MINE HEALTH AND SAFETY ADMINISTRATION

MSHA POWERED HAULAGE SAFETY INITIATIVE

WYOMING MINING ASSOCIATION
SAFETY SHOW – CASPER, WY
November 10, 2021

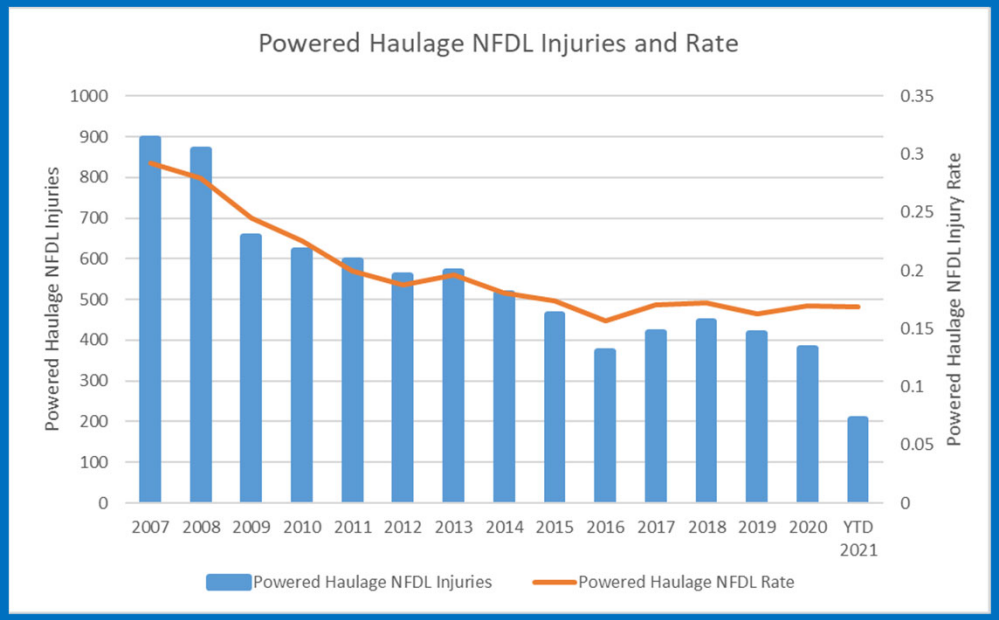
Accident Trends

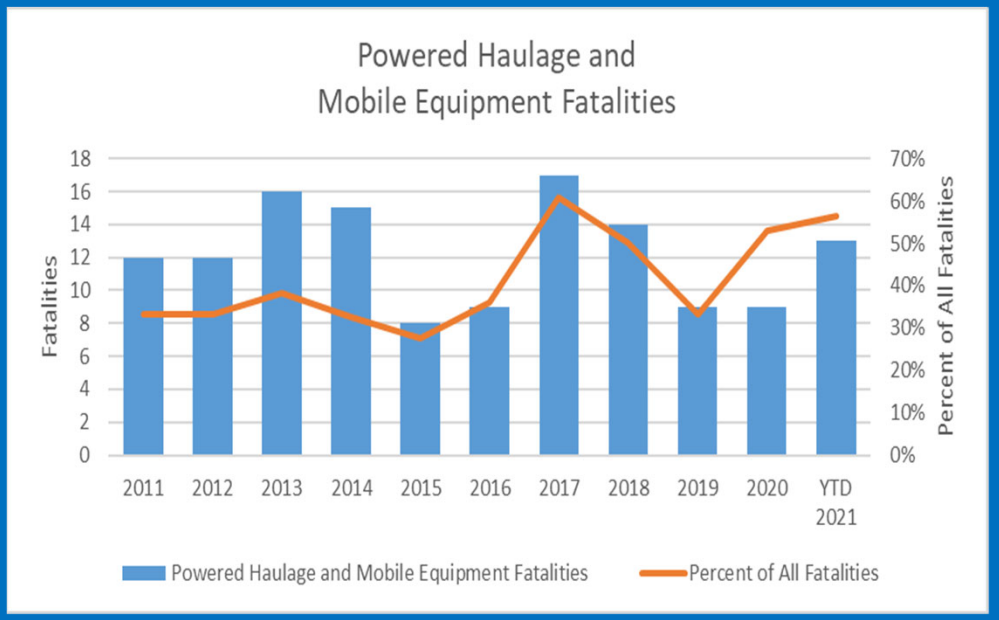
- 2021 year to date
  - 10 Powered Haulage accidents that resulted in 11 fatalities
  - Over 200 Powered Haulage injuries

