DE-ENERGIZATION AND LOCKOUT

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G10.3 Worker entry into J-bar sorting systems in sawmills

Issued August 1999; Editorial Revision June 30, 2021

Regulatory excerpt
Section 10.3(1) of the *OHS Regulation* ("*Regulation*") states:

> If machinery or equipment is shut down for maintenance, no work may be done until
>
> (a) all parts and attachments have been secured against inadvertent movement,
>
> (b) where the work will expose workers to energy sources, the hazard has been effectively controlled, and
>
> (c) the energy isolating devices have been locked out as required by this Part.

Purpose of guideline
The purpose of this guideline is to outline that a J-bar sorting system must be locked out, in accordance with Part 10 of the *Regulation*, before anyone enters into the bin areas, either above or below the lifts.

Securing the lifts
Sections 10.3(1)(a) and 12.15(b) of the *Regulation* require actions to be taken to ensure the lifts will not move when a worker is present in the bin area. WorkSafeBC recognizes either of the following means of securing the lifts against inadvertent movement:

a) Lowering the lifts onto positive mechanical stops of adequate size, or onto the bin removal chains. (Safety stops cannot be depended on to withstand the impact of a falling lift, for example, from hydraulic or mechanical failure in suspension system.)

b) Another means of restraint when circumstances require entry of a worker into a bin to clear a lumber hang-up which prevents lowering of the lift onto a positive stop.

Blocking and restraining devices must be:

a) Capable of performing the functions for which they are to be used, which may be shown by documentation from the equipment manufacturer (sections 4.3 and 4.8 of the *Regulation* apply), and

b) Maintained as specified by the manufacturer (section 4.3 applies).

Guarding of the bin removal chain drives is not be required as this is a restricted access area and the system must be locked out before entry is permitted.

G10.4(1) Lockout of multiple control devices

Effective August 1999; Editorial Revision June 30, 2021

Regulatory excerpt
Section 10.4(1) of the *OHS Regulation* ("*Regulation*") states:

> When lockout of energy isolating devices is required, the devices must be secured in the safe position using locks in accordance with procedures that are made available to all workers who are required to work on the machinery or equipment.

Purpose of guideline
The purpose of this guideline is to provide guidance around the lockout of multiple control devices as required by section 10.4(1) of the *Regulation*.

Multiple control devices
In some lockout situations, several energy isolating devices located near each other, such as in a motor control center, need to be locked out. One alternative is to use a personal lock to secure each isolating device in the off or safe position. WorkSafeBC will also accept the running of a cable, bar, or chain through the lock points of the devices (once they are in the off or safe position) and securing the cable, bar, or chain against removal with a personal lock if the following criteria are met:

- The control devices are effectively secured in the off or safe position. (The strength, diameter, and routing of the cable, chain, or bar are

sufficient to prevent the control devices being activated.)
- The locking mechanism is secure. (The construction and strength of fittings are sufficient to prevent the removal of a personal lock without the use of tools and destruction of the lock or fitting to which the personal lock is affixed.)
- The multiple lockout system addresses all aspects of lockout requirements. Items such as the use of group lockout procedures, and the use of a personal lock simultaneously with multiple control device lockout schemes is clearly established in the written procedures.
- Training and supervision is provided.

There is no limit on the length of cable, bar, or chain acceptable or the maximum number of control devices that may be secured at one time as long as the system ensures equivalent protection to the use of personal locks on each energy isolating device.

G10.4(6) Use of means other than personal locks

Effective August 1999; Revised April 30, 2015; Revised November 29, 2021

Regulatory excerpt
Section 10.4(6) of the *OHS Regulation* ("*Regulation*") states:

> If the use of a personal lock is not practicable for lockout, another effective means, if approved by the Board, may be used in place of a personal lock to secure an energy isolating device in the safe position.

Purpose of guideline
There are some situations where use of a personal lock will not be practicable. The purpose of this guideline is to identify those alternate effective means that have been approved by WorkSafeBC.

School breaker panel
One example of such a situation would be a school with a circuit breaker panel in a hallway used by students. The panel cover is normally locked, and the maintenance and other personnel who are authorized to access the panel have a key. When maintenance requires a circuit to be locked out, an approach used in the past was to fix a lockable arrangement on the outside of the panel door to allow the worker to switch off the circuit and then lock the panel door shut with a personal lock. This prevented others from accessing other breakers in the panel, but is now prohibited by section 10.5 of the *Regulation*.

