

Mid-Year Summary of 2013 Fatal Accidents at Metal/Nonmetal Mines with Preventative Recommendations

Nine miners in the metal and nonmetal mining industry were killed as a result of accidents from January 1 to June 30, 2013.

Four miners died as a result of **Powered Haulage** accidents. Two miners were killed in **Falling Material** accidents. One miner died in a **Machinery** accident. One miner died due to an **Explosives & Breaking Agents** accident and another miner was killed in a **Fall of Highwall** accident. One of the fatalities was a **contractor**. Three of the fatalities occurred in the first quarter of the year; six occurred in the second quarter.

Three of the fatalities occurred at underground mines; six were at surface mines. Three of the miners killed were mechanics, and two of the miners killed were supervisors. In metal/nonmetal, fatalities continue to occur that could be prevented using Lock Out Tag Out best practices. Two of these fatalities could have been prevented by disconnecting the power and assuring it is off, having each miner on the job lock the power source in the safe position, using his or her personal safety lock and tag to prevent the power from being reenergized.

When completed, a detailed investigation report of each fatality is posted on the MSHA website at: <http://www.msha.gov/fatals/fab.htm>

Here is a brief summary of these accidents:

Four persons were killed in Powered Haulage accidents.

A 58-year old mechanic with 2 years of experience was killed at a surface gypsum operation. The victim was clearing a blockage on a mobile track-mounted crusher when he became entangled in the discharge conveyor.

A 22-year old mucker with 31 weeks of experience was killed at an underground molybdenum mine. The victim was checking a derailed loaded ore car when he was pinned between it and another loaded ore car.

A 42-year old miner with 2½ years of experience was killed at an underground gold mine. The victim was operating a Load Haul Dump (LHD), preparing to backfill a stope, when the LHD went over the edge of the stope and fell into the open hole.

A 50-year old mechanic with 15 years of experience was killed at a stone operation. He was operating a 35 ton articulated haul truck down a haul road. The truck went out of control and hit a berm, propelling it in the air. The truck came to a stop with the bed overturned and the cab upright. The victim was ejected from the truck.

Two miners were killed in Falling Material accidents.

A 30-year old contract general foreman with 6 years of experience was killed at a copper ore operation. An excavator was being used to position a 36-inch diameter by

40-foot long section of pipe to connect it to another section of pipe. The pipe, attached to the excavator by a lifting strap, shifted and fell on the victim.

A 58-year old shaftman with 32 years of experience was seriously injured at an underground salt mine. The victim and two coworkers were replacing a bushing on the side of a skip hoist in the production shaft. The victim was standing on a steel beam outside the handrails of a covered work platform where the coworkers were standing, when a chunk of salt fell and struck him. He was transported to a hospital where he was pronounced dead.

One miner was killed in a Fall of Highwall accident.

A 49-year old assistant plant manager with 30 years of experience was injured at a crushed stone operation. The victim was working on a lift, taking samples from a highwall, when a large rock fell and struck him. He was hospitalized and died 12 days after the accident.

One miner was killed in a Machinery accident.

A 54-year old mechanic with 6 years of experience was killed at a lime operation. The victim went to a kiln pre-heat deck to repair a leaking hydraulic cylinder that activates a pusher arm on the kiln. He was caught between the corner of the angle iron and the plate connecting the push rods.

One miner was killed in an Explosives & Breaking Agents accident.

A 61-year old loader operator with 24 years of experience was killed at a crushed stone operation. The victim was in a front-end loader about 50 feet from the base of a highwall when a blast was initiated. Broken rock struck the front-end loader and covered it. The rock was removed from the front-end loader and the victim was recovered about 10 hours after the blast occurred.

Best Practices

Effective safety and health management programs save lives. Workplace examinations can identify and eliminate hazards that kill and injure miners. Effective and appropriate training helps ensure miners recognize and understand hazards and how to control or eliminate them.

While some of the specific circumstances of these accidents remain under investigation, here are some of the best practices that can prevent them:

Powered Haulage Accidents

These deaths can be prevented by following these Best Practices:

- Establish policies and procedures for conducting specific tasks on belt conveyors.

- Before beginning any work, ensure that persons are task trained and understand the hazards associated with the work to be performed.
- Do not perform work on a belt conveyor until the power is off, locked, and tagged, and machinery components are blocked against motion.
- Provide emergency stop mechanisms at the control panel(s) and at ground level where maintenance or repair work is performed.
- Provide appropriate controls to protect any person working near a stalled conveyor from unexpected motion.
- Maintain communications with all persons performing the task. Before starting belt conveyors, ensure that all persons are clear.
- Conduct adequate pre-operational checks and ensure that all braking systems on mobile equipment are functioning properly.
- Do not work or cross between rail cars unless the locomotive is stopped and the operator is notified and acknowledges your presence.
- Never place yourself between rail cars without blocking them to prevent movement.
- Maintain track-mounted equipment and tracks to prevent derailments.
- Provide berms, bumper blocks, safety hooks or similar impeding devices at locations where there is a hazard of overtravel or overturning.
- Always wear a seat belt when operating self-propelled mobile equipment.
- Do not operate mobile equipment with reported brake problems. Use other means to move the mobile equipment to a safe area for inspection and repair.
- Ensure that mobile equipment operators are task trained adequately in all phases of mobile equipment operation, including the mobile equipment's capabilities, operating ranges, load-limits and safety features, before operating mobile equipment.
- Maintain equipment steering and braking systems in good repair and adjustment. Always follow the manufacturer's service and maintenance schedules.
- Never rely on engine brakes and transmission retarders as substitutes for keeping brakes properly maintained.
- Conduct adequate pre-operational checks to ensure the service brakes will stop and hold the mobile equipment prior to operating.
- Operators of self-propelled mobile equipment shall maintain control of the equipment while it is in motion.
- Operating speeds shall be consistent with conditions of roadways, tracks, grades, clearance, visibility, curves, and traffic.
- Do not attempt to exit or jump from moving mobile equipment.

