

Understanding the Requirements for Mobile Logging Equipment in British Columbia

In recent years, the landscape of logging operations in British Columbia has changed, and there has been an increase in the availability of new harvesting equipment manufactured in Europe and elsewhere. As a result, B.C. logging companies have been looking overseas for new machines for their operations. Employers and manufacturers have a responsibility to ensure that equipment meets all regulatory requirements before it is used in B.C. The purpose of this document is to help employers, suppliers, manufacturers, distributors, and importers of logging equipment understand the requirements in the *Workers Compensation Act* and the Occupational Health and Safety Regulation that relate to mobile equipment used in B.C.

Please note that this document is not a complete listing of all workplace requirements. It is only intended as a guide to the main regulatory requirements and standards that need to be considered for mobile equipment. Additional requirements may apply and may vary depending on the specific equipment and the way it is used. It is recommended that employers and manufacturers review all relevant parts of the Regulation. The sections most directly applicable to logging equipment operations are in Parts 15, 16, and 26 of the Regulation.

Employers and manufacturers should also be aware that WorkSafeBC doesn't have an approval process for evaluating and endorsing new equipment. WorkSafeBC does not approve equipment for use, though we have resources that may help explain some of the regulatory requirements (for example, industry health and safety manuals, and guidelines to the Regulation). Employers, manufacturers, and suppliers are responsible for determining whether equipment is suitable and complies with the Regulation and any other applicable legal requirements.

Note

The section numbers in the headings of this document refer to specific sections in the Occupational Health and Safety Regulation, unless the heading specifically indicates that it is a section from the *Workers Compensation Act*.

Supplier responsibilities

Section 120 of the Act describes the basic responsibilities of suppliers, which includes suppliers, manufacturers, distributors, and importers of mobile logging equipment.

Workers Compensation Act, section 120, General duties of suppliers

Every supplier must

- (a) ensure that any tool, equipment, machine or device, or any biological, chemical or physical agent, supplied by the supplier is safe when used in accordance with the directions provided by the supplier and complies with this Part and the regulations,
- (b) provide directions respecting the safe use of any tool, equipment, machine or device, or any biological, chemical or physical agent, that is obtained from the supplier to be used at a workplace by workers,
- (c) ensure that any biological, chemical or physical agent supplied by the supplier is labelled in accordance with the applicable federal and provincial enactments,
- (d) if the supplier has responsibility under a leasing agreement to maintain any tool, equipment, machine, device or other thing, maintain it in safe condition and in compliance with this Part, the regulations and any applicable orders, and
- (e) comply with this Part, the regulations and any applicable orders.

Guards

Mobile equipment used in B.C. must be equipped with guards that meet the requirements of the Regulation and applicable standards. Guards include structures that protect operators from being struck by logs and other objects, and rollover protective structures (ROPS).

Section 16.21, Protective structures

- (1) Operators of mobile equipment must be protected against falling, flying or intruding objects or material by means of suitable cabs, screens, grills, shields, deflectors, guards or structures.

Section 16.22, Rollover protective structures

- (1) The following types of mobile equipment, weighing 700 kg (1 500 lbs) or more, must have rollover protective structures (ROPS):
 - (a) crawler tractors, loaders and skidders;
 - (b) wheel tractors, dozers, loaders and skidders;
 - (c) motor graders;
 - (d) self-propelled wheel scrapers;
 - (e) compactors/rollers;
 - (f) self-propelled rock drills moved by an on-board operator;
 - (g) wheeled trenchers manufactured after January 1, 1999;
 - (h) pipe layers or side boom tractors manufactured after January 1, 2000.
- (2) The Board may require a ROPS to be installed on any mobile equipment if the design of the equipment or circumstances of use indicate the need.

Guarding requirements

When considering new equipment, compare it with the G600 series of standards for direction on guarding requirements. (See “Standards and Guidelines” on page 11.) For example, a new machine that falls timber has the same risks related to protruding objects as a feller buncher, so the same guarding package will be required; a machine that forwards or skids will have the same guarding requirements as a line or grapple skidder.

