

Underground Powered Haulage

- Since September 2019, there has been a significant increase in fatal accidents involving underground powered haulage equipment
- Restricted visibility, breakdowns in communication, and inadequate policies and procedures are the root causes of these fatalities
- The following slides provide fatal accident overviews and best practices to prevent these accidents from occurring
- Mine operators are encouraged to discuss these accidents and best practices with miners

Rail Haulage

Throughout the years, there have been many fatal rail haulage accidents in underground mines. Most mines used rail haulage to transport miners, supplies, and material into or out of the mine. Many mines are replacing rail with other haulage means, including belt conveyors and rubber-tired equipment. Unfortunately, rail haulage accidents continue to occur. On February 22, 2021 and June 9, 2021, the industry experienced two separate rail haulage accidents resulting in three fatalities.

Rail Haulage



On Feb. 22, 2021, a 26-year-old underground chute puller was fatally injured as a passenger of a rail-mounted locomotive when he was crushed between the deck of the locomotive and an overhead chute.

Rail Haulage



On June 9, 2021, two miners were fatality injured when a locomotive traveling in the opposite direction collided with their Kubota RTV personnel carrier.

Rail Haulage

Before operating rail haulage equipment:

- Ensure that all safety equipment is available on the equipment including:
 - Fire Extinguisher
 - Lifting jack and bar
- Ensure that all safety devices are functioning properly:
 - Audible warning device
 - Lights
 - Radio
 - Sanders
- Examine brakes according to manufacturer's recommendations
 - Manual brakes
 - Dynamic brakes
 - Parking brake
- Ensure safety chains in the operator and passenger compartments are secured
- Secure all loose objects that may injure passengers during a sudden stop

Remember, if any safety devices or systems are missing or not operating properly, PARK the vehicle until repairs are made

Rail Haulage

Traffic Control for Underground Rail Haulage Equipment:

- Develop a system and establish a policy to notify miners when other vehicles or pedestrians may be on the intended road. Methods of regulating rail traffic include:
 - Dispatcher – Lets rail equipment operators know where other vehicles are located and directs rail traffic flow
 - Block Light System – Indicates when a rail haulage vehicle is operating in a rail section
- Do not enter the rail haulage route or section until it is clear that no other vehicles are in the path
- Ensure that you are in a safe location when rail haulage equipment approaches your location
- If switching into a spur track, assure that the spur track switch is properly aligned for the passing equipment
- Notify other rail haulage equipment operators when the track is clear for them to proceed
- Rail haulage equipment should not proceed until all other vehicles are in the clear

Rail Haulage

Operating Underground Rail Haulage Equipment:

- Operate the haulage equipment at a safe speed while considering the track's condition
- Sand the tracks when there is high humidity at the mine
- Maintain control of equipment. Operate at speeds that ensure safe stopping
- Keep all body parts within the operator's compartment while a vehicle is in motion
- Stay below the highest part of a vehicle frame or windshield, especially when travelling through low clearance areas
- Install signs and/or lights to warn miners of approaching low clearance areas and train miners to reduce speed in those areas

Supply Cars:

- When hauling supplies, ensure that the couplers on the supply cars operate properly from a safe location
- Install safety chains between supply cars and locomotive
- Secure materials on supply cars so that they do not shift during movement
- When hauling long supplies such as water lines or rails, place a supply car between the load and the locomotive to prevent the water lines or rails from entering the operator's compartment

Rail Haulage

Maintaining Underground Rail Haulage Roadway:

- Conduct travelway and track examinations to identify and mitigate hazards
- Remove water that accumulates on the railway by pumping or ditching the water away
- Install ballast along the railway to prevent low spots and kinks in the rail
- Maintain the trolley wire (if used). Properly lubricate it and remove any kinks that could cause the trolley pole to jump the wire
- Conduct regular maintenance on track switches to ensure:
 - Reflectors are installed to indicate alignment of the switch, and
 - Ensure there is proper contact with the switch latch point to avoid derailling
- Install signage along the travelway to alert rail haulage operators of potential hazards including:
 - Low clearance
 - Sharp curves
 - Approaching pedestrian traffic
 - Dips or hills along the travelway

Scoops and Shuttle Cars

Accidents involving shuttle cars and scoops striking miners have plagued the mining industry in recent years. Miners working near ventilation curtains, equipment parked in travelway blind spots, and inherent equipment visibility restrictions compound this problem. Between September 5, 2019, and June 3, 2021 the industry has seen five fatal rubber-tired haulage accidents.

Scoops and Shuttle Cars

Train all miners concerning equipment operators' restricted visibility hazards when working around ventilation curtains. Describe and demonstrate visibility restrictions.

