



Mining webinar: Conveyor Guarding in Mines and Mining Plants

1.888.730.7821 (Toll free Ontario)
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Welcome to the webinar: Be prepared for MOL inspection blitz on Conveyor Guarding in Mines and Mining Plants

- The webinar will begin at **10:00 am Eastern Time**
- For audio, please use headphones or ear buds.
- Please note the '**CHAT BOX**' to the right of the screen and feel free to type in your questions at any time during the presentation.
- Questions may be answered during the presentation, but most will be addressed at the end of the presentation.
- For your reference, this presentation will be emailed to attendees within one business day of the webinar.
- For assistance with the webinar, phone the WSN office at:
1-888-730-7821 ext. 0

Webinar co-hosts

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Agenda

- Introduction and injury statistics
- Pertinent legislation
- Conveyor operation hazards and controls
- WSN information and resources
- What Ministry of Labour (MOL) Mining Health and Safety Inspectors will be looking for during the conveyor guarding blitz
- Ontario requirements pertaining to conveyor guarding in the workplace in mines and mining plants (Occupational Health and Safety Act, Regulation 854)
- Q & A

MOL Blitz Overview

The purpose of the inspection blitz:

- Raise the awareness of employers, supervisors and workers about conveyors to better understand the risks associated with exposures to unguarded pinch points and moving parts while conveyors are operating to reduce or eliminate the hazard.
- Raise awareness of the amendments made to sections 196 and 196.1 of Regulation 854 to improve safety around belt conveyor systems.
- Promote awareness of worker safety around unguarded conveyors when performing work while conveyor is operating.
- Ensure the workplace parties are complying with the OHSA and its regulations.

Workplace Health and Safety Snapshot for Ontario Mining Sector in 2017



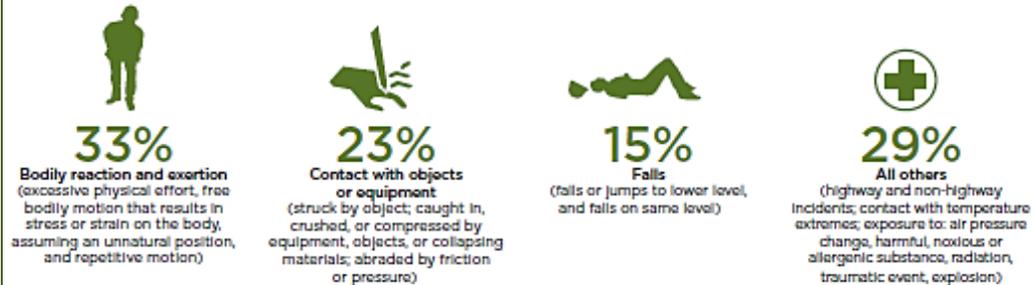
21,494

Full-time employees

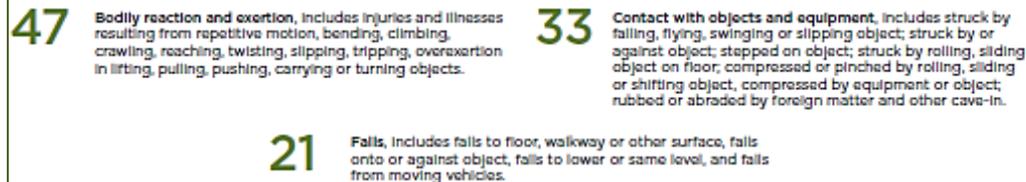


Events resulting in lost-time injury or illness

Injury or illness severe enough to require one or more days lost from work

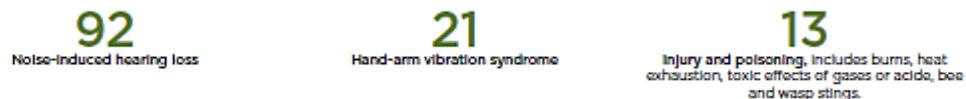


Most common lost-time injuries



Top 3 Occupational Diseases

Based on approved WSIB claims for healthcare, being off work, loss of wages, or permanent disability



*Disease fatality claims approved by WSIB in 2017. Source: WSIB Enterprise Information Warehouse as of February, 2018, RG 70, 71, 119 WSN March 2018.