    Highest rate of Powered Haulage fatalities since 2006

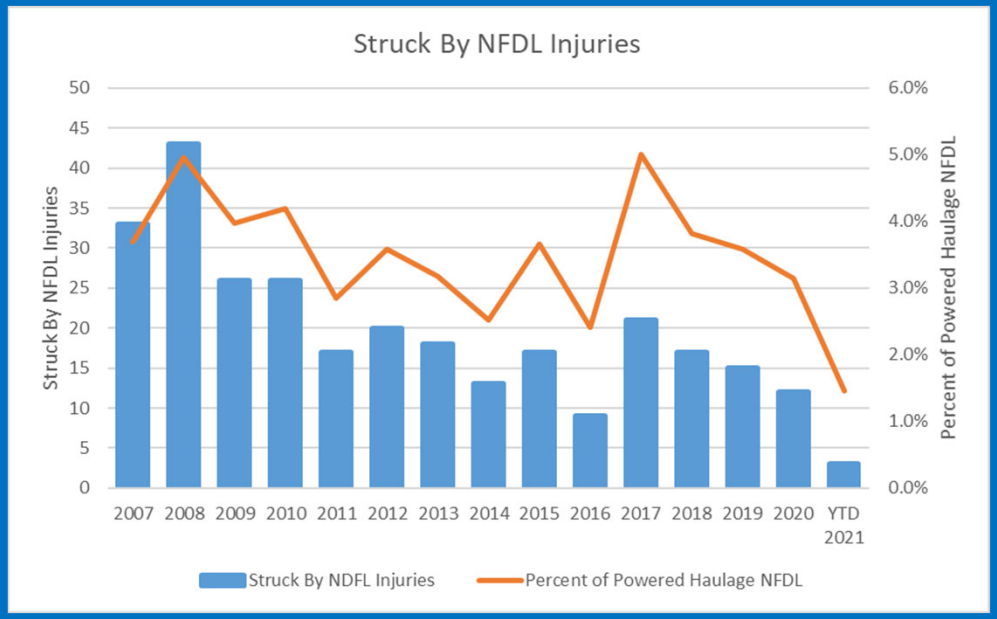
- Powered Haulage includes: motors and rail cars, conveyors, belt feeders, longwall conveyors, bucket elevators, vertical manlifts, self-loading scrapers or pans, shuttle cars, haulage trucks, front-end loaders, load-haul-dumps, forklifts, and others.

