or sign truck

	- a side boom tractor or pipe layer - a construction material hoist - a chimney hoist - any other type of hoist specified by WorkSafeBC
Section 16.3	- a rough terrain forklift
Section 20.29	- a concrete placing boom or mast

"Immediately available"
Section 4.9(1) also states that the record must be "immediately available to the equipment operator and to any other person involved with inspection and maintenance of the equipment." This means that the operator, and maintenance and inspection personnel, must be able to make entries, review entries and display the records to someone (such as a supervisor, joint health and safety committee representative, or WorkSafeBC prevention officer) without leaving the workplace.

If a "log book" is used, the book must be on the site, but not necessarily in the possession of the operator or in the cab of the equipment. The book must be readily available at the workplace for entries to be made and for inspection. It should be kept where it is secure and protected from the weather. If an electronic or computerized system is used, the operator and others required to make entries must be able to readily do so from a terminal at the worksite. The operator must also be able to display the records at the workplace for inspection by a supervisor, prevention officer, member of the joint health and safety committee, or other authorized person making a health- or safety-related inspection.

"Signed"
Section 4.9(2) requires that each entry in the record be "signed." If a computer-based record system is being used, each entry must include a unique identifier that is password protected, so the person responsible for making an entry can be traced, and so a person cannot make or remove an entry made by someone else.

"Reasonably available"
Section 4.9(3) states "detailed reports of inspection, maintenance, repairs and modifications must be … reasonably available to the workplace." The intent of section 4.9(3) is to allow the detailed originals of reports and certifications to be stored away from the workplace, as long as the material is available and can be produced, and is referenced in the log book available at the workplace. The detailed reports must be maintained so the records, or a requested part of them, can be produced for inspection at the worksite on request of an authorized person or prevention officer. This could be done, for example, by fax delivery to the site.

If there is a question on the status of equipment to perform safely because of missing or incomplete records, a prevention officer may stop use of the equipment until the appropriate records are produced to indicate compliance with the *Regulation*. For example, if there is a missing or inadequate record, for a required annual certification or for a repair to a critical area of the equipment, and the prevention officer considers there is an immediate danger to workers if the equipment continues to be used, a closure order may be issued.

G4.11 Putting equipment, machinery, and work processes into operation

Issued June 18, 2008

Regulatory excerpt
Section 4.11 (Startup) of the *OHS Regulation* ("*Regulation*") states:

> Before any equipment, machinery or work process is put into operation the persons responsible for doing so must ensure that
>
> (a) safeguards and air contaminant controls required by this Regulation are in place and functioning, and
>
> (b) no person will be exposed to undue risk by putting the equipment, machinery or work process into operation.

Purpose of guideline
This guideline

- Clarifies the circumstances in which section 4.11 applies
- Outlines some other provisions that also apply to putting equipment into operation
- Clarifies some of the terms that are covered in section 4.11
- Discusses the means of compliance with section 4.11 and related provisions
- Outlines some requirements that apply to start of shift checks

Circumstances in which section 4.11 applies
This requirement applies basically to the startup of newly commissioned equipment, machinery, or processes, and in cases where they are returned to service, for example, after being dormant for a period of time, after repairs, or if they have been modified from the original design specifications. Start of shift requirements are typically covered by other sections of the *Regulation*.

The obligations under section 4.11 of the *Regulation* are limited to ensuring required safeguards and air contaminant controls are in place, and no person is put at undue risk. The responsibility for compliance under section 4.11 applies to the employer and workers at the site who may be

assigned responsibilities, such as operators or mechanics; and to other persons such as supplier representatives, consultants, and commissioning engineers, where applicable.

The requirement applies to fixed devices in workplaces, such as conveyers, presses, and auto-lifts, but also includes powered portable and mobile equipment. It does not apply to hand tools such as hammers, handsaws, and the like.

Other requirements that apply to putting equipment into operation
Section 4.11 should be viewed in the context of other requirements of the *Regulation* that apply to putting equipment into operation. For example, section 4.3 (Safe machinery and equipment), is a broader requirement that covers issues ranging from selection, through to operation, inspection, repair, and maintenance. In addition some requirements, particularly in Parts 12 to 16 of the *Regulation*, specify adherence to certain standards for particular kinds of equipment. Some of those standards contain provisions related to putting equipment into operation. (*The* Regulation *specifies standards only for a limited number of types of equipment. There are standards for other types of equipment that are not referenced in the* Regulation *and hence are not mandatory. The employer may, however, find such standards to be useful sources of information.*)

Section 4.11 should also be viewed in the context of section 120 of the *Workers Compensation Act* ("*Act*"), which contains important obligations for suppliers of equipment to the workplace.

Clarification of terms
Section 4.11 refers to terms such as

- "*Safeguards,*" which, under section 12.1 of the *Regulation* 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.
- "*Air contaminant controls,*" which typically refers to effective ventilation to control harmful contaminants (e.g., see section 5.64 of the *Regulation*), but may also include other means such as spray water mists, barriers to air contaminant movement from the source, and temperature controls.

Ensuring compliance with section 4.11 and other related provisions
The means of complying with the requirements of section 4.11 and other provisions applicable to putting equipment into operation will vary somewhat depending on whether the equipment, machinery, or process is new, or is being returned to service.