NOTE: 2017 data is not mature.



For more detailed statistics and trends
workplacesafetynorth.ca/resources/mining-statistics

Pertinent Legislation

OHSA

Section 25 (2) An employer shall,

(h) take every precaution reasonable in the circumstances for the protection of a worker;

Regulation 854 (Mines and Mining Plants)

Section 196. (1) - Riding on conveyor coming

Section 196. (2) - Conveyor safety

Section 196. (3) - Guarding conveyor pinch points and moving parts

Section 196. (4) - Guarding underpass

Section 196. (5) - Guarding against excessive drive pulley slip

Section 196. (6) - Conveyor locking and tagging

Pertinent Legislation (continued)

Regulation 854 (Mines and Mining Plants continued...)

Section 196.1 (1), (2), and (3) - Conveyor emergency stopping system

Section 196.1 (4) - Other means to prevent worker access to pinch points (i.e. fences, barricades and gates equipped with interlocking devices)

Section 185 - Guarding of other moving equipment parts associated with belt conveyor system ((i.e. crushers, feeders, screens); and lock and tag requirements

Section 262 - Effective illumination

Pertinent Legislation (continued)

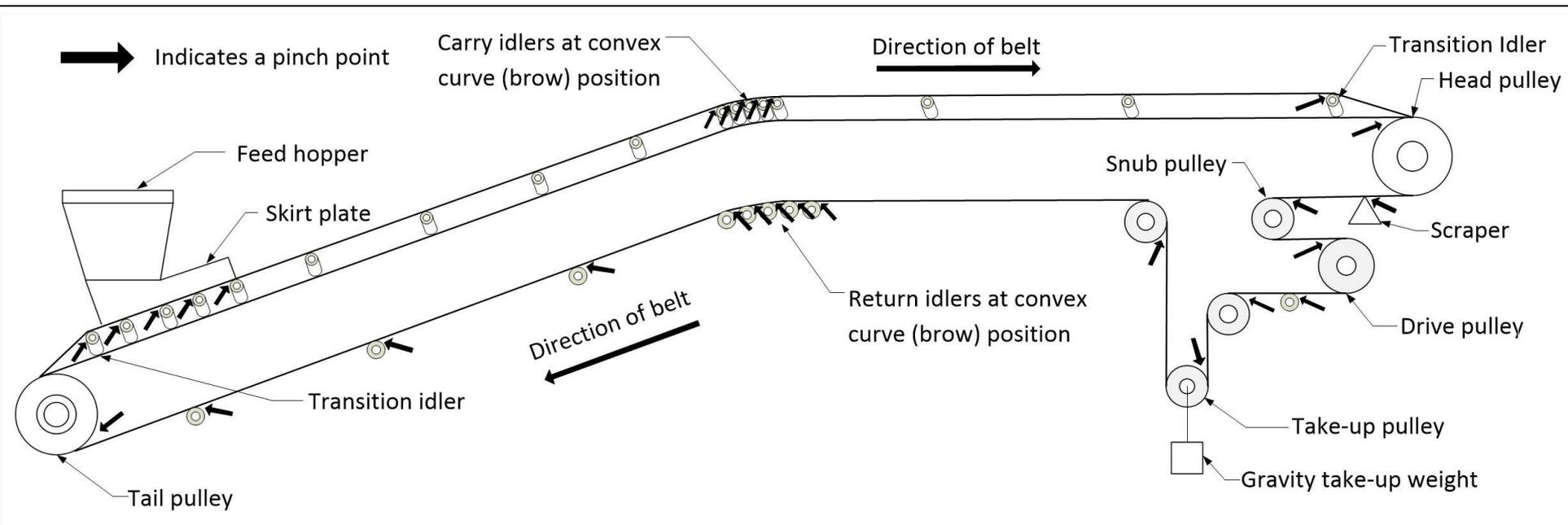
Regulation 854 (Mines and Mining Plants continued...)