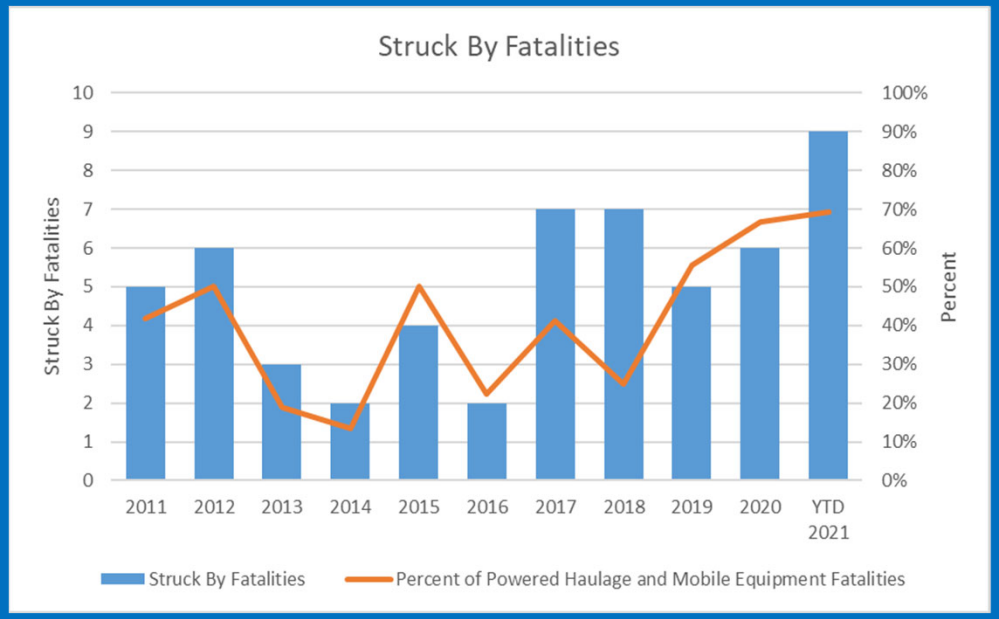
Accident Trends



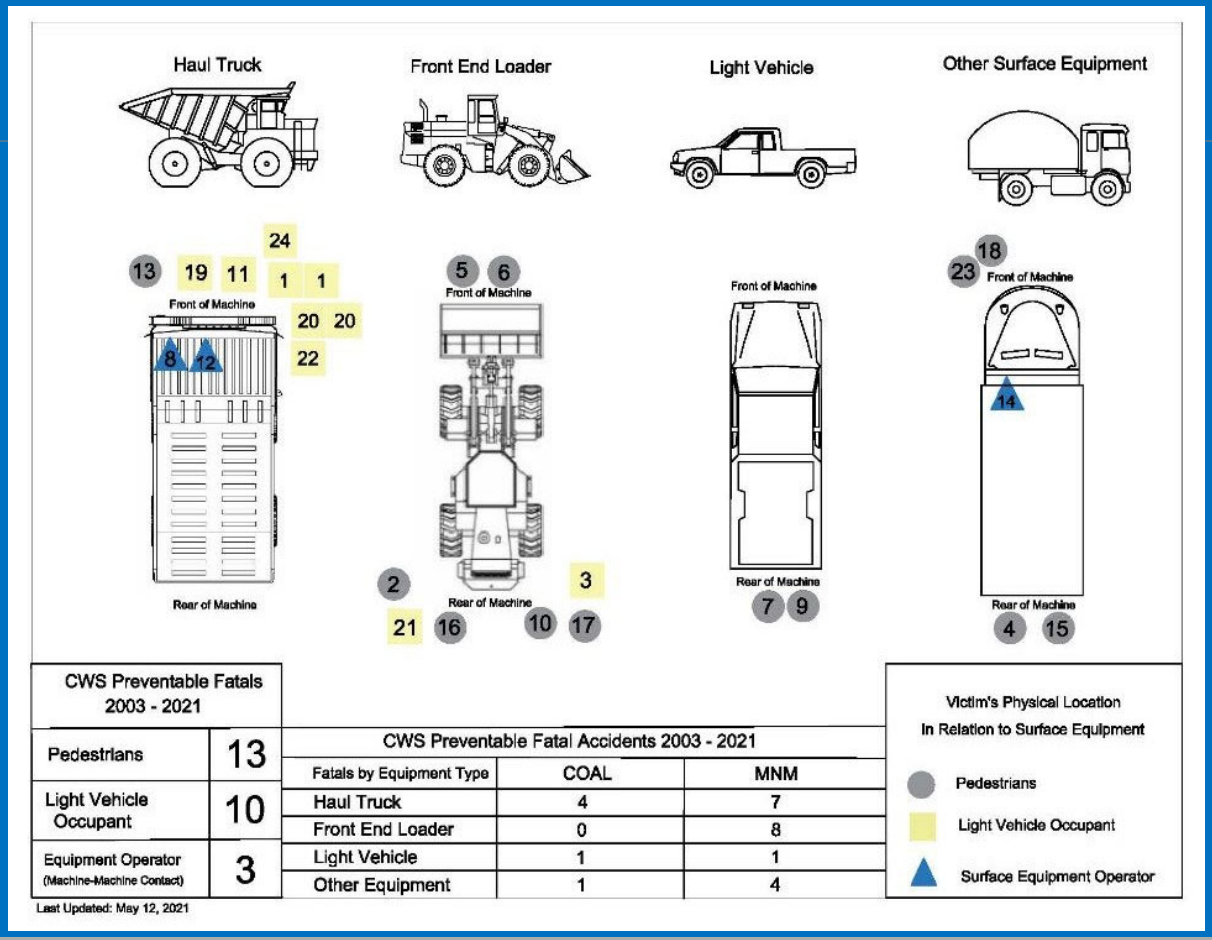


Accident Trends





Surface Equipment Accident Locations



CWS Preventable Fatals 2003 - 2021	
Pedestrians	13
Light Vehicle Occupant	10
Equipment Operator (Machine-Machine Contact)	3

CWS Preventable Fatal Accidents 2003 - 2021

Fatals by Equipment Type	COAL	MNM
Haul Truck	4	7
Front End Loader	0	8
Light Vehicle	1	1
Other Equipment	1	4

