Mining Webinar: Be prepared for Ministry of Labour inspection blitz - Mobile equipment in mines and mining plants
August 23, 2018
Welcome to the webinar: Be prepared for MOL inspection blitz on Mobile Equipment 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
• Mobile equipment hazards and controls
• WSN information and resources
• What Ministry of Labour (MOL) Mining Health and Safety Inspectors will be looking for during the mobile equipment blitz
• Ontario requirements pertaining to mobile equipment in the workplace in mines and mining plants (Occupational Health and Safety Act, Regulation 854)
• Q & A
The purpose of the inspection blitz:

• Ensure the workplace parties are complying with the OHSA and its regulations including:
  ▪ Traffic management programs
  ▪ Equipment maintenance
  ▪ Worker visibility
  ▪ Worker training
  ▪ Risk assessment and risk management
The purpose of the inspection blitz (continued...):

• Raise and promote the awareness of employers, supervisors and workers about hazards associated with mobile equipment to better understand the risks associated with:
  ▪ Exposures to operating and working around mobile equipment
  ▪ Operating equipment around open holes
  ▪ Conducting maintenance work
  ▪ Mobile-to-mobile interaction
  ▪ Pedestrian-to-mobile interaction

• Increase awareness of having a functioning traffic management and equipment maintenance programs.
Workplace Health and Safety Snapshot for Ontario Mining Sector in 2017

21,423 Full-time employees

1,881 Injury Disease Work-related fatalities

911 Total injuries

147 Lost-time injuries

4.25 Total injury rate per 100 workers

+3.66% 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

- 37% 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)
- 24% Contact with objects or equipment (struck by object, caught in, crushed, or compressed by equipment, objects, or collapsing materials, abraded by friction or pressure)
- 16% Falls (falls or jumps to lower level and falls on same level)
- 23% All others (highway and non-highway incidents; contact with temperature extremes; exposure to air pressure changes, harmful noxious or allergic substances, radiation, traumatic event, exposure)

Most common lost-time injuries

- 55 Bodily reaction and exertion, includes injuries and illnesses resulting from repetitive motion, bending, climbing, crawling, reaching, twisting, slipping, tripping, overexertion in lifting, pulling, pushing, carrying or turning objects.
- 36 Contact with objects and equipment, includes struck by falling, flying, swinging or sipping object, struck by or against object, stepped on object, struck by rolling, sliding, or shifting object, compressed by equipment or object, rubbed or abraded by foreign matter or other cause.
- 23 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

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

## Workplace Safety North - Mining, Other Steel Sector

### Lost Time Injuries by Incident Type: 2012-2016

Based on March 2017 Snapshot

<table>
<thead>
<tr>
<th>Incident Type</th>
<th>RG 110</th>
<th>%</th>
<th>RG 113</th>
<th>%</th>
<th>RG 119</th>
<th>%</th>
<th>RG 352</th>
<th>%</th>
<th>TOTAL</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Contact with objects</td>
<td>101</td>
<td>35%</td>
<td>88</td>
<td>25%</td>
<td>55</td>
<td>28%</td>
<td>170</td>
<td>30%</td>
<td>414</td>
<td>30%</td>
</tr>
<tr>
<td>Falls</td>
<td>51</td>
<td>18%</td>
<td>21</td>
<td>6%</td>
<td>37</td>
<td>19%</td>
<td>68</td>
<td>12%</td>
<td>177</td>
<td>13%</td>
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<tr>
<td>Bodily reaction and exertion</td>
<td>87</td>
<td>30%</td>
<td>169</td>
<td>49%</td>
<td>80</td>
<td>40%</td>
<td>244</td>
<td>43%</td>
<td>580</td>
<td>41%</td>
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<tr>
<td>Exposure to harmful substances or environments</td>
<td>17</td>
<td>6%</td>
<td>31</td>
<td>9%</td>
<td>11</td>
<td>6%</td>
<td>51</td>
<td>9%</td>
<td>110</td>
<td>8%</td>
</tr>
<tr>
<td>Transportation incidents</td>
<td>20</td>
<td>7%</td>
<td>25</td>
<td>9%</td>
<td>15</td>
<td>5%</td>
<td>18</td>
<td>3%</td>
<td>78</td>
<td>6%</td>
</tr>
<tr>
<td>Fires and explosions</td>
<td>2</td>
<td>1%</td>
<td>4</td>
<td>1%</td>
<td>0</td>
<td>0%</td>
<td>8</td>
<td>1%</td>
<td>14</td>
<td>1%</td>
</tr>
<tr>
<td>Assaults or violent acts</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>1</td>
<td>&lt;1%</td>
<td>1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Other events or exposures/NA</td>
<td>8</td>
<td>3%</td>
<td>9</td>
<td>3%</td>
<td>2</td>
<td>1%</td>
<td>9</td>
<td>2%</td>
<td>28</td>
<td>2%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>286</td>
<td>100%</td>
<td>347</td>
<td>100%</td>
<td>200</td>
<td>100%</td>
<td>569</td>
<td>100%</td>
<td>1,402</td>
<td>100%</td>
</tr>
</tbody>
</table>