Section 5.1 (1) - Risk assessment and risk register, with the involvement of the JHSC

Section 5.2 - Controls

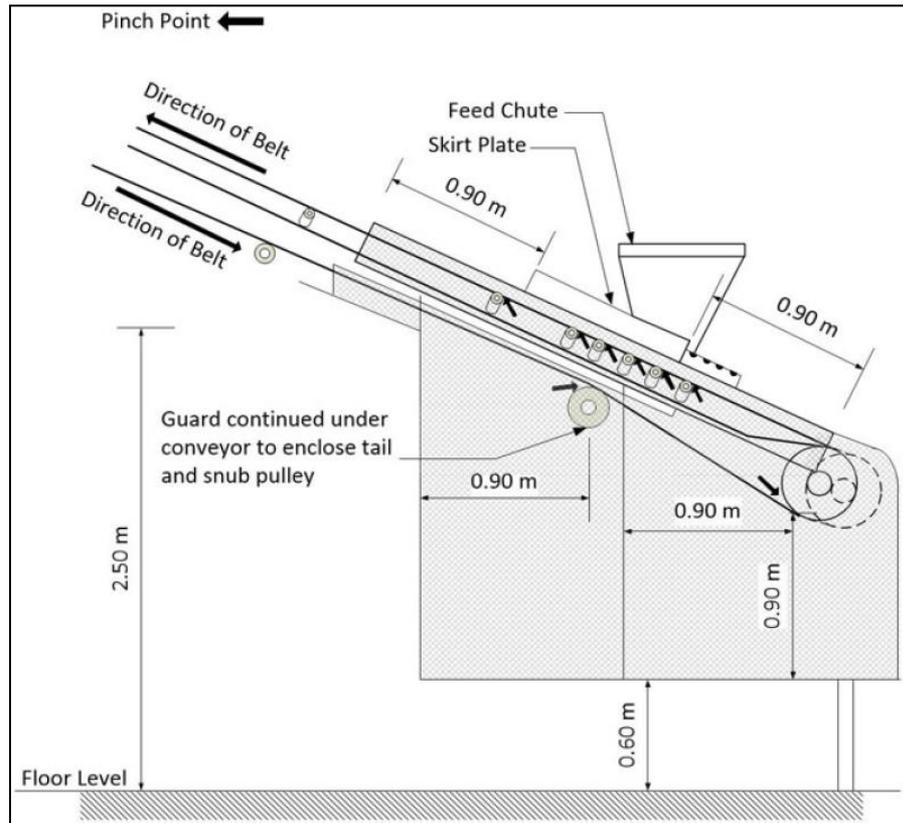
Section 5.3 - Risk Assessment updated yearly at minimum; for existing hazards or potential hazards that have changed

Typical conveyor mechanical hazards

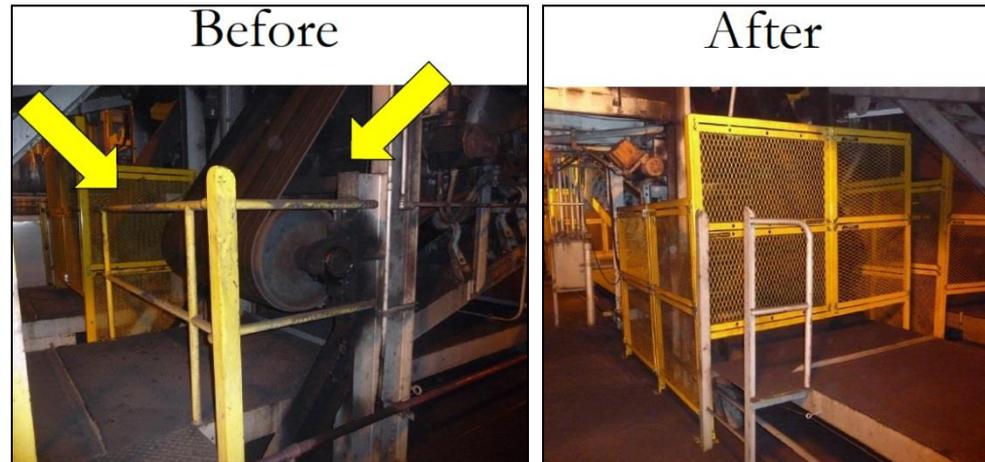


Belt conveyor diagram (source: MOL Conveyor Guarding Guideline).

