

## **Summary of 2011 Fatal Accidents through June 30 at Metal/Nonmetal Mines with Preventative Recommendations**

Six miners in the metal and nonmetal mining industry have been killed as a result of mining accidents in the first six months of 2011.

Two miners died as a result of **Fall of Roof** accidents. One miner was killed when he was struck by **Sliding Material**, and one miner died in a **Machinery** accident. One miner lost his life due to a **Powered Haulage** accident and another miner was killed in a **Fall of Person** accident. Two (33%) of the six fatalities were **contractors**.

Here is a brief summary of these accidents:

### **Two miners were killed in Fall of Roof accidents.**

A miner was killed at an underground silver operation. He was wetting a muck pile in a stope when a fall of back approximately 90 feet long struck him.

A drill operator was killed at an underground crushed stone operation. He was walking in a crosscut when a slab of roof approximately 5 feet wide by 6 feet long by 10 inches thick struck him.

### **One miner was killed in a Sliding Material accident.**

A contract superintendent was killed at a phosphate rock operation. The victim was attempting to join two ends of 24-inch diameter pipe. Two excavators were being used to position the pipe in the saddle of a pipe fusing machine when the pipe slipped out and struck him.

### **One miner was killed in a Machinery accident.**

A contract grader operator was killed at a phosphate rock operation. The victim and a coworker were standing and talking when he was struck by a grader that was backing up. The accident occurred in a staging area where equipment operators were inspecting their equipment before the shift.

### **One miner was killed in a Powered Haulage accident.**

An equipment operator was killed at a sand and gravel operation. He was cleaning a tramp metal magnet on a belt conveyor when it started.

### **One miner was killed in a Fall accident.**

A mill operator was killed at a surface gold operation. The victim was sweeping in a crusher building when he fell through an opening approximately 60 feet to the floor below. The cover for the opening was not secured in place.

## **Mining Deaths from 2001 to June 30, 2011 -- Best Practices**

Preventable deaths continue to occur in metal and nonmetal mining. Between 2001 and June 30, 2011, there have been 93 powered haulage fatalities; 62 miners killed working around, under, or inside machinery; 35 miners died from falls; 31 fatalities from falling/sliding material; 18 fatalities from roof or rib rolls; and 18 fatalities from electrical accidents. During the same period, 82 fatalities occurred in other categories.

Fatalities can be prevented. They are not inevitable in mining. Effective safety and health management programs save lives. Workplace examinations for hazards can identify and eliminate hazards that kill and injure miners. Effective and appropriate training will help ensure that miners recognize and understand hazards and know how to control or eliminate them.

### **Powered Haulage Accidents**

**These deaths can be prevented by following these Best Practices:**

- Maintain control of mobile equipment while in motion
- Maintain operating speeds consistent with conditions of roadways, grades, clearance, visibility, traffic, and the type of equipment used
- Place controls in the Park position and set the parking brake when mobile equipment is left unattended
- When parked on a grade, chock the wheels of mobile equipment or turn them into a bank
- Barricade or post warning signs at all approaches to areas where health or safety hazards exist that are not immediately obvious
- Inspect and maintain powered haulage equipment for operational reliability
- Assure backup alarms and horns function
- Sound alarms and horns before starting or moving equipment
- Stay clear of mobile equipment
- Lock Out and Tag Out equipment before performing maintenance
- Communicate miners' locations
- Assess risk where miners work in confined spaces
- Avoid pinch points when working around mobile equipment
- Install proximity detection/protection systems

### **Falling/Sliding Material**

**These deaths can be prevented by following these Best Practices:**

- Stay clear of suspended loads
- Stay clear of persons working above
- Stay out of the line of fire
- Conduct a risk analysis before beginning work
- Inspect and maintain buildings for structural integrity
- Inspect and maintain equipment for operational reliability
- Routinely examine metal structures for indications of weakened structural components (corrosion, fatigue cracks, bent/buckling beams, braces or columns, damaged/loose/missing connectors, broken welds, etc.)

### **Machinery Accidents**

**These deaths can be prevented by following these Best Practices:**

- Conduct a risk analysis before beginning work
- Lock Out and Tag Out equipment before performing maintenance
- Block equipment in the raised position before working on or under it
- Secure raised equipment to prevent accidental lowering or rolling
- Stay clear of suspended loads
- Pre-plan work in confined spaces
- Never place one's body or limbs between powered or moving equipment and stationary objects when the equipment is operating

**Roof Falls, Rib Rolls and other Ground Control Issues**

**These deaths can be prevented by following these Best Practices:**

- Perform thorough ground examination
- Perform examinations after blasting and whenever conditions change
- Scale only from a safe location
- Never work or travel under unsupported roof
- Stay clear of the tops and toes of highwalls and stockpiles
- Use ground support where ground conditions or mining experience in similar ground conditions in the mine indicate it is necessary
- Design, install and maintain ground systems to control the ground in places where persons work or travel

**Fall of Person**

**These deaths can be prevented by following these Best Practices:**

- Use fall protection when working where a fall hazard exists
- Position ladders to ensure stability and eliminate trip
- Face the ladder when climbing or working from a ladder
- Do not lean while standing on a ladder
- Maintain three points of contact when climbing a ladder

Failure to **Lock Out and Tag Out (LOTO)** the source of power for equipment continues to result in mine fatalities. During the last decade, 41 miners died in accidents that could have been prevented by ensuring that all electrical components are de-energized and that miners place **THEIR** lock and tag on the disconnecting device. So far in 2011, one such fatality occurred involving a powered haulage conveyor accident. This would not have occurred if the power been de-energized and the disconnecting locked and tagged out.