**RG=Rate Group**

**NOTE:** Percentage may not add due to rounding.
• From 2012 to 2016, there were 14 traumatic fatal injuries in Ontario mining, steel and other smelting sector for the top 7 incident categories.

• Three (3) of the fatal injuries involve mobile equipment.

2013 - Worker was fatally injured in a motor vehicle when it was in a collision with another vehicle.

2015 - A worker was involved in an underground rail haulage accident which fatally injured the worker.

2015 - A worker was struck by a piece of equipment.
Traffic Management Program

- Develop and maintain a written traffic management program including:
  - Measures and procedures to prevent motor vehicle collisions by addressing hazards related to reduced visibility of motor vehicle operators.
  - Protect the health and safety of workers who may be endangered by a moving motor vehicle.
- The program must be reviewed at least annually.
Equipment Maintenance Program

• Comprehensive preventive maintenance is essential to reducing hazards associated with mobile equipment including:
  ▪ Ensure maintenance program is in placed and strictly followed
  ▪ A risk assessment to create an inventory of tasks for preventive maintenance on all equipment
  ▪ A method and schedule to determine when preventive maintenance should take place
  ▪ A recording system to document tasks associated with preventive maintenance
  ▪ Supervisors to ensure preventive maintenance is taking place
• The MOL recommends CSA Class 3/Level 2 High-Visibility Safety Apparel for underground mining environments.

• Distinguishing features:
  - Parallel stripes on front
  - ‘X’ pattern on back
  - Full torso stripe
  - Markings on arms & legs

Risk Assessment and Overview of Hazards

Risk assessment process:

• Identify all hazards related to mobile equipment travel
• Assess and rate the risk, evaluate existing controls, add controls:

Overview of Hazards associated with:

• Ramp Travel
• Operating equipment around open holes
• Roadway Lighting
• Vehicle Parking
• Access to shops and equipment maintenance
• Pedestrian Visibility
Factors to consider for mobile equipment/vehicle travel on a ramp system:

- Equipment right-of-ways
- Pedestrians
- Tracking system
- Radio failure
- Power failure
- Encountering smoke or stench gas
- Breakdown on ramp
- Fog
Traffic Control - Operating mobile equipment around open holes

Factors to consider for operating mobile equipment around open holes:

• Dumping at the edge of an open hole (e.g. open stope or pass)
• Bumper design - sufficient size and secured in a fashion to prevent equipment from falling over the edge.
• Barricades and warning signs - maintained in proper condition to ensure that driving of equipment into open hole is avoided
Factors to consider:

• Ambient lighting underground and surface
• At underground entrances
• In areas adjacent to the workplace where workers are required to travel
• In circumstances where the nature of the equipment or the operation may create a hazard to a worker due to insufficient lighting
Traffic Control - Parking

Factors to consider:

• Orderly parking of equipment
• Parked vehicle with warning lights
• Chocking
• Circle check
• Vehicle start-up
• Fueling
Factors to consider:

• Clearances on entry
• Safety of workers inside the shops
• Signal person
• Remove mechanics from vulnerable positions during the positioning of vehicles
• Procedures for working on tires and assemblies
• Chocking
Technology

The implementation of a collision management system:

- Cameras
- Radio frequency identification (RFID) tracking system
- Proximity detection
- Levels of intervention
  - Use of strobe lights in the back of hard hats
  - Use of strobe lights mounted on walls where service crew are performing work

The advent of battery/electrically propelled haulage vehicles:

- Quiet
Visibility Awareness Training

No single measure is as important in reducing the number of incidents and the likelihood of incidents as training workers.