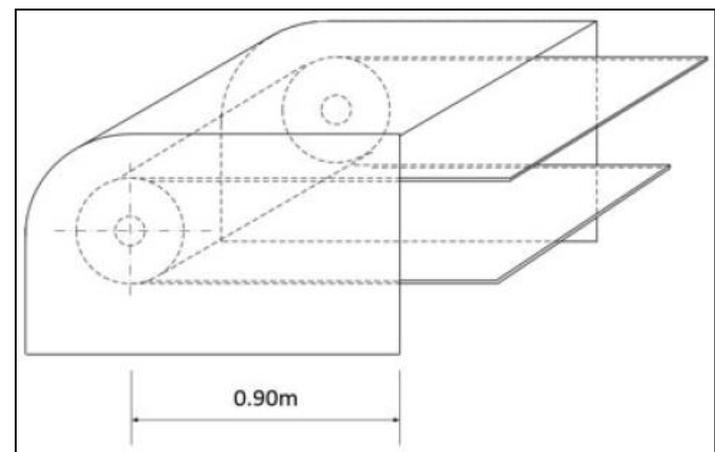
Guarding examples - vicinity of pulleys



Example guarding in the vicinity of a tail pulley (source: MOL Conveyor Guarding Guideline).

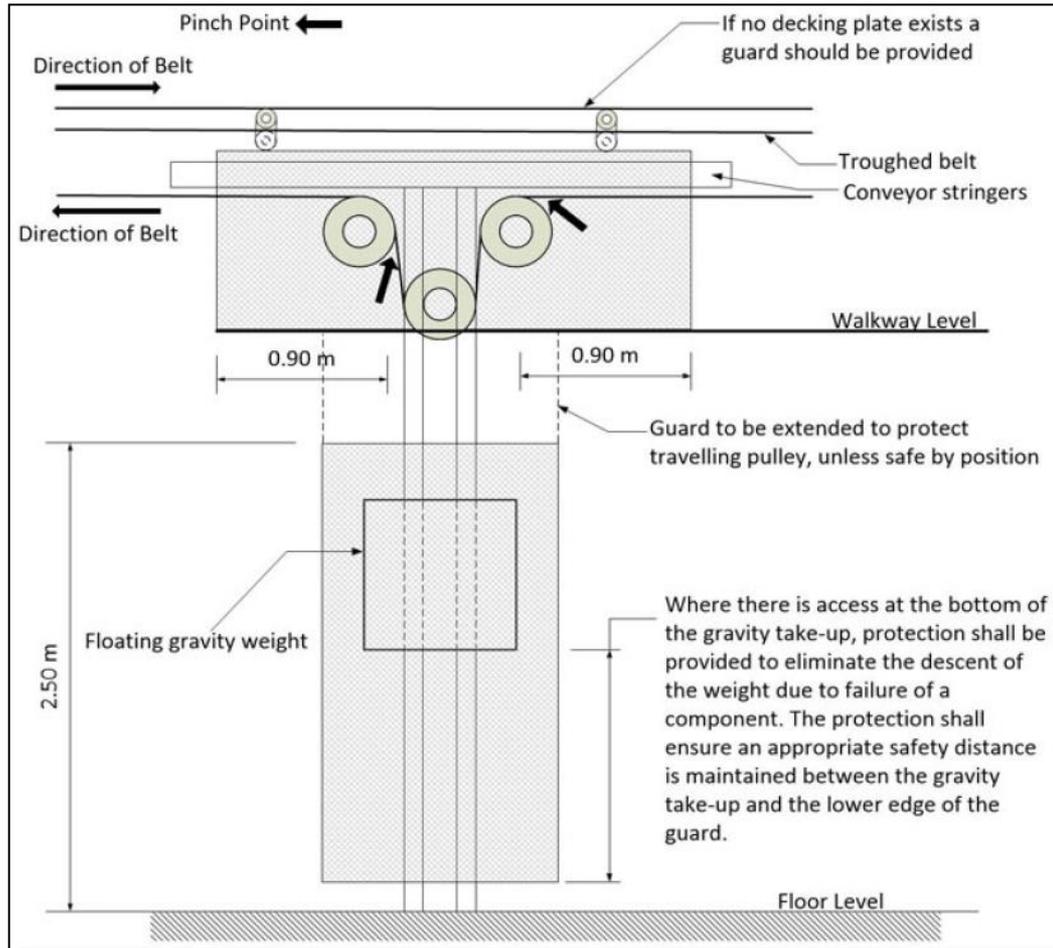


(source: Belt Conveyor Guarding)



(source: MOL Conveyor Guarding Guideline)

Guarding examples - vicinity of take-ups and counterweights



Example guarding in the vicinity of take-ups and counterweights (source: MOL Conveyor Guarding Guideline).

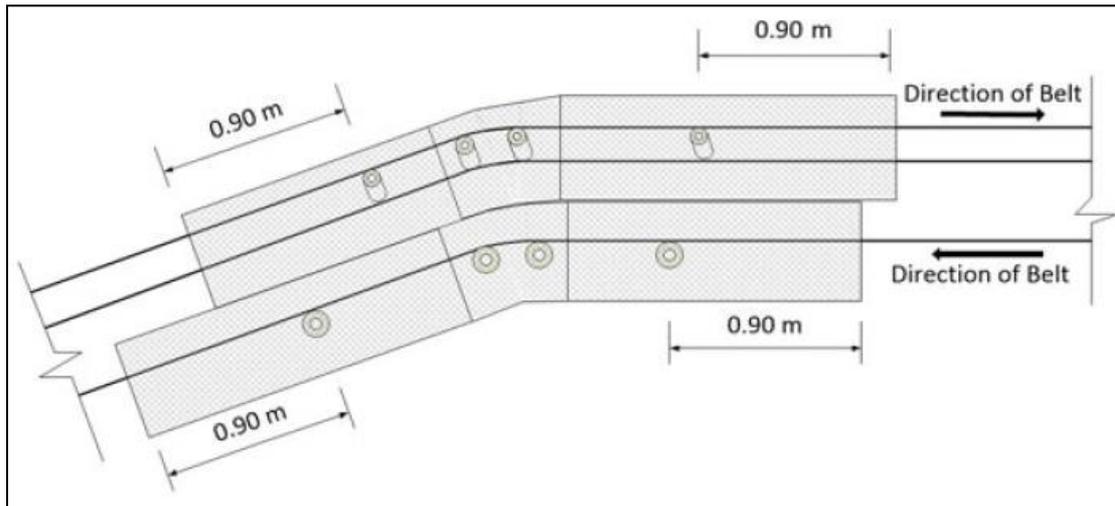


Single conveyor gravity take-up counterweight guarding (source: Belt Conveyor Guarding)



Two conveyor gravity take-up counterweight guarding (source: Belt Conveyor Guarding)

Guarding examples - vicinity of carry and return idlers when belt lift is restricted



Example guarding in the vicinity of carry and return idlers when belt lift is restricted (source: MOL Conveyor Guarding Guideline).



Example of well guarded belt conveyor pinch points and rotating parts; movable guards are equipped with wedge clamps.



Example of a totally guarded conveyor.

Guarding examples - vicinity of hoppers, chutes, loading, unloading and discharge points