Falling Material Accidents

These deaths can be prevented by following these Best Practices:

- Before working on or near equipment, establish safe work procedures consistent with the design of the machine. Train all persons to recognize and understand these procedures.

- Task train all persons to recognize all potential hazardous conditions and to understand safe job procedures for elimination of the hazards, such as falling material before beginning work.
- Attach taglines to loads that may require steadying or guidance while suspended.
- Securely block equipment against hazardous motion to ensure energy cannot be released while performing work.
- Never work in the fall path of objects/materials of massive weights having the potential of becoming off-balanced while in a raised position.
- Implement measures to ensure persons are properly positioned and protected from hazards while performing a task.
- Monitor personnel routinely to determine that safe work procedures are followed.
- Examine the shaft and remove loose material prior to beginning work.
- Implement measures to ensure persons are properly positioned and protected from falling material while performing shaft maintenance work.
- Perform shaft maintenance work from a substantial platform with adequate overhead protection.
- Perform maintenance work for skip hoists and other conveyances on the surface whenever possible.
- Routinely monitor personnel to determine that safe work procedures are followed.

Fall of Highwall Accidents

These deaths can be prevented by following these Best Practices:

- Establish and discuss safe work procedures for working near highwalls. Identify and control all hazards.
- Train all persons to recognize adverse conditions and environmental factors that can decrease highwall stability and understand safe job procedures to eliminate all hazards before beginning work.
- Look, listen and evaluate pit and highwall conditions daily, especially after each rain, freeze, or thaw.
- Remove loose or overhanging material from the face. Correct hazardous conditions by working from a safe location.
- Ensure that work or travel areas and equipment are a safe distance from the toe of the highwall.

Machinery Accidents

These deaths can be prevented by following these Best Practices:

- Establish and discuss safe work procedures. Identify and control all hazards associated with the work to be performed along with the methods to properly protect persons.
- Always follow the equipment manufacturer's recommended maintenance procedures when conducting repairs to machinery.
- Task train all persons to recognize potential hazardous conditions and understand safe job procedures to eliminate all hazards before beginning work.

- Before working on or near equipment, ensure that the equipment power circuits are locked out/tagged out and that the equipment is blocked against hazardous motion.
- Require all persons to be positioned to prevent exposure to hazards. Monitor personnel to ensure safe work procedures, including lock out/ tag out and safe work positioning, are followed.
- Ensure guarding is in place to cover potential pinch points and moving parts in areas routinely accessed by personnel.

Explosives & Breaking Agents Accidents

These deaths can be prevented by following these Best Practices:

- Do not initiate a blast until it has been determined that all persons have been evacuated from the blast area.
- Establish and discuss safe work procedures. Identify and control all hazards associated with the work to be performed along with the methods to properly protect persons.
- Task train all persons to recognize all potential hazardous conditions, to ensure all persons have left the blast area, and to understand safe job procedures for elimination of the hazards before beginning work.
- Maintain and use all available methods of communication, such as sirens and radios, to warn persons of an impending blast. Establish methods to ensure that all persons are out of the blast area.
- Before firing a blast give ample warning to allow all persons to be evacuated.
- Guard or barricade all access routes to the blast area to prevent the passage of persons or vehicles.
- Verify that the blasting procedures are effective and being followed at all times.

Violations of the priority standards identified as **Rules to Live By** continue to be cited during investigations of mine fatalities. While not all of the fatality investigations have been completed and enforcement action taken, Rules to Live By standards continue to be identified in many of those fatalities. During inspections, MSHA's inspectors continue to discuss, with miners and supervisors, the root causes of these fatalities and the ways to prevent recurrences.

One **contractor** was killed at a mine in the first half of 2013. Contractors and mine operators should ensure that contractors are properly trained and following the mine's safety policies and procedures. Contractors and mine operators should coordinate operations at the mine to ensure that safety and health management programs are in place and are effective, all workplace examinations are performed, and safe work procedures are followed.

The importance and value of effective **safety and health management programs** helps send miners home safely at the end of their shifts. A thorough, systematic review of all tasks and equipment to identify hazards is the foundation of a well-designed safety and health management program. Many root causes of fatal accidents show that management policies, procedures, and controls were inadequate and failed to ensure

that persons were protected from hazards that could have been identified and then eliminated or controlled. Mine operators and contractors need to implement effective safety and health management programs and periodically review, evaluate, and update them. If an accident or near miss occurs, find out why and act to prevent a recurrence. If changes to equipment, materials, or work processes introduce new risks into the work environment, address them immediately.

Conducting **workplace examinations** every shift can prevent injuries and deaths when safety and health hazards are **found and fixed**. Miners are protected when workplace examinations are conducted and hazards are identified and eliminated.

Through June, 2013, 3 of the 9 (33%) miners killed had less than 3 years of mining experience. Providing effective and appropriate **training** to miners is a key element in ensuring their safety and health while at work. Mine operators and Part 46 and Part 48 trainers need to train miners and supervisors to take appropriate measures to find and eliminate the conditions that lead to injuries and deaths. Effective and appropriate training ensures that miners recognize hazards and understand how to control or eliminate them.

Take action to prevent additional injuries and deaths. Printable posters regarding the causes of some of these accidents can be found on the Alerts/Hazards section of MSHA's website, www.msha.gov. Fatalgrams describing each fatality and Best Practices to prevent a recurrence can also be found on the agency's website.

Miners deserve a safe and healthy workplace and the right to go home safe and healthy at the end of every shift, every day. Working together makes that happen.