Training should focus on:

• Visibility/line-of-sight information
• Specific visibility and travel risks that can be encountered underground
• Pedestrians trained to use eyes and ears, safety bays and lamp signals
• Operators trained in emergency warning devices and procedures in the event of mechanical failure
• Training for both operators and pedestrians in any warning systems the company is using
Information and Resources

- Ministry of Labour (MOL) Information Bulletin: Vehicle/mobile equipment and visibility hazards in mining workplaces
  Free download

- MOL Guideline: High visibility safety apparel for Mines and Mining Plants
  Free download
**Information and Resources**

- **Ministry of Labour (MOL) Information Bulletin: Working with Wheel Rims and Tire Assemblies**
  Free download

- **MOL Guideline: Brakes for vehicles in mines**
  Free download
Information and Resources

- **WSN Technical Report: Pedestrian - mobile equipment visibility**
  
  [https://www.workplacesafetynorth.ca/resources/pedestrian-mobile-equipment-visibility-guideline](https://www.workplacesafetynorth.ca/resources/pedestrian-mobile-equipment-visibility-guideline)

  Free download

  
  For branding and posting on WSN’s website

- **WSN Technical Report: Safe operation of remote controlled equipment**
  
  [https://www.workplacesafetynorth.ca/resources/safe-operation-remote-controlled-equipment](https://www.workplacesafetynorth.ca/resources/safe-operation-remote-controlled-equipment)

  Free download
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IMPORTANT NOTE RE: Mobile Equipment

• 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.

• MOL inspectors will also check for compliance with other requirements under the OHSA and its regulations, such sections 25, 26, 27, and 28 of the OHSA that set out the general duties of all employers, supervisors, and workers.

• Inspectors will take enforcement action, as appropriate, if they find violations of the requirements in OHSA and any of its regulations.
Rationale:

• Interaction between workers and mobile equipment continues to be the leading cause of injury and death to workers in the mining industry. Between 2000 and 2017, 16 workers died in Ontario mines as a result of fatal interaction with a vehicle or mobile equipment, including collisions.

• The Mining Health, Safety, and Prevention Review, completed in 2015, identified interactions with mobile equipment as one of five hazard themes to be focused on.

• This blitz will raise awareness about the hazards of mobile equipment, and increase workplace parties’ understanding about the risks associated with operating mobile equipment in mines and how traffic management programs can help to reduce or eliminate these hazards.
Enforcement Focus

INSPECTIONS DURING THE BLITZ WILL FOCUS ON:

**Traffic Management Programs:** Is there a written traffic management program that has been developed in consultation with the joint health and safety committee (JHSC) or health and safety representative (HSR) to prevent collisions that may endanger the health and safety of a worker?

**Equipment Maintenance:** Is equipment being properly maintained in safe working condition? Are there procedures for testing, maintenance and safe access in place?

**Material Dumping Areas:** When material is dumped by a motor vehicle, does the dump point include features to prevent the vehicle from going over the bank or into an open hole?
INSPECTIONS DURING THE BLITZ WILL FOCUS ON:

Worker Visibility: Are workers who are required to wear high visibility apparel wearing appropriate clothing and is it being maintained to ensure workers can be seen?

Worker Training: Are workers properly trained to operate and use the equipment? Are they properly supervised when it is used?

Risks Assessed and Managed: Have employers assessed the risks associated with mobile equipment operation and maintenance, and have controls been identified and put in place as appropriate?
Some examples of key mobile equipment hazards, and their associated activities, that can be found in the workplace include but are not limited to:

- being struck by or pinned by mobile equipment
- driving into an unguarded open hole underground
- colliding with obstacles or other equipment
- falling off mobile equipment while performing maintenance
- being fatigued or tired while operating equipment
Controls

Methods of eliminating or mitigating these hazards include:

• ensuring there is a traffic management program in place to prevent collisions that might endanger workers.

• putting engineering controls in place to prevent workers coming into contact with mobile equipment and to prevent collisions.

• providing a safe means of accessing equipment during maintenance and operation.

• Ensuring a maintenance program is in place to ensure motor vehicles are in safe working condition.
• Section 5.1 requires employers to conduct a risk assessment of the workplace for the purpose of identifying, assessing and managing hazards including potential hazards that may expose a worker to injury.