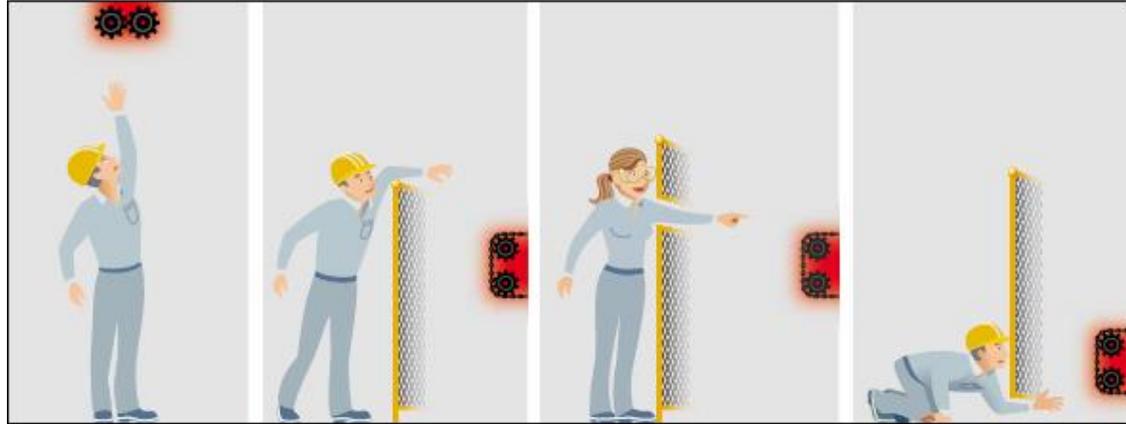


Example guarding in the vicinity of a hopper
(source: Belt Conveyor Guarding).



Example of guarding vicinity of a transfer chutes.

Guarding examples guard by location, overhead protection and other means to prevent worker access to pinch points or moving parts



Guarding example for different situations in which the distance protection principle applies (source: Fixed guards and safety distances safety GUIDE RG-597, CSST, IRSST).

Source: 2014 Health and Safety Conference.

Guarding examples – machine guarding



Example guarding in the vicinity of a grinding mill
(source: Belt Conveyor Guarding).



Example of guarding the flywheel of a crusher.
(source: Belt Conveyor Guarding).

Information and Resources

- **Ministry of Labour (MOL) - Conveyor Guarding**
https://www.labour.gov.on.ca/english/hs/pubs/gl_conveyor.php
Free download

- **Canadian Standards Association (CSA):**
CSA Z432-16 - Safeguarding of machinery
Revised April 2017

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Ontario
MINISTRY OF LABOUR

Conveyor Guarding

Issued: May 15, 2017
Content last reviewed: May 2017
See also: Mines

Purpose
The purpose of this document is to help workplace parties understand the requirements for conveyors (including guarding and emergency stopping systems) in the Regulation for Mines and Mining Plants (Regulation 694) under the Occupational Health and Safety Act (OHSA). Current best practices for conveyor guarding are also provided.

Objectives

- to provide guidance to assist in complying with legal requirements for guarding of conveyors, including preventing worker access to pinch points that are or may become accessible
- to provide information on current best practices for engineering and design to provide optimum safety for workers

Legal requirements
Sections 100 and 106.1 of the Mining Regulation set out the key requirements for conveyors.

Background information

- Conveyors are widely used in Ontario mines. Workers may be exposed to certain hazards if conveyor belts and related equipment are not properly guarded and maintained.
- Ontario workers have been killed and injured when they came into contact with equipment or components, such as conveyor drive belts and improperly guarded pinch points.
- This guideline supports other safety practices and procedures in the workplace, such as locking and tagging procedures when repairs, adjustments or other maintenance work is performed on conveyors [Mining Reg. s. 106.0(2)].

Requirements and best practices

Conveyor guards
As a general matter, accessible pinch points must be guarded at the head, tail, drive and deflection pulleys or if the lift of the belt is restricted, the return rollers and carry rollers [Mining Reg. s. 106.1(3)]. An accessible pinch point is a place where it is possible for a body part, article of clothing or an object to be caught between moving machine parts or between moving and stationary machine parts.

