

Mid-Year Summary of 2012 Fatal Accidents at Coal Mines and Preventative Recommendations

During the first six months of 2012, ten miners were killed in accidents in the coal mining industry.

One miner was killed in each of the following accident classifications: Exploding Vessels Under Pressure, Other (Drowning), Handling Materials, Machinery, and Electrical. Three died from Slip or Fall accidents, and two from Rib Fall accidents. Five of these fatalities occurred on five consecutive weekends, and three of the fatalities involved supervisors. This is a particular warning flag for the mining industry.

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

Here are brief summaries of these accidents:

Exploding Vessels Under Pressure

A 44-year-old utility/diesel tram operator with 1 year and 8 months mining experience, died from injuries he received when repairing a damaged water outlet (fire valve manifold). During the repair work, 1.5 inch bronze ball valve (quarter turn valve) failed catastrophically, propelling the steel manifold into the miner's face/head. This fire valve manifold was originally damaged when an oversized load being transported on the adjacent mine track haulage system contacted the outlet, causing it to separate from the 6" mine water supply. The failure resulted from the internal threaded body of the valve separating from the external threaded portion of the valve.

Drowning

A 52-year-old deckhand with 4 years of mining experience was determined missing drowned when measuring the distance from the water surface to the bottom of a set of empty barges that were to be loaded. He had to cross from the dock to the first empty barge. He apparently fell from the barge into the water. The miner was wearing a flotation device, but the flotation device was not designed to keep an unconscious miner's face above water.

Handling Materials

A 32-year old foreman was killed while attempting to install a canopy on a Joy 21 SC Shuttle Car. The canopy was suspended from the mine roof by a cable and chain. The foreman was seated in the operator's compartment of the shuttle car beneath the suspended canopy. The canopy shifted and fell, striking the foreman in the head, causing fatal injuries. The victim had 11 years of mining experience, 2 years and 6 weeks experience at this mine, and 32 weeks of experience as a foreman.

Rib Fall

A 34-year-old section foreman with 11 years of experience was killed while operating a continuous mining machine in the No. 2 entry. He was struck by a section of rock that

fell from the right-hand rib. The rock was approximately 10 feet and 6 inches long, 3 feet and 4 inches high, and 10 inches thick.

Machinery

A 55-year-old surface foreman with 19 years of mining experience was killed when he was caught between the frame of a highwall miner transportation dolly and a front-end loader with a forklift attachment.

Electrical

A 37-year old electrician, with approximately 3½ years experience (approximately 1½ years as an electrician), was killed when he contacted the energized conductors of a shuttle car trailing cable. He was making the final electrical connections for a replacement cable reel when he was electrocuted.

Slip or Fall

A 61-year-old demolition contractor with approximately 20 years of experience was killed from injuries received while dismantling a conveyor stacker belt from the surface area of an inactive underground coal mine. The victim had completed the final torch cut on an elevated, inclined stacker frame support beam containing the counter-weight, when the structure fell. The structure contacted the walkway (catwalk) where the victim was located. This section of the walkway, approximately 25 feet long, broke loose from the main structure, causing the victim to fall approximately 27 feet.

Slip or Fall

On Thursday, May 17, 2012, at approximately 12:00 p.m., a 57-year-old mechanic was killed at a coal preparation plant. The victim was standing on a 14-foot fiberglass extension ladder when it became unstable and slid across an I-beam. He fell down an adjacent hoist well opening 39 feet to the concrete floor below. He was attempting to cut and remove a 12-inch hoist beam located above the third floor in the plant.

Slip or Fall

A 43-year-old shaft worker with 39 weeks of mining experience died from injuries he received when helping pour concrete in a 30-foot diameter shaft that was under construction. The victim and his coworkers were using a hose to direct concrete into forms that lined the shaft wall. The hose was overloaded as concrete came out of the hopper too fast, which caused the hose to surge. This sudden movement of the hose knocked the victim and his coworkers off their feet, resulting in a fracture to the left leg of the victim. The victim was treated at a local hospital and released. He passed away at his residence as a result of complications of this injury.