Victim's Physical Location In Relation to Surface Equipment

- Pedestrians
- Light Vehicle Occupant
- Surface Equipment Operator

Last Updated: May 12, 2021

MSHA Powered Haulage Safety Initiative

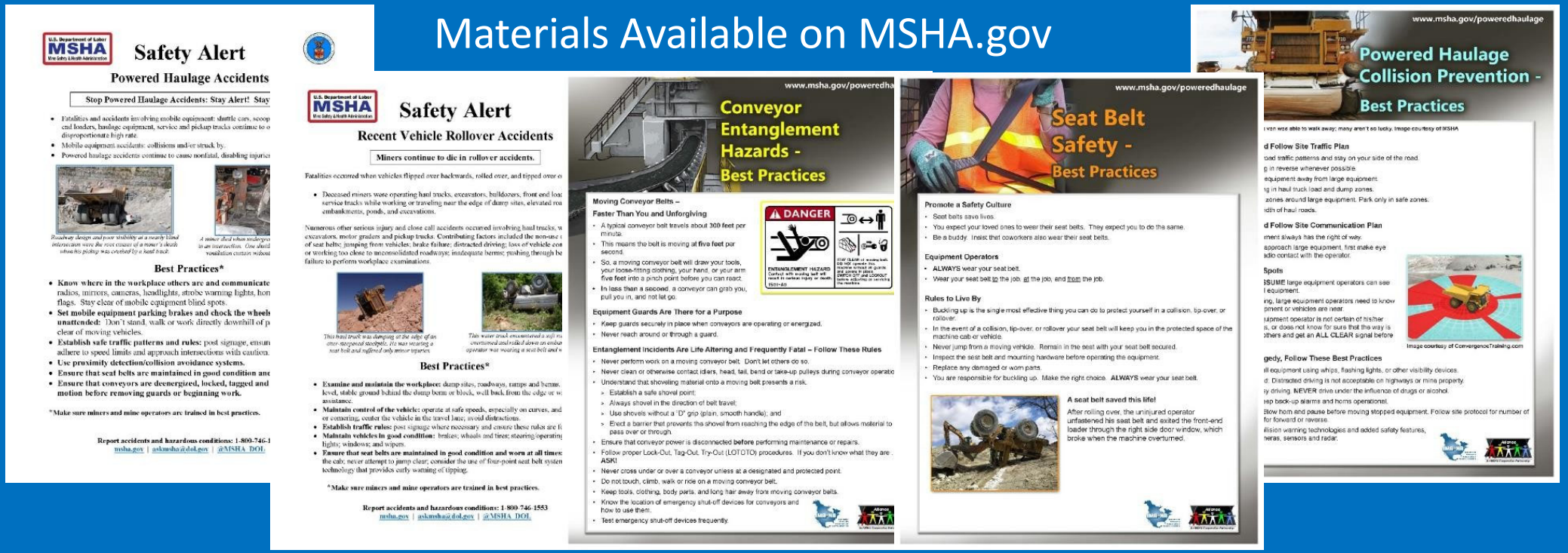
MSHA Powered Haulage Safety Initiative

Stand Down for Safety Day

- MSHA Enforcement visited 1,500 mine sites
  - MSHA District Managers
  - MSHA Assistant District Managers
  - Inspectors
  - Educational Field and Small Mines staffing
- Guidance to prevent Powered Haulage and rollover accidents
  - Best Practices
  - Videos
  - Training Resources
  - Stickers

MSHA Powered Haulage Safety Initiative

Materials Available on MSHA.gov



Safety Alert

Powered Haulage Accidents

Stop Powered Haulage Accidents: Stay Alert! Stay

- Fatalities and accidents involving mobile equipment: shuttle cars, scoop end loaders, haulage equipment, service and pickup trucks continue to o disproportionate high rate.
- Mobile equipment accidents: collisions and/or struck by.
- Powered haulage accidents continue to cause nonfatal, disabling injuries

Roadway design and poor visibility at a nearly blind intersection were the root cause of a miner's death when his pickup was overtaken by a haul truck.

A miner died when undergro in an intersection. One shield ventilation curtain without

Best Practices*

- **Know where in the workplace others are and communicate** radios, mirrors, cameras, headlights, strobe warning lights, hon flags. Stay clear of mobile equipment blind spots.
- **Set mobile equipment parking brakes and chock the wheels unattended:** Don't stand, walk or work directly downhill of p clear of moving vehicles.
- **Establish safe traffic patterns and rules:** post signage, ensur adhere to speed limits and approach intersections with caution.
- **Use proximity detection/collision avoidance systems.**
- **Ensure that seat belts are maintained in good condition and**
- **Ensure that conveyors are deenergized, locked, tagged and motion before removing guards or beginning work.**

*Make sure miners and mine operators are trained in best practices.