Figure 1. Best conveyor pinch points (Diagram is illustrative only and not to scale)

[View a larger version of the illustration](#)

https://www.labour.gov.on.ca/english/hs/pubs/gl_conveyor.php 5/2/2018

7432-16

CSA Group

Safeguarding of machinery

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Information and Resources

- **Work Safe BC - Safeguarding Machinery and Equipment**

<https://www.worksafebc.com/en/health-safety/tools-machinery-equipment/safeguarding>

Free download

- **Belt Conveyor Guarding - Guarding Equipment**

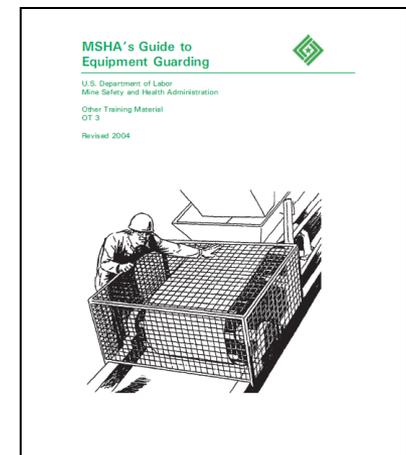
<https://www.workplacesafetynorth.ca/resources/guarding-equipment-belt-conveyor-guarding>

Free download – 2017 Mining Health and Safety Conference PowerPoint presentation

- **MSHA's Guide to Equipment Guarding**

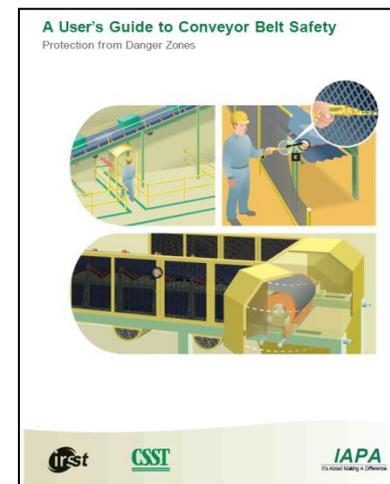
<https://arlweb.msha.gov/s&hinfo/equipguarding2004.pdf>

Free download



Information and Resources

- **WorkSafe NB - Conveyor Safety**
New Brunswick 2014 Annual Health and Safety Conference PowerPoint presentation – available upon request
- **IRSST and CSST: A User's Guide to Conveyor Belt Safety**
Protection from Danger Zones
- **IRSST and CSST: Machine Safety**
Prevention of mechanical hazards



Conveyor Guarding in Mines and Mining Plants

June/July 2018

***Workplace Safety North Webinar
May 10th, 2016***

Why is the MOL Doing a Conveyor Guarding Blitz?

- ❑ Between 2012 and 2017, there have been 7 critical injuries, 2 non critical, and 1 fatality related to workers exposed to unguarded running conveyors.
- ❑ Follow up to amendments made in July of 2016 to sections 196 and 196.1 of regulation 854 to improve worker safety around conveyors.
- ❑ To raise the awareness of employers, supervisors and workers about conveyors so that they better understand the risks associated with exposures to unguarded pinch points and running conveyors to reduce or eliminate the hazard

IMPORTANT NOTE RE: Conveyor Guarding

- ❑ For guidance purposes, this presentation references specific sections of Regulation 854 (Mines and Mining Plants) under the Occupational Health and Safety Act (OHSA) to highlight some key focus areas of Ministry of Labour (MOL) inspectors' activities during this Blitz. It is the employer's responsibility to be aware of all relevant requirements that are set out under the OHSA and its regulations.
- ❑ Inspectors will take enforcement action, as appropriate, if they find violations of the OHSA and any of its regulations.
- ❑ Partnering with Workplace Safety North on delivering compliance support to the sector in advance of the enforcement blitz.

Blitz focus: Conveyor Guarding Mines and Mining Plants

Regulation 854

196. (1) No person shall ride on a conveyor belt.

(2) A conveyor shall have,

(a) a means to safely apply belt dressing while the conveyor is in motion;
and

(b) if the conveyor is started automatically, by remote control or if a portion or portions of the conveyor are not visible from the operator's position, a start-up warning device.

Blitz focus: Conveyor Guarding Mines and Mining Plants

Regulation 854

196. (3) Subsections (3.1) and (3.2) apply to the following pinch points on a conveyor:

1. The head, tail, drive, deflection and tension pulleys.
2. If the lift of the belt is restricted, the return rollers and the carry rollers.