Rib Fall

A 33-year-old outby foreman with 7 years of experience was killed while installing additional rib/roof support in the No. 5 belt/track entry. The victim was wedging a timber against the mine roof to support the rib when a section of the left hand rib rolled on top of him. The rock was approximately 14 feet long, 4 feet high, and 17 inches thick.

Miners do not need to die while working at coal mining operations. These fatalities can be prevented. No miner should die while working. Effective safety and health management programs save lives. Workplace examinations can identify and eliminate hazards that kill and injure miners. Effective and appropriate training will help ensure that miners recognize and understand hazards and how to control or eliminate them.

Best Practices

While some of the specific circumstances of these accidents remain under investigation, here are best practices that we can identify at this time to prevent accidents like these in the future:

Exploding Vessels Under Pressure

- When performing work on pressurized water supply piping systems, STOP ALL water flow into the pipe being worked on; BLEED ALL residual pressure from the pipeline, and when possible, OPEN A VALVE at an alternate location to ensure constant pressure relief. LOCK OUT and TAG OUT these valves to ensure safety while repairs are made.
- NEVER REUSE components in a pressurized line that may have been damaged or compromised.
- Ensure that components, such as valves, couplings etc. used in a pressurized water system are compatible with the highest measured or expected STATIC pressure in the system.
- Implement a Standard Operating Procedure for the design, installation, testing, and maintenance of pressurized fluid systems that is consistent with National Fire Protection Association standards.
- Install slow closing indicating valves. When opening a valve to put water flow into a pressurized system, do it slowly and minimize exposure to pressurized components. See slow closing indicating valves on MSHA's Belt Fire Suppression Simulator at the National Mine Health and Safety Academy. <http://www.msha.gov/alerts/SafetyFlyers/ScoreaTDMineFire2009.pdf>
- Inspect, examine, and evaluate all materials used during installation, replacement, or repair of pressurized water systems to ensure suitability.
- Properly train all miners on the hazards associated with working on or around pressurized fluid piping systems.
- Maintain safe and adequate clearance to prevent mobile equipment and machinery from contacting pressurized lines, valves, etc.
- Install barriers to prevent equipment from damaging piping and valves.
- Ensure adequate supervision when moving oversized equipment in haulage entries

Drowning

- Use electronic devices to determine the draft in barges.
- Install and use lifeline tie-off systems to provide fall protection over water.
- Use and maintain sufficient area lighting and personal lighting.

- Set up a look out and communications protocol. Do not work alone.
- Ensure safe access is provided where persons are required to work or travel. Watch footing and stay clear of ropes, cables, and other obstacles. Use de-icing material to clear ice from walkways. Maintain three points of contact where practicable.
- Wear properly fitted personal flotation devices that are designed to keep an unconscious miner's face above water.
- Utilize wearable electronic emergency warning systems to immediately notify others of a fall into water. These devices can be equipped with water activated strobe lights and global positioning system tracking.

Handling Materials

- Consider all hazards and implement formal procedures that address possible hazards before performing a materials handling job.
- Devise safe methods to complete tasks involving large objects, massive weights, or the release of stored energy.
- Always de-energize equipment and block against motion.
- Never use permanent roof support as a mechanism for lifting heavy objects. Install lifting points that are designed and manufactured to support the intended load.
- Use only devices designed and rated for the suspension of heavy loads and do not exceed the rated capacity of hoisting, towing, or rigging tools.
- Use a positive means to prevent objects/materials from falling, or moving when working with or near extremely heavy objects/materials suspended overhead.
- Never work in the fall path of objects/materials or massive weights that can become off-balance while suspended.
- Train personnel to recognize hazardous work procedures, including working in pinch points where inadvertent movement could cause injury.