Report accidents and hazardous conditions: 1-800-746-1
msha.gov | askmsha@dol.gov | @MSHA_DOL

Safety Alert

Recent Vehicle Rollover Accidents

Miners continue to die in rollover accidents.

Fatalities occurred when vehicles flipped over backwards, rolled over, and tipped over o

- Deceased miners were operating haul trucks, excavators, bulldozers, front end loa service trucks while working or traveling near the edge of dump sites, elevated roa embankments, ponds, and excavations.

Numerous other serious injury and close call accidents occurred involving haul trucks, w excavators, motor graders and pickup trucks. Contributing factors included the non-use of of seat belts; jumping from vehicles; brake failure; distracted driving; loss of vehicle con or working too close to unconsolidated roadways; inadequate berms; pushing through be failure to perform workplace examinations.

This haul truck was dumping at the edge of an over-exposed stockpile. He was wearing a seat belt and suffered only minor injuries.

This water truck encountered a soft ro overturned and rolled down an embar operator was wearing a seat belt and s

Best Practices*

- **Examine and maintain the workplace:** dump sites, roadways, ramps and berms, level, stable ground behind the dump berm or block, well back from the edge or w assistance.
- **Maintain control of the vehicle:** operate at safe speeds, especially on curves, and er cornering, center the vehicle in the travel lane; avoid distractions.
- **Establish traffic rules:** post signage where necessary and ensure these rules are fi
- **Maintain vehicles in good condition:** brakes; wheels and tires; steering/operating lights; windows; and wipers.
- **Ensure that seat belts are maintained in good condition and worn at all times:** the cab; never attempt to jump clear; consider the use of four-point seat belt system technology that provides early warning of tipping.

*Make sure miners and mine operators are trained in best practices.

Report accidents and hazardous conditions: 1-800-746-1553
msha.gov | askmsha@dol.gov | @MSHA_DOL

www.msha.gov/poweredha

Conveyor Entanglement Hazards - Best Practices

Moving Conveyor Belts –

Faster Than You and Unforgiving

- A typical conveyor belt travels about **300 feet** per minute.
- This means the belt is moving at **five feet** per second.
- So, a moving conveyor belt will draw your tools, your loose-fitting clothing, your hand, or your arm five feet into a pinch point before you can react.
- In less than a second, a conveyor can grab you, pull you in, and not let go.

DANGER

ENTANGLEMENT HAZARD
Contact with moving belt will result in serious injury or death.

Equipment Guards Are There for a Purpose

- Keep guards securely in place when conveyors are operating or energized.
- Never reach around or through a guard.

Entanglement Incidents Are Life Altering and Frequently Fatal – Follow These Rules

- Never perform work on a moving conveyor belt. Don't let others do so.
- Never clean or otherwise contact idlers, head, tail, bend or take-up pulleys during conveyor operatio
- Understand that shoveling material onto a moving belt presents a risk.
  - Establish a safe shovel point;
  - Always shovel in the direction of belt travel;
  - Use shovels without a "D" grip (plain, smooth handle); and
  - Erect a barrier that prevents the shovel from reaching the edge of the belt, but allows material to pass over or through.
- Ensure that conveyor power is disconnected **before** performing maintenance or repairs.
- Follow proper Lock-Out, Tag-Out, Try-Out (LOTOTO) procedures. If you don't know what they are : ASK!
- Never cross under or over a conveyor unless at a designated and protected point.
- Do not touch, climb, walk or ride on a moving conveyor belt.
- Keep tools, clothing, body parts, and long hair away from moving conveyor belts.
- Know the location of emergency shut-off devices for conveyors and how to use them.
- Test emergency shut-off devices frequently.

www.msha.gov/poweredhaulage

Seat Belt Safety - Best Practices

Promote a Safety Culture

- Seat belts save lives.
- You expect your loved ones to wear their seat belts. They expect you to do the same.
- Be a buddy. Insist that coworkers also wear their seat belts.

Equipment Operators

- **ALWAYS** wear your seat belt.
- Wear your seat belt to the job, at the job, and from the job.

Rules to Live By

- Buckling up is the single most effective thing you can do to protect yourself in a collision, tip-over, or rollover.
- In the event of a collision, tip-over, or rollover your seat belt will keep you in the protected space of the machine cab or vehicle.
- Never jump from a moving vehicle. Remain in the seat with your seat belt secured.
- Inspect the seat belt and mounting hardware before operating the equipment.
- Replace any damaged or worn parts.
- You are responsible for buckling up. Make the right choice. **ALWAYS** wear your seat belt.

