Mining webinar: Conveyor Guarding in Mines and Mining Plants
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
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

1 Injury-related fatalities
8 Disease-related fatalities
895 Total injuries
142 Lost-time injuries
4.16 Total injury rate per 100 workers
+3.74% Change in injury rate from previous year

Events resulting in lost-time injury or illness
Injury or illness severe enough to require one or more days lost from work

- 33% Bodily reaction and exertion (excessive physical effort, free bodily motion that results in stress or strain on the body, assuming an unnatural position, and repetitive motion)
- 23% Contact with objects or equipment (struck by object, caught in, crushed, or compressed by equipment, objects, or collapsing materials; abraded by friction or pressure)
- 15% Falls (falls or jumps to lower level, and falls on same level)
- 29% All others (highway and non-highway incidents; contact with temperature extremes; exposure to: air pressure change, harmful, noxious or allergic substance, radiation, traumatic event, explosion)

Most common lost-time injuries

- 47 Bodily reaction and exertion, includes injuries and illnesses resulting from repetitive motion, bending, climbing, crawling, reaching, twisting, slipping, tripping, overextension in lifting, pulling, pushing, carrying or turning objects.
- 33 Contact with objects and equipment, includes struck by falling, flying, swinging or slipping object; struck by or against object; stepped on object; struck by rolling, sliding object on floor, compressed or pinched by rolling, sliding or shifting object, compressed by equipment or object; rubbed or abraded by foreign matter and other cave-in.
- 21 Falls, includes falls to floor, walkway or other surface, falls onto or against object, falls to lower or same level, and falls from moving vehicles.

Top 3 Occupational Diseases
Based on approved WSIB claims for healthcare, being off work, loss of wages, or permanent disability

- 92 Noise-induced hearing loss
- 21 Hand-arm vibration syndrome
- 13 Injury and poisoning, includes burns, heat exhaustion, toxic effects of gases or acids, bee and wasp stings


NOTE: 2017 data is not mature.
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
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
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).
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).

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
  Free download

• Canadian Standards Association (CSA):
  CSA Z432-16 - Safeguarding of machinery
  Revised April 2017
Information and Resources

• **Work Safe BC - Safeguarding Machinery and Equipment**
  
  
  Free download

• **Belt Conveyor Guarding - Guarding Equipment**
  
  [https://www.workplacesafetynorth.ca/resources/guarding-equipment-belt-conveyor-guarding](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**
  
  
  Free download
• **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.

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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.

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Blitz focus: Conveyor Guarding Mines and Mining Plants

Additional Duties for Employers, Supervisors and Workers

- Sections 25, 26, 27, 28 of the OHSA 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 OHSA and the regulations. It is not intended to replace the OHSA 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 OHSA 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 for attending today and helping make workplaces safer.

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