Rib Fall

- Conduct thorough pre-shift and on-shift examinations of the roof, face, and ribs. A thorough exam must be conducted before any work or travel is started in an area and thereafter as conditions warrant.
- Support any loose roof or rib material adequately or scale loose material before working or traveling in an area.
- Danger-off areas where hazardous roof or rib conditions are detected until they are made safe.
- Install rib bolts on cycle and in a consistent pattern to provide the best protection from rib falls.
- Ensure that the Approved Roof Control Plan is followed and is suitable for the geologic conditions encountered. If adverse conditions are encountered, the plan must be revised to provide adequate support for the control of the roof, face, and ribs.

Machinery

- Never position yourself between equipment in motion and a stationary object. Always be aware of your location in relation to machine parts that have the ability to move.
- Ensure mobile equipment operators are aware of miners' locations at all times.
- Maintain communication with mobile equipment operators when working in confined areas. Ensure that line of sight, background noise, or other conditions do not interfere with communication.
- Ensure miners are adequately trained for the task they are performing.
- Use a tow bar with adequate length and proper rating when towing heavy equipment.
- Wear brightly-colored clothing or clothing that is distinguishable from surroundings to become more visible.

Electrical

- Develop a hazard analysis work plan before conducting repairs.
- Always lock and tag-out electrical equipment prior to electrical work.
- Perform your own lock and tag-out procedure. Never rely on others to de-energize or disconnect a circuit for you.
- Use proper Personal Protective Equipment (PPE) for all electrical work.
- Ensure that all electrical circuits and circuit breakers are identified properly before troubleshooting or performing electrical work.
- Use properly rated non-contact voltage testers to ensure that circuits are de-energized.
- Eliminate personal distractions when working on equipment.
- For more information related to Lock and Tag safety, click on the following link on the MSHA Web site: [Lock and Tag Safety](#)

Slip and Fall

- Clear the area of tripping and stumbling hazards before starting any work.
- Secure structures against unexpected movement when performing demolition work.
- Use fall protection when working in an elevated position and securely tie-off where the danger of falling exists.
- Ensure all workers are adequately trained in the use of fall protection and restraint devices.
- Examine fall protection equipment and personal protective equipment before each use. Ensure that defective equipment is replaced.
- Properly position ladders to ensure that footing is secure, that the ladder is resting in a manner that prevents movement, and that the ladder is protected from being struck by moving objects.
- Provide a means to control water, air, concrete, etc., lines when they are pressurized to prevent surges and other unintended movement.

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, not all of the violations have been identified, and not all of the associated citations and orders have been issued, it currently appears that violations of the Rules to Live By standards were still involved in several of those fatalities. MSHA's inspectors will be especially mindful of these issues while performing inspections. They will be talking to miners and mine supervisors in mines throughout the country to discuss these kinds of fatalities, and the ways to prevent them.

Contractors

No contractors were killed at coal mining operations in the first quarter of 2012. Two contractors were killed in the second quarter of 2012. Contractors and mine operators should ensure that contractor employees are properly trained and follow 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** cannot be overstated. A thorough, systematic review of all tasks and equipment to identify hazards is the foundation of a well-designed safety and health management program. Modify equipment, processes, work procedures and management systems to eliminate or control identified hazards. Operators and contractors should create effective safety and health management programs, ensure that they are implemented, and periodically review, evaluate, and update them.

If an accident or "near miss" occurs, determine the root cause(s) and act to prevent a recurrence. If changes to equipment, materials, or work processes introduces new risks into the mine environment, they must be addressed immediately.

Conducting **workplace examinations** before and during each shift can prevent deaths by finding and fixing hazards. All required workplace examinations must be performed, and identified hazards eliminated to protect miners.

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 all miners to recognize the conditions that lead to deaths or injuries and ensure that measures are taken and followed to eliminate hazardous conditions. Training all miners to follow safe work procedures and stay focused on the task they are performing cannot be stressed enough.

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, we can make that happen.