(3.1) Subject to subsection (3.2), the pinch points referred to in subsection (3) shall be guarded by a guard that, unless it would render the pinch point inaccessible, extends at least 0.9 metres from the pinch point.

Blitz focus: Conveyor Guarding Mines and Mining Plants

Regulation 854

- 196.** (3.2) If it is impracticable to comply with subsection (3.1),
- (a) a fence shall be in place that prevents access to the pinch points;
 - (b) a barricade shall be in place that prevents access to the pinch points; or
 - (c) a gate equipped with an interlocking device, which has a manual reset switch, shall be in place that prevents access to the pinch points while the conveyor is operating.

(3.3) Subsections (3.1) and (3.2) do not apply if the position or construction of the conveyor provides equivalent protection that renders the pinch points inaccessible.

Blitz focus: Conveyor Guarding Mines and Mining Plants

Regulation 854

- 196.** (4) Guards shall be provided beneath a conveyor,
- (a) that passes over a worker; or
 - (b) from which falling materials or parts may endanger a worker.
- (5) A conveyor in an underground mine shall have,
- (a) devices that guard against excessive slip between the belt and the driving pulley; and
 - (b) a fire suppression system at the driven end unless fire retardant belting is used or the conveyor is continually attended by a worker.

Blitz focus: Conveyor Guarding Mines and Mining Plants

Regulation 854

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

- (a) it is necessary to run the conveyor during such work; and
- (b) effective precautions are taken to prevent injury to a worker from moving parts.

Blitz focus: Conveyor Guarding Mines and Mining Plants

Regulation 854

196.1 (1) Every conveyor shall have an emergency stopping system that operates a manual reset switch that stops the conveyor.

(2) If a conveyor is accessible to a worker, the emergency stopping system is required,

(a) at any pinch point on the conveyor that is not set out in subsection 196 (3) and the emergency stopping system must be within easy reach of a worker at each of those pinch points; and

(b) at any other locations along the conveyor in order to ensure that the system is always within easy reach of a worker.

Blitz focus: Conveyor Guarding Mines and Mining Plants

Regulation 854

196.1 (3) If a conveyor is inaccessible to a worker by any means listed in subsection (4), the emergency stopping system is required at a location or locations determined by the employer following consultation with the joint health and safety committee or health and safety representative, if any.

(4) For the purposes of subsection (3), the following are considered means by which a conveyor is inaccessible:

1. A fence.
2. A barricade.
3. A gate equipped with an interlocking device, which has a manual reset switch that renders the conveyor inoperative when the gate is moved or opened.
4. The location of the conveyor renders it inaccessible.
5. Any combination of paragraphs 1 to 4.

Blitz focus: Conveyor Guarding Mines and Mining Plants

Regulation 854

185. (1) In this section,
“machine” includes a prime mover, transmission equipment and thing.

(2) A machine that has an exposed moving part that may endanger the safety of any person shall be fenced or guarded unless its position, construction or attachment provides equivalent protection.

Blitz focus: Conveyor Guarding Mines and Mining Plants

Regulation 854

5.1 (1) An employer shall conduct a risk assessment of the workplace for the purpose of identifying, assessing and managing hazards, and potential hazards, that may expose a worker to injury or illness.

(2) A risk assessment must take into consideration the nature of the workplace, the type of work, the conditions of work at that workplace and the conditions of work common at similar workplaces.

Blitz focus: Conveyor Guarding Mines and Mining Plants

Additional Duties for Employers, Supervisors and Workers

- ❑ Sections 25, 26, 27, 28 of the OHS Act set out the general duties of all employers, supervisors, and workers, including those related to measures and procedures prescribed are carried out in the workplace

Questions???

Disclaimer:

This material has been prepared to assist the workplace parties in understanding their obligations under the OHS Act and the regulations. It is not intended to replace the OHS Act or the regulations and reference should always be made to the official version of the legislation.

While this material may also be available to Ministry of Labour inspectors, they will apply and enforce the OHS Act and its regulations based on the facts as they may find them in the workplace. This material does not affect their enforcement discretion in any way.

Thank you

Thank you for attending today and helping make workplaces safer.

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