A seat belt saved this life!

After rolling over, the uninjured operator unfastened his seat belt and exited the front-end loader through the right side door window, which broke when the machine overturned.

www.msha.gov/poweredhaulage

Powered Haulage Collision Prevention - Best Practices

…van was able to walk away; many aren't so lucky. Image courtesy of MSHA

d Follow Site Traffic Plan

…oad traffic patterns and stay on your side of the road.
…g in reverse whenever possible.
…equipment away from large equipment.
…g in haul truck load and dump zones.
…zones around large equipment. Park only in safe zones.
…idth of haul roads.

d Follow Site Communication Plan

…ment always has the right of way.
…approach large equipment, first make eye …adio contact with the operator.

Spots

…SUME large equipment operators can see …l equipment.
…ng, large equipment operators need to know …pment or vehicles are near.
…uipment operator is not certain of his/her …s, or does not know for sure that the way is …thers and get an **ALL CLEAR** signal before

Image courtesy of ConvergenceTraining.com

…gedy, Follow These Best Practices

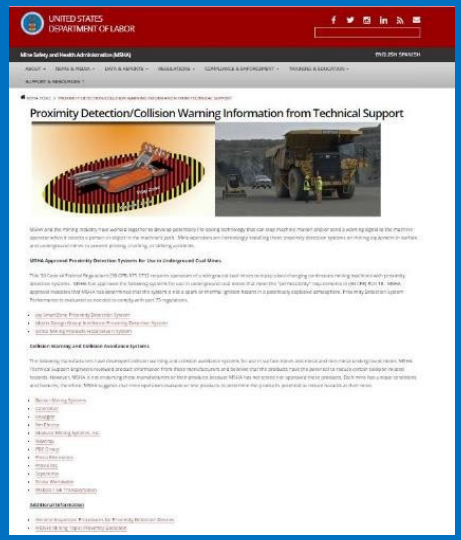
…ll equipment using whips, flashing lights, or other visibility devices.
…d. Distracted driving is not acceptable on highways or mine property.
…y driving. **NEVER** drive under the influence of drugs or alcohol.
…ep back-up alarms and horns operational.
…Blow horn and pause before moving stopped equipment. Follow site protocol for number of …for forward or reverse.
…ision warning technologies and added safety features, …eras, sensors and radar.

https://www.msha.gov/news-media/special-initiatives/2021/07/12/powered-haulage-safety

MSHA Powered Haulage Safety Initiative

Proximity Detection/Collision Warning Information from Technical Support on MSHA.gov

- Regulation information
- Resource for mine operators to connect with technology providers
- Contact MSHA to request adding links to the page



https://www.msha.gov/proximity-detectioncollision-warning-information-technical-support

MSHA Powered Haulage Safety Initiative

Areas of Focus

- Powered Haulage safety at surface mines
- Powered Haulage safety at underground mines
- Conveyor safety at surface and underground mines

MSHA Powered Haulage Safety Initiative

- Powered Haulage safety at surface mines
  - Improving visibility
  - Communication
  - Traffic management
  - Seat belt use
  - Dumping practices

MSHA Powered Haulage Safety Initiative

- Powered Haulage safety at underground mines
  - Audible and visual warnings
  - Traffic management
  - Cameras and proximity detection
  - Communication and training

MSHA Powered Haulage Safety Initiative

- Conveyor safety at surface and underground mines
  - Equipment guards
  - Working around belt conveyors
  - Crossover safety
  - Conveyor design, installation, and housekeeping

MSHA Potential for Technology

- MSHA Technical Support analyzed fatal surface mining accidents that occurred from January 2003 to July 2021 and found 24 fatal accidents (26 fatalities) that collision warning systems could have prevented.

- MSHA Technical Support analyzed fatal underground mining accidents that occurred on the working section from January 1984 to July 2021 and found 91 fatal accidents that proximity detection systems could have prevented.

MSHA Potential for Technology

- Technology uses at underground and surface mines
- MSHA continues to fully support the increased usage of technology to prevent vehicle to vehicle and vehicle to pedestrian collisions.
  - Proximity detection systems
  - Collision avoidance systems
  - Collision warning systems

Summary

- MSHA Powered Haulage Safety Initiative
- MSHA Potential for Technology

Questions?

U.S. Department of Labor
MSHA
Mine Safety & Health Administration