For equipment that uses guarding standards not currently acceptable to WorkSafeBC, manufacturers will need to test and demonstrate to ensure that the guarding is equivalent.

Guarding requirements for mobile equipment that falls timber are specified in the following standards and regulations:

- Cab — WCB Standard G602
- Roof — WCB Standard G608 or SAE231
- Boom side — WCB Standard G604 or SAE J1084
- Front — WCB Standard G603 and G604

- Door and door side windows — WCB Standard G603 and G604
- Back window — WCB Standard G603 and G604
- Emergency Escape — section 16.17 of the Regulation

Emergency escape

If a piece of mobile logging equipment has only one cab door, the equipment will require an emergency escape exit that meets the requirements of sections 16.17(1)(a) to (f) of the Regulation if it was manufactured after January 1, 2000. If a piece of mobile logging equipment was manufactured before January 1, 2000, it must have an alternate means of escape in case the primary exit becomes blocked. (See “Standards and Guidelines” on page 11.)

Section 16.17, Escape from a cab

- (1) Mobile equipment with a single cab entrance door, manufactured after January 1, 2000, must have an alternate means of escape that is clearly marked both inside and outside the cab and which
 - (a) is not located on the same surface as the cab entrance door,
 - (b) is usable regardless of the position of movable components or accessories of the machine,
 - (c) does not pose additional hazards to the operator,
 - (d) can be opened from both the inside and outside without the use of tools when the equipment is in use,
 - (e) requires a force of not more than 135 N (30 lbs) to open, and
 - (f) provides a clear opening of at least 65 cm (26 in) in diameter if circular, 60 cm (24 in) on each side if square, and 47 cm by 65 cm (19 in by 26 in) if rectangular, or the dimensions of which comply with *ISO Standard 2867-1994, Earth-Moving Machinery – Access Systems*.
- (2) Mobile equipment with a single cab entrance door, manufactured before January 1, 2000, must meet the requirements for an alternate means of escape required at the date of manufacture, unless otherwise directed by the Board.

For further discussion of the requirements in section 16.17, see [guideline G16.17, Alternate means of escape – Purpose-built window breaking device](#).

Slope limitations

Operating mobile logging equipment on steep slopes carries a degree of risk that tends to increase as the slope becomes steeper. While some mobile logging equipment may be manufactured specifically for steep-slope operations and suitable for such use, all equipment has productivity and safety limitations.

Section 26.12.1, Equipment capabilities

- (1) Any equipment designed for a specific function in a forestry operation or adapted for use in a forestry operation must be capable of performing safely the functions for which it is being used.
- (2) The requirements of subsection (1) are met if the equipment is used
 - (a) in accordance with the manufacturer's instructions,
 - (b) as specified by a professional engineer, or
 - (c) in a manner acceptable to the Board.

Section 26.16, Slope limitations

- (2) If the manufacturer's maximum slope operating stability limit for logging equipment is known, the equipment must be operated within that limit.
- (3) If the manufacturer's maximum slope operating stability limit for logging equipment is not known, the equipment must be operated within the following limits:
 - (a) a rubber tired skidder must not be operated on a slope which exceeds 35%;
 - (b) a crawler tractor, feller buncher, excavator and other similar equipment must not be operated on a slope which exceeds 40%;
 - (c) any other forestry equipment specifically designed for use on a steep slope must not be operated on a slope which exceeds 50%.
- (4) Despite subsections (2) and (3) but subject to subsection (5), logging equipment may be operated beyond the maximum slope operating stability limits specified in those subsections if
 - (a) a qualified person conducts a risk assessment of that operation, and
 - (b) written safe work practices acceptable to the Board are developed and implemented to ensure the equipment's stability during operation.
- (5) Despite anything in this section, logging equipment must not be operated in a particular location or manner if its stability cannot be assured during that operation.

