Vehicle/Mobile Equipment and Visibility Hazards in Mining Workplaces

Workers can be at risk of serious injury due to hazards involving vehicles and mobile equipment at mines.

Various types of vehicles, including locomotives, haul trucks and mobile equipment such as loaders and excavators can be found in mining workplaces. Incidents involving these vehicles have resulted in worker injuries, deaths and damage to property. There have also been a number of “near misses” in which incidents could have occurred. Visibility is an issue in about half of all mining fatalities involving mobile equipment, according to Workplace Safety North.

Duties under the Occupational Health and Safety Act

Employers, supervisors, and workers have duties under the Occupational Health and Safety Act (OHSA) and the Regulation for Mines and Mining Plants. Below are some duties that apply to vehicle/mobile equipment and visibility hazards.

Employers

- Ensure workers are provided with information, training and supervision to protect their health and safety. This may include training vehicle operators on a workplace’s rules for safe operation of vehicles, such as for speed limits, stopping at intersections, and hand and horn signals.
- Ensure equipment and protective devices are maintained in good condition.
- Take every precaution reasonable in the circumstances to protect workers from vehicle hazards. This may include developing a traffic management program to protect vehicle operators and nearby workers, or other controls such as those mentioned below.
- Develop procedures to control and govern the movement of vehicles, other vehicles and pedestrians, where such vehicles restrict the view of the operator because of size or design.
- Ensure that motor vehicles, other than motor vehicles running on rails, are operated only by a competent operator except for purposes of training or testing.
• Ensure workers wear retro-reflective material on headgear and outer clothing that enables the worker to be seen when working underground or between sunset and sunrise in surface operations.

• Provide effective illumination when insufficient lighting may exist due to the nature of the equipment or operation.

• Illumination shall be provided in an underground mine adequate for a worker to visually assess ground conditions at the worker’s workplace.

• Ensure traffic control procedures are established, including a provision for the control of emergency situations, where a motor vehicle is operated on a grade or ramp.

• Ensure safety stations are of adequate size and plainly marked.

**Supervisors**

• Take every precaution reasonable in the circumstances for the protection of workers.

• Ensure workers comply with the OHSA and Regulation for Mines and Mining Plants.

• Ensure workers use any equipment, protective devices or clothing required by the employer.

• Advise workers of the existence of any potential or actual hazards of which the supervisor is aware. This may include vehicle traffic hazards.

**Workers**

• Report any traffic-related hazards, as well as any contraventions, to your supervisor or employer.

• Work in compliance with the OHSA and Regulation for Mines and Mining Plants.

• Use or wear the personal protective equipment that your employer requires to be used or worn.

• Do not use or operate equipment or machines or work in a manner that may endanger yourself or any other worker.

**Best practices**

When possible, engineering controls should be developed and implemented to separate moving vehicles from nearby workers on foot. Administrative controls should be considered when separation of vehicles and nearby workers is not possible. Administrative controls could include rules of the road, markings and signage, use of signallers, and personal protective equipment (high visibility clothing). The following are
recommended best practices that an employer can consider implementing to protect a worker from vehicle/mobile equipment and visibility hazards.

**Engineering controls**

- Install barriers to separate pedestrians and vehicle areas.
- Designate routes for workers who work in close proximity to moving vehicles so they avoid vehicle traffic (surface mines).
- Install appropriate barriers and lighting at dumping points.
- Take traffic flows into consideration and plan parking locations to minimize interaction of larger and smaller vehicles.
- Install appropriate area and vehicle lighting and develop an awareness of hazards caused by glare from natural or artificial lights.
- Install assistive devices on vehicles or in the workplace to improve visibility. This should include:
  - warning lights to indicate the presence of vehicles/pedestrians in the workplace
  - devices on vehicles such as mirrors, proximity sensing/viewing devices such as cameras, reversing alarms, communication radios and warning lights.
- When designing mines, take visibility-related hazards and clearance requirements (walls and back) into consideration for equipment operators and nearby workers on foot.
- Eliminate and/or be aware of blind spots on mobile equipment and vehicles, especially when implements (such as forks or buckets) are in a raised position.
- Install appropriate and well maintained lights and striping on all vehicles.
- Ensure computer displays or other equipment added to a vehicle’s cab meet manufacturers’ recommendations and are sized and located so they don’t interfere with an operator’s view.
- Avoid hazards involving haulageway “clearance” (space needed to pass through a haulageway) when possible, or ensure the clearance is clearly marked.
- Properly locate safety stations on haulageways.