There are devices that can be installed on individual circuit breakers to allow the breaker to be locked out with a personal lock. However, in some cases the personal lock may not allow the panel door to be closed and secured with the panel door lock. This allows unauthorized access to the breakers by students or others. An alternate device acceptable for use in these types of situations would be a "non-reusable seal" that is installed with adequate identification to show who put it on and that it is installed for lockout purposes. All persons with access to the panel must be trained to know the seal is part of a lockout procedure, and is not to be removed by anyone other than the person who installed it. The employer must limit the use of this alternative to situations where a personal lock cannot reasonably be used.

Secure blocking, pinning, plugging, or other industry specific methods
Another area where the use of a personal lock to secure an energy isolating device may not be practicable is when blocking, pinning, plugging, or other devices are used to control sources of hazardous energy typically in pipelines. The lockout procedure must be clear on how such devices are to be installed and secured in place. All workers must know such devices are part of a lockout procedure and are not to be removed except with the permission of all the persons involved in the lockout. A risk assessment identifying potential hazards and failure modes should be conducted before using these systems.

Cryogenic supply system
A cryogenic supply system meeting the specifications in clause 7.4 and Annex K of *CSA Standard Z460-13 — Control of hazardous energy — Lockout and other methods*, is approved for cases where freezing of the pipe contents to form a plug in the pipe (freeze plug) is used to block piping and isolate equipment. The cryogenic supply system must be monitored at all times to ensure that the integrity of the freeze plug is maintained and the plug has not melted or loosened within the piping. The cryogenic supply system which will be used to freeze the pipe contents to effectively control the energy source should be identified in the pertinent lockout procedure. Lockout or tagout should be done on the cryogenic supply system to prevent an inadvertent shutdown of the freezing supply system, and workers need to place personal tags at the freeze points to indicate their presence and to prohibit the cessation of the freeze.

Plug systems
Piggable pipeline pressure isolating tools that are designated to self-lock in their set position are an acceptable alternative means to secure sources of hazardous energy. These tools are typically used to provide isolation of a work location from pipeline operating pressure for activities such as repair and maintenance. A permit to work must be issued only after it has been determined that the tool is set, and the seal must be monitored for an established duration to verify that the tool is sealing and set. An area isolation assurance certificate must be generated for each plugging operation before a Permit to Work is issued. Measures must be taken to prevent inadvertent un-setting or unsealing of the tool from the tool's computer control system and/or from the operator's console.

Failure of the seal must trigger an audio and visual alarm at the work area and at the operator control.

G10.10(2) Approval of control system isolating devices

Issued August 1999; Editorial Revision October 2004; Editorial Revision February 6, 2006; Revised April 27, 2010; Editorial Revision June 30,

2021

Regulatory excerpt
Section 10.10(2) of the *OHS Regulation* (*"Regulation"*) states:

> Control system isolating devices and the procedures for using them must be approved in writing by the Board, and must be used by workers qualified and authorized to carry out the work.

Section 10.1 of the *Regulation* states, in part:

> "*control system isolating device*" means a device that physically prevents activation of a system used for controlling the operation of machinery or equipment.

Purpose of the guideline
This guideline describes "control system isolating devices" and describes the approval process for these devices and the procedures for using them.

What is a control system isolating device?
Regulation section 10.1 defines a control system isolating device (CSID) as a device that physically prevents activation of a system used for controlling the operation of machinery or equipment. The *system* in this definition means the control system used for controlling the operation of machinery and/or equipment where work is being undertaken.

As per the definition, a CSID operates *physically* to a mode or position to override or disable the control system so that it prevents risk of injury to workers from the movement of the machinery and/or equipment, or exposure to an energy source.

A switch as a control system isolating device
A switch can be an acceptable CSID if it is rated in the amperage and voltage of the circuit in which it is installed, and is capable of interrupting its rated current at the rated voltage.

The switch is required to be used as per the manufacturer's specification and instruction (e.g., a switch that is rated only for a dry environment cannot be installed in a wet environment; switches used in a hazardous environment need to bear the appropriate approval markings).

Note that *Regulation* section 10.10(1)(c) specifies that, for machinery or equipment designed and equipped with effective control system isolating devices, the devices must be locked out before work is done on the machinery or equipment.