Slope limitations — known

As specified in section 26.16(2), if the manufacturer certifies in writing that the equipment is able to work up to a certain slope percentage, then the equipment can be operated up to that limit as long as the operator follows the manufacturer's instructions and any other written procedures.

Most equipment manufacturers, however, have been reluctant to provide any type of slope certification or other indication of safe operating limits. They recognize that any such values will not be absolutes because a machine's ability to remain stable in varying terrain depends on many different factors. If this is the case, it becomes the employer's and operator's responsibility to determine when and where the equipment can be operated safely, and how risks should be mitigated based on a comprehensive risk assessment specific to the site conditions.

Slope limitations — not known

Section 26.16(3) specifies restrictions for specific types of logging equipment if the manufacturer's maximum slope operating stability limits are not known. This section of the Regulation has occasionally been misinterpreted within the industry. The specified limits have at times been characterized as arbitrary and not reflective of advancements in technology that have occurred since regulatory review and amendment of this section last took place in 2008. This is perhaps because, when read in isolation, the provisions in section 26.16(3) may lead to an interpretation that the Regulation doesn't allow any use of mobile logging equipment on slopes that exceed those specified in section 26.16(3). However, section 26.16(4) goes on to specify that logging equipment may be operated beyond the maximum slope operating stability limits in some cases.

Operating beyond the slope limitations

The provisions in section 26.16(4) allow the use of equipment beyond the slope limits as long as a *qualified person conducts a risk assessment and written safe work practices acceptable to WorkSafeBC are developed and implemented to ensure the equipment's stability*. These provisions are particularly relevant because advancements in technology have led to the manufacture of equipment considered by industry and manufacturers to be capable of operating on slopes steeper than those specified in the Regulation.

Rather than prohibiting the use of newer equipment, section 26.16 provides considerable leeway for the use of equipment, as long as the employer exercises due diligence in controlling risks. Best practices call for thorough risk assessments and the development of written safe work procedures for all worksites, whether steep-slope logging is involved or not. Loss of equipment stability can occur even in terrain well below the prescribed slope limits. Staying below the limits is no guarantee that an incident won't occur, but these limits serve to highlight the potential for serious consequences and prompt the employer that a more rigorous risk assessment is required.

For more discussion of regulatory provisions that address slope limits, [see guideline G26.16](#), which is associated with section 26.16 of the Regulation.

Safe work procedures and manufacturer instructions specific to winch-assist equipment

Several additional areas of concern have been identified and may be dealt with in the manufacturer's instructions or written safe work procedures. These concerns are as follows:

- Stump selection and method of securement, as well as frequency of inspection to ensure worker safety and machine stability.
- Winch and cable inspection — how often and to what standard?
- Potential to damage or sever cable with head, boom, or logs.
- Abrasion of cable on rock outcrops and other obstacles.
- Safe work area around machine and cable. Area of no entry may be different than in regular mechanized falling.
- Rescue procedure in the event of breakdown or misadventure. How do you right a machine if it flops on its side?
- Worker training.
- Lockout and de-energization procedures.
- Winch capacity/load rating and safety systems. Failsafes?
- Cable size and strength.

Worker training

Employers must ensure that operators are adequately trained in the use of mobile logging equipment before they start work. Operators must demonstrate to a qualified supervisor that they can operate the equipment competently.

Workers Compensation Act, section 115, General duties of employers

- (2) Without limiting subsection (1), an employer must
 - (e) provide to the employer's workers the information, instruction, training and supervision necessary to ensure the health and safety of those workers in carrying out their work and to ensure the health and safety of other workers at the workplace.

Section 26.3, Training

- (1) Every worker in a forestry operation must receive the training necessary to safely perform the worker's duties.

Section 3.23, Young or new worker orientation and training

- (1) An employer must ensure that before a young or new worker begins work in a workplace, the young or new worker is given health and safety orientation and training specific to that young or new worker's workplace.