**Administrative controls**

- Create a Traffic Management Program: A written traffic management program for workplace traffic can reduce the risk of incidents between vehicles and nearby
workers. The program could address site and task specific risks and should contain the following components:

▪ Before creating the program, a workplace traffic assessment is recommended to identify:
  ▫ vehicle routes and walking routes for nearby workers
  ▫ areas with greater collision risk due to the type of vehicle, pedestrian activities and/or area layout.
  ▫ areas where tramming routes overlap with other activities.

▪ All workers must be trained on the program. Temporary workers and contractors must also be aware of the program.

▪ Interactive training should be provided to help operators and nearby workers see and understand what an operator can and cannot see. For example, trainers may want to have workers sit in the driver’s seat to better understand visibility limitations.

• Implement communication protocols, warning signs, lights or other safeguards to protect workers around vehicle traffic.

• Use competent signallers.

• Monitor compliance with the program. This should be done by supervisors and could include observations at important intersections or along passageways, observations of vehicle markings and reflective striping on workers and/or monitoring of radio traffic.

Personal Protective Equipment (PPE)

• Provide workers in close proximity to vehicles with high visibility apparel.
  ▪ For further information please refer to the Ministry of Labour document on High Visibility Safety Apparel (HVSA) for Mines and Mining Plants including information on care and maintenance of HVSA.

• Consider adding auxiliary lights to hard hats in dark conditions.

• Clean dirty helmet striping and/or lights before entering travel areas. The hard hat is the highest point on a worker and so most likely to be seen.

Some questions for employers to consider

1. Is there a written traffic management program in place?
   a) Have you completed an assessment to identify hazards and ensure appropriate traffic management measures and procedures have been identified and implemented?
b) Are you ensuring the reporting of “near miss” incidents with vehicles and pedestrians to assist you in traffic planning?

c) What measures and procedures have been taken to separate vehicle traffic from workers on foot?

2. Do you have measures and procedures to ensure safe interaction between vehicles, equipment and workers on foot?

   a) Has your workplace’s Joint Health and Safety Committee or Worker Health and Safety Representative been consulted?

   b) Have workers been trained in these measures and procedures?

3. Do work lineups include location of equipment operation and instructions to workers on necessary precautions, including communication if entering an area where equipment may be operating? Are contractors or other visitors to your workplace aware of the vehicle hazards and instructed to follow the necessary measures and procedures for their safety?

4. Have you considered if specific equipment or vehicles could assist in safe interaction and collision avoidance at the workplace?

5. Have you identified situations where your workplace requires the use of a competent signaller?

6. Have you ensured any displays or other equipment added to the vehicle meet manufacturers’ recommendations and do not interfere with the operator’s view?

7. Have you determined if workers need PPE such as high-visibility apparel or additional lighting to enhance their visibility to vehicle operators?

8. If there is a system (lights, communications, signage, reflectors etc.) to indicate workers/vehicles on a ramp or in a work area, is it working effectively? Have workers been trained? Does everyone understand how to use it correctly?

9. Does your workplace’s engineered design meet the clearance requirements to safely operate large equipment?

More information

Mobile Equipment
Ministry of Labour
Ontario.ca/labour

Pedestrian/Mobile Equipment Visibility
Workplace Safety North (WSN)
www.workplacesafetynorth.ca
E-Laws – Occupational Health and Safety Act and related regulations
www.elaws.gov.on.ca

CAN/CSA-B335-04 (R2012) – Safety Standard for Lift Trucks

Toll-free number

Call 1-877-202-0008 any time to report critical injuries, fatalities or work refusals. Call 8:30 a.m. to 5 p.m. Monday to Friday for general questions about workplace health and safety. **Always call 911 in an emergency.**

**Disclaimer:** This resource has been prepared to assist workplace parties in understanding some of their obligations under the OHSA and its regulations. It is not intended to replace the OHSA or its regulations — reference should always be made to the official version of the legislation.

It is the responsibility of workplace parties to ensure compliance with the legislation. This resource does not constitute legal advice. If you require assistance regarding interpretation of the legislation and its potential application in specific circumstances, please contact your legal counsel.

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

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