An electronic switch (e.g., light curtain, photo eye, or software logic generated output) is not considered to meet the requirements for a CSID since it does not *physically* prevent activation. *IEEE Standard 100 defines a 'physical system' as a part of the real physical world that is directly or indirectly observed or employed.*

A dual-channel safety interlock switch as a control system isolating device
A dual-channel safety interlock switch (SIS) that is (i) safety rated (as defined in *CSA Z460-05 Control of Hazardous Energy -- Lockout and other methods**), (ii) has a direct opening action, and that (iii) is used in the positive mode of operation can be an acceptable CSID.

**CSA Z460-05* states that safety-rated switches are tamper-resistant and mechanically actuated devices with positively driven multiple contacts. Magnetic switches can be safety rated if they are coded and have monitored contacts.

To be acceptable, the SIS needs to be installed as part of a control system that uses safety certified control components meeting design architecture of *ISO 13849-1 Safety of Machinery* category 3 or 4. These are called *control reliable* control systems and are described in *CSA Z432-04 Safeguarding of Machinery*.

The safety related parts of the control system (defined in *ISO 13849: 2006 Safety of Machinery*, referenced in OHS Guideline G19.36(1)) need to provide acceptable risk-reduction for the task that is being performed under its protection. A SIS installed as above is excluded from fault of non-opening of the contact and/or non-actuation of the switch due to mechanical failure.

How to request written approval
A request under section 10.10(2) of the *Regulation* for approval to use a CSID as an isolation device (i.e., to use control circuit lock-out) is considered an acceptance request and should follow the process described on the Variances and Acceptances webpage.

The applicant should conduct a risk assessment and the submission should include the following information:

1. A list of the tasks or activities intended to be done using CSID's.
2. A description of the hazard(s) which workers will be protected from by using the CSID and procedures.
3. How the hazards are controlled by installing the control system (or the control system supplied from the manufacturer).
4. An explanation of why it is not practicable to implement lockout through use of energy isolating devices rather than CSID's.
5. A description of the proposed control circuit system that will be isolated using the CSID. A schematic diagram of the control circuit system.
6. The procedures for using the CSID. The procedures should describe in detail (step-by-step) how to perform each task safely while using a

CSID (i.e., provide information on how a particular task will be performed using CSID's, not simply how to operate the equipment or machine using the control system). There should also be a procedure for what action the operator and/or worker is to undertake in case of failure of the control system.

7. How the control system limits the machine (e.g., when the gate is open the cutter runs at a lower speed).

8. If SIS's are used as a CSID, provide documentation to show that the safety related parts of the control system use safety certified components and the design architecture meets Category 3 or higher.

After conducting a review of the application, the Prevention Practice, Quality, and Engineering department will issue a decision letter with respect to approval of the CSID and the associated procedures.

G10.11 Locks not required

Effective August 1999; Revised March 7, 2011

Regulatory excerpt
Section 10.11(a) of the *OHS Regulation* ("*Regulation*") states:

> The application of a lock is not required under section 10.3 or 10.10 if
>
> (a) the energy isolating device is under the exclusive and immediate control of the worker at all times while working on the machinery or equipment, or ...

Purpose of guideline
The purpose of this guideline is to explain the conditions under which work may be performed on machinery or equipment, using means other than the application of a lock to control various energy sources.

Locks not required
This provision applies only if the energy isolating device is under the exclusive and immediate control of the worker, and it is not reasonably foreseeable that that the machine or equipment could be started inadvertently by the worker performing the work, or by any other worker. It is intended to allow for tool changes on equipment such as a drill press or lathe without requiring lockout through the use of a personal lock.

Given the variation in the types of energy isolating devices that are installed on equipment and machinery, employers need to assess these devices to ensure that they cannot be readily activated in the case of inadvertent movement, such as a worker leaning on or brushing against the energy isolating device. In cases where these energy isolating devices are susceptible to inadvertent activation, this section does not apply. The work must be done as prescribed in accordance with lockout procedures set out in sections 10.3 and 10.4 of the *Regulation*.

WorkSafeBC will accept that a worker has exclusive and immediate control of the energy isolating device if all of the following criteria have been met:

- The machine or equipment has only one set of operating controls, the equipment is stopped, and all potential sources of energy are reduced to a zero energy state.
- The energy isolating device remains in the field of vision of the worker at all times while the task is being done and is located so any move by another worker to activate the control will be immediately obvious to the worker doing work on the machine or equipment.
- Written safe work procedures exist for the task, and the affected workers are trained in and follow those procedures.
- The written safe work procedures are specific as to what tasks can be done without the application of a personal lock. Any other maintenance or servicing activities must be done as prescribed by sections 10.3 and 10.4 of the *Regulation*.