Example

Miner seen outby curtain



Example

Miner not seen inby curtain

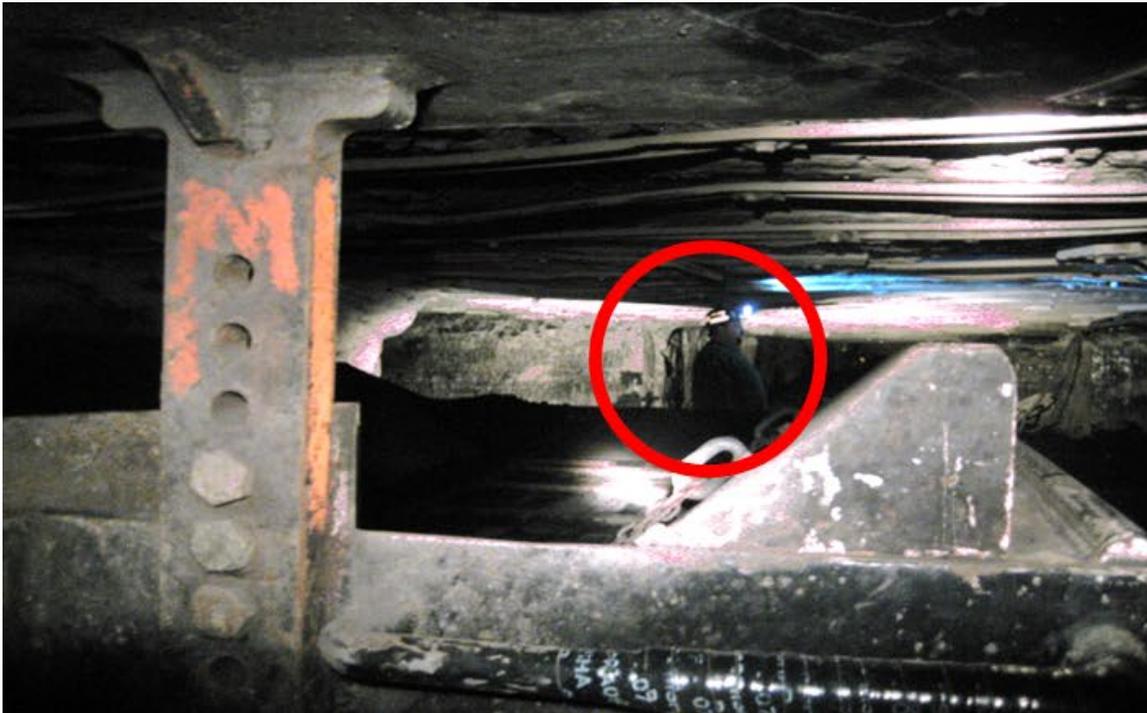


Scoops and Shuttle Cars

Train all miners concerning the equipment operators' restricted visibility hazards when operating loaded equipment.

View of Typical Unloaded vs Loaded U/G Mobile Equipment

Miner seen below



Miner not seen due to material



Scoops and Shuttle Cars



On October 13, 2020, a miner died after being struck by a battery-powered scoop. He had parked his shuttle car in an intersection and was exiting when a scoop went through a ventilation curtain in an adjacent crosscut and struck him.

Scoops and Shuttle Cars



On June 3, 2021, a 42-year-old section foreman was fatally injured when he was hit by a shuttle car. The victim was struck when he walked into the path of a loaded shuttle car that was traveling to the dump point.

Scoops and Shuttle Cars

Before operating a scoop or shuttle car:

- Conduct a pre-operational examination of the equipment:
 - Check operation of all braking systems
 - Check steering
 - Check for hydraulic fluid leaks and accumulations of grease and debris in the operator compartment
 - Examine the power cable, if applicable, for damage to the outer jacket
 - Ensure that the headlights are operational in both directions and the sounding device is functioning
 - Ensure the power cable is not anchored to a permanent roof support

Do not operate the scoop or shuttle car until defects are corrected

- Examine the intended vehicle travel route:
 - Clear all debris from the roadway
 - Check the roof and rib condition along the travel route
 - Remove or hang any equipment power cables to prevent damaging them
 - Communicate your travel route to other miners and learn alternate travel routes
 - Use translucent curtains for ventilation controls on working sections

Scoops and Shuttle Cars

When Operating a Scoop or Shuttle Car:

- Operate at safe speeds
- Communicate your presence and intended movements
- Wait until miners acknowledge your message before moving your equipment
- Assure all personnel are clear of the travel path and turning radius before moving equipment
- STOP and SOUND an audible warning alarm before tramming equipment through fly pads and other low visibility areas
- Secure loads on haulage vehicles to prevent them from falling off into roadways
- Install and maintain proximity detection systems (PDS) on mobile equipment

When Working in Areas Where Scoops and Shuttle Cars Are Operating:

- Avoid areas where equipment operators cannot readily see you, powered haulage equipment has the right-of-way
- Wear reflective clothing and strobe lights to aid visibility when working around mobile equipment
- Do not depend on being able to hear oncoming mobile equipment
- Before performing work in an active haulageway, communicate your position and intended movements to mobile equipment operators and section boss
- Hang a strobe light or other visual indicator when working in a travel or haulage route
- Wear the PDSminer wearable component and ensure it is functioning before each shift.

For more information, please visit us at the following location.

www.MSHA.gov