New equipment, machinery, or processes: The term "new" as used in this guideline applies to any equipment, machinery, or process that is being used in the workplace for the first time, regardless of whether it has been previously used. When originally being commissioned in a workplace there are a number of considerations in ensuring safety including

- A review of the requirements of the *Regulation* for safeguards and air contaminant controls to ensure they are met
- Assurance that work procedures are in place for the protection of workers
- Assurance that no worker could be at undue risk when the equipment is put into operation. This will include, as applicable, ensuring steps have been taken to ensure no failure of the equipment will occur or other failure, such as the support structure for it.
- Conformity with any manual or other instructions provided by the supplier of the device, as required under section 4.3 of the *Regulation*

It should be noted that suppliers, as well as employers, have obligations to ensure worker safety. A supplier, as defined by the *Act*, is a person who manufacturers, supplies, sells, leases, distributes, erects, or installs any tool, equipment, machine, device (or any biological, chemical, or physical agent) to be used by a worker.

Under section 120 of the *Act*, a supplier must, among other things

- Ensure that any equipment, machine or device supplied by the supplier is safe when used in accordance with the directions provided by the supplier and complies with Part 3 of the *Act* and the *Regulation*
- Provide directions for the safe use of any equipment, machine or device that is obtained from the supplier to be used at a workplace by workers
- If the supplier has responsibility under a leasing agreement to maintain any tool, equipment, machine, device or other thing, they must maintain it in safe condition and in compliance with Part 3 of the *Act*, the *Regulation*, and any applicable orders.

Section 120 of the *Act* is clear on the issue of directions for safe use. Such directions must be provided in each case where a piece of equipment, machine, or device is supplied to the workplace for use by a worker.

Equipment, machinery, or process being returned to the workplace: In this scenario, the device would have been used previously in the workplace, and is being returned to service at the workplace after a time interval. Typical examples include equipment, machinery, or processes that have been dormant for a period of time, have undergone repairs or modification, or have been shutdown for maintenance where procedures may involve lockout, and temporary removal of safeguards or air contaminant controls. Because steps should have been taken to ensure compliance with section 4.11 and related requirements at the original commissioning stage, ensuring compliance may be more straightforward in this case.

However, the employer should ensure that all considerations used for new devices are checked off when the devices are returned to service, and that any additional considerations are addressed, where required, related to repairs or modifications.

Start of shift inspections

Typically, other provisions of the *Regulation* apply to start of shift inspections. General provisions include sections 3.5 (Workplace inspections - general requirement), and 4.3 (Safe machinery and equipment).

Under section 3.5, to prevent development of unsafe conditions in some cases, inspections may need to be made at the beginning of each shift. Under section 4.3, manufacturer instructions or safe work practices may mandate start of shift checks.

Start of shift requirements for specific types of equipment can be found in other Parts of the *Regulation*, for example

- Part 11 - various types of fall protection equipment
- Part 12 - some specific types of equipment and processes, such as abrasive blasting or high pressure washing
- Part 13 - ladders, window cleaners' belts and work platforms
- Part 14 - cranes and hoists
- Part 16 - all types of mobile equipment
- Part 17 - worker transport vehicles

This list is not comprehensive, but is intended to provide an indication of the breadth of start of shift requirements in the overall *Regulation*.

G4.55 Guardrails on work platforms

Issued December 2, 2011; Retired consequential to May 1, 2017 regulatory amendment

G4.58(4)(b) Prior approval for fibre and wire rope guardrails

Retired February 1, 2011

Prior approval is no longer needed; see Schedule 4–A of the Occupational Health and Safety Regulation: WorkSafeBC Standard – Guardrails using rope or other non-rigid material.

G4.59 Floor and roof openings

Issued March 7, 2011

Regulatory excerpt
Section 4.59(1) and (4) of the *OHS Regulation* ("*Regulation*") states:

> (1) A pit or other opening in a floor, walkway, roof or other area accessible to workers, which is a danger to workers, must be securely covered with a cover of adequate size and strength or guarded by fixed or movable guardrails, which must be identified as such and kept in place except when necessarily removed to work in the opening or pit.
>
> …
>
> (4) If a worker must enter an area not normally accessible and that has openings that are a danger, such openings must be guarded or personal fall protection must be used while the worker is in the area.

Purpose of guideline
The purpose of this guideline is to clarify the status of skylights as roof openings, and explain the application of section 4.59(1) of the *Regulation* to situations where work is being performed on roofs and other surfaces that are equipped with skylights.

Floor and roof openings
Workers commonly access roofs equipped with skylights for the purpose of inspection, maintenance, and other activities. There is some question as to whether skylights constitute an adequate cover as contemplated by this section.

The *British Columbia Building Code (2006)* references standards that apply to skylights, and these standards include human impact safety requirements. However, it is difficult to determine, based on observation, what standard a particular skylight is manufactured to, whether it is appropriately rated, or its actual condition.

Unless the employer can demonstrate that a skylight is strong enough to act as an adequate cover for workers, the skylight must be adequately covered and guarded by fixed or moveable guardrails. Alternatively, a system of personal fall protection may also be used as noted in section 4.59(4) of the *Regulation*.