Section 16.4, Competency of operators

- (1) A person must not operate mobile equipment unless the person
 - (a) has received adequate instruction in the safe use of the equipment,
 - (b) has demonstrated to a qualified supervisor or instructor competency in operating the equipment,
 - (c) if operating equipment with air brakes, has a valid air brake certificate or a driver's license with an air brake endorsement, or evidence of successful completion of a course of instruction on air brake systems by an organization acceptable to the Board, and
 - (d) is familiar with the operating instructions for the equipment.

Cranes and hoists

Part 14 of the Regulation specifies requirements for cranes and hoists. Section 14.9 provides an exemption for specialized logging equipment from the requirements specified in sections 14.5 to 14.8. Despite this exemption, employers and suppliers should still review all of Part 14 because some sections will apply to logging equipment.

Section 14.9, Logging exemption

Specialized equipment designed and used only for logging operations is exempt from the requirements of sections 14.5 to 14.8.

Rigging

Part 15 of the Regulation specifies requirements for rigging. Employers should review Part 15 and ensure that they are complying with all the necessary requirements. Pay special attention to the sections on inspection and rejection criteria.

Section 3.5 of the Regulation applies to cable inspection.

Section 3.5, General requirement (Workplace inspections)

Every employer must ensure that regular inspections are made of all workplaces, including buildings, structures, grounds, excavations, tools, equipment, machinery and work methods and practices, at intervals that will prevent the development of unsafe working conditions.

Planning a forestry operation

Planning a forestry operation includes considering what types of mobile equipment will be necessary and how they will be used. The site layout, slopes, and other environmental conditions are factors that will determine whether or not a piece of equipment will be appropriate for the work.

Section 26.2, Planning and conducting a forestry operation

- (1) The owner of a forestry operation must ensure that all activities of the forestry operation are both planned and conducted in a manner consistent with this Regulation and with safe work practices acceptable to the Board.
- (2) Every person who has knowledge and control of any particular activity in a forestry operation must ensure that the activity is both planned and conducted in a manner consistent with this Regulation and with safe work practices acceptable to the Board.
- (3) The planning required under this section must
 - (a) include identification of any work activities or conditions at the workplace where there is a known or reasonably foreseeable risk to workers,
 - (b) be completed before work commences on the relevant activity, and
 - (c) be documented at the time of planning.

Radio controlled equipment

If a piece of mobile equipment is operated by remote control, the remote control device must have a fail-safe or stop mechanism in case the device fails.

Section 26.12.2, Radio controlled equipment

In a forestry operation, any equipment that is controlled by a remote control device must be equipped with a “fail safe” or “stop” mechanism that becomes operational if the remote control device fails.

Standards and guidelines

WCB Standards

The standards that apply to mobile equipment used in logging operations include the following:

- G602, Log loader and log yarder raised cabs
- G603, Log loader and log yarder window guards
- G604, Light-duty screen guards for off-highway equipment
- G608, Mobile equipment roof structures — heavy duty

You can access these standards online in one of the following ways:

- Go to worksafebc.com and search for “WCB standards”.
- Go directly to worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/wcb-standards/wcb-standards.

Note

For some equipment, the standards that apply will depend on how the equipment is being used.

Guideline G16.21(2)-2

Guideline G16.21(2)-2, Protective Structures — Acceptable Alternate Standards, describes acceptable alternatives to the WorkSafeBC G600 series of standards for protective structures on mobile equipment.

You can access this guideline online in one of the following ways:

- Go to worksafebc.com and search for “guideline 16.21”, and then when you’re in the guideline scroll down until you get to subsection (2)-2.
- Go directly to worksafebc.com/en/law-policy/occupational-health-safety/searchable-ohs-regulation/ohs-guidelines/guidelines-part-16#SectionNumber:G16.21_2-2.