Violations of the priority standards identified as **Rules to Live By** continue to play key roles in mine fatalities. While not all of the fatality investigations have been completed and enforcement action taken, **Rules to Live By** standards continue to surface in a number of those fatalities. MSHA's inspectors continue to discuss the root causes of these fatalities and the ways to prevent recurrences with miners and supervisors.

The importance and value of effective **Safety and Health Management Programs** is paramount to sending 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 mines operate every shift of every day, year in and year out, without a fatality or a lost-time injury. 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 does occur, find out why and act to prevent a recurrence. If changes to equipment, materials or work processes introduce new risks into the mine environment, address them immediately.

Conducting **Workplace Examinations** every shift can prevent deaths when safety and health hazards are **found and fixed**. Miners are protected when workplace examinations are performed, problems are identified, and hazards are eliminated.

## Training

From January 1 through June 30, 2011, 2 of the 6 (33%) miners killed had one year or less at the mine site and 1 of these miners (17%) had less than one year of mining experience. Additionally, 2 of those 6 miners (33%) had less than one year of experience at that job or task. Providing effective and appropriate training to miners is a key element in ensuring their safety and health. Mine operators and Part 46 and Part 48 trainers need to train miners and mine supervisors to take appropriate measures to eliminate the conditions that lead to deaths and injuries.

Action must be taken to prevent additional deaths. When the investigations are completed, a detailed investigation report on each fatality can be found on the MSHA website at <http://www.msha.gov/fatals/fab.htm>.

## Non-Fatal and Near Miss Accidents

Serious non-fatal and near miss accidents continue to occur at metal/nonmetal mines. Any of these accidents could have resulted in death to a miner. Train all supervisors and miners to be alert for hazards and eliminate them when any are found. The following are examples of near misses:

On February 15, 2011, the operator of a dragline completed digging and started moving the dragline to the next location. The dragline was sitting on shot material, with the tracks at the water's edge. The machine started rolling forward to the water's edge and the operator felt the machine going into the water. He jumped from the machine and he was able to climb back to the bank.

On February 23, 2011, a miner was injured when he jumped from the cab of a truck mounted crane. He was lifting a crusher when the main shaft slipped and fell through the cab window of the crane. The miner jumped from the cab to avoid the falling shaft.

On March 13, 2011, an off the road mine truck that had been converted to a water truck, rolled over, pinning the operator inside. The victim was descending a ramp and gained

speed up to approximately 30 miles per hour when he went around a turn and overturned the truck. This was the victim's first time operating this truck. He was **wearing his seat belt** and was suspended upside down in the cab of the truck until the emergency personnel were able to cut the cab of the truck open and release him from his seat belt. The victim was transported by helicopter to the hospital for observation.

On April 5, 2011, a truck driver backed his haul truck to the bermed edge of a ramp that was under construction. While dumping, the ground failed and the truck slid 38 feet down the ramp and tipped with the driver's side up. The 70-year old truck driver was **wearing his seat belt** and received only minor injuries.

On May 19, 2011, five persons were seriously burned in an accident at a cement plant. Three of the injured were life-flighted to a local hospital and the others were transported by ambulance. A power outage suddenly occurred and management decided to make repairs at the discharge, inside end of the clinker cooler which cools a bed of clinker that is in excess of 2000°F when it enters the cooler. After working for about 50 minutes, the crew exited the vessel through a 33-inch square access door. At that time, about 24 cubic yards of hot, fine material that had built-up in a duct suddenly fell out into the cooler, burning the victims. Fine material build-up on the inside walls of a clinker cooler or in the ducts leaving it is a common occurrence and a well-known hazard in a cement plant. The plant had a safe work procedure (check list) that was to be used before persons entered the cooler which was not used this time.

On June 22, 2011, an unplanned inundation of anhydrous ammonia occurred at a new mercury recovery system that was being commissioned next to the autoclave. Eleven construction contractor workers and two mine employees were affected. The contractors were insulating in the area where the release took place.

On June 21, 2011, the grizzly bars on the feed to a conveyor bridged over with material. The victim removed the material and jogged the conveyor to get the material on the belt to the edge of the mill feed. He then called the control room leader to start the mill and conveyor. The victim was found leaning against the head pulley structure with an amputated arm. He was airlifted to a hospital where he underwent emergency surgery.

On June 17, 2011, the driver of a water truck was backing his unit down a long ramp on a mine road. The engine died and he attempted to stop the truck using the brakes, which did not work properly. In an effort to avoid colliding with other traffic, the truck driver used the highwall to slow the truck down. The truck hit the toe and tipped over on the driver's side. The truck driver truck was **wearing his safety belt** and although he was suspended until rescued, he did not sustain any injuries.

Printable posters addressing the common causes of these accidents can be found on the Alerts/Hazards section of MSHA's website, [www.msha.gov](http://www.msha.gov).

All miners deserve a safe and healthy workplace and the right to go home safely at the end of every shift, every day.