• Section 5.2 requires consultation with the JHSC or HSR, if any, to develop and maintain measures to eliminate the hazards and potential hazards identified in the risk assessment.

• Section 5.3 requires a review annually or as often as necessary.
Reg. 854 - Mines and Mining Plants

- Section 46 requires a safe means of access to a workplace shall be provided during operation and when being maintained or serviced.

- Section 103 requires motor vehicle on rails be in safe condition, including having:
  - brakes that will stop and hold the vehicle under full load,
  - head lights,
  - an audible warning system,
  - guard in place to protect the operator during a collision and
  - safe guards in place when operated in remote control.

- Section 104 requires trains to have a tail light unless operated in areas where natural or artificial lighting provides good visibility.
• Subsection 105 (1) sets out requirements for a motor vehicle, including but not limited to that it:
  • Be in safe working condition, including having brakes that will stop and hold the vehicle under full load on all grades, slopes and ramps;
  • Have head lights and tail lights, unless there is adequate natural or artificial lighting to allow the operator a clear view;
  • When operated by remote control, be arranged so that, in the event of a failure, the vehicle will be brought to a stop; and
  • When operated in reverse and the operator or another person may be endangered, have a worker stationed to direct and warn the operator of any hazard.
Subsection 105 (3) requires that, where the view of the operator of a motor vehicle is limited in the direction of travel, the vehicle must be equipped with an audible alarm that is activated before the vehicle is put in motion.

Subsection 105 (5) requires a motor vehicle to have windows consisting of safety glass maintained to provide an unobstructed view and have procedures in place for testing, maintenance and inspection.

Subsection 105 (6) requires there be procedures to control and govern the movement of vehicles with a restricted operator view because of their size or design, shall be established to govern movement of such vehicles and other vehicles and pedestrians.
Subsection 105(7) requires that procedures for testing, maintenance and inspection be adopted, including:

- Scheduling the testing of brakes, steering and lighting prior to initial use,
- Scheduling the motor vehicle for routine inspections,
- Itemizing tests following maintenance,
- Providing records of the testing, inspections and maintenance carried out, and
- Providing that testing, inspections and maintenance be performed by a competent person.
• Section 105.1 requires an employer at a mine to develop, in consultation with the JHSC or HSR, if any, a written traffic management program containing measures and procedures to prevent collisions of motor vehicles that might endanger a worker, and protect the safety of workers who may be endangered by the movement of vehicles. A copy of the program must be given to the JHSC or HSR, and the program must be reviewed annually.

• Section 106 sets out requirements for vehicles on ramps, as well as the steps to be taken to warn approaching traffic where a motor vehicle is disabled or parked on a roadway.
Section 107 requires a motor vehicle be equipped with wheel chocks that comply with SAE Standard J348 Jun90 “Wheel Chocks”. Wheel chocks must be used to block movement whenever a vehicle is left unattended or is being maintained unless an alternate means for blocking movement has been developed in consultation with the JHSC or HSR, if any.

Section 107.1 sets out requirements for written procedures for work on tire and wheel assemblies.

Section 108 sets out requirements when the controls of specific types of equipment are left unattended.

Subsection 109(2) requires that rail tracks be in good working condition.
• Section 116 requires haulage roads on surface be designed and maintained to minimize slipping, enable safe passing, and avoid steep grades. A suitable barrier on the open side of the ramp must be provided.

• Section 118 requires that when material is dumped from a vehicle occupied by a person, the vehicle must have features designed to prevent it from going over the bank. In an underground mine, these features cannot include the use of a ridge of material.

• Sections 119, 119.1 and 119.2 sets out requirements for various brake systems, including commissioning tests and use of automatic brakes.
Resource Material

• **Occupational Health and Safety Act**

• **Regulations for Mines and Mining Plants**

• **Vehicle/Mobile Equipment and Visibility Hazards in Mining Workplaces**

• **Working with Wheel Rims and Tire Assemblies**

• **https://www.workplacesafetynorth.ca/resources/pedestrian-mobile-equipment-visibility-guideline**

• **Final Report: Mining Health and Safety Prevention Review**
Thank you

Questions or Comments?
Thank you for attending today and helping make workplaces safer.

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