Summary of 2011 Fatal Accidents at Coal Mines with Preventative Recommendations

Twenty-one miners in the coal mining industry were killed as a result of mining accidents from January 1 to December 31, 2011.

Eight miners were killed as a result of **Machinery** accidents. Four miners were killed in **Powered Haulage** accidents. Three fatalities occurred in a **Face/Rib/Highwall Fall** accidents. Three miners are dead as a result of **Fall of Rib, Roof, Face or Back** accidents. One miner was killed in a **Fall of Person** accident. One miner was killed in **Electrical** accident. One miner was killed in **Falling/Sliding Materials** accident. Five (23%) of the fatalities were **contractors**.

Here is a brief summary of these accidents:

Eight miners were killed in Machinery accidents

On February 11, 2011, a 55-year-old miner with 30 years of mining experience was killed when the fuel and grease service truck he was operating collided head on with a scraper. The two pieces of equipment were traveling in opposite directions. The impact resulted in a fire that engulfed the fuel truck.

On March 25, 2011, a 54-year-old continuous mining machine operator with 35 years of experience was killed when he was caught between the coal rib and the conveyor boom of the remote controlled continuous mining machine he was operating.

On May 14, 2011, a 37-year-old mechanic with 14 years of mining experience and 1½ years of experience as a mechanic was killed while removing a counter weight fuel tank assembly from a front-end loader. He was positioned beneath the front-end loader when he removed 14 of the 16 mounting bolts that secure the counter weight. When the victim attempted to remove the next to last bolt, the remaining two bolts failed allowing the 11,685 pound counterweight, which had not been blocked, to fall on him.

On August 8, 2011, a 41-year-old longwall mechanic with nine years of mining experience was killed when he was struck in the chest by a piece of metal from the top of a base lift jack mounted on a longwall shield. The catastrophic failure of the jack caused the end cap to separate from the cylinder and strike the victim.

On September 1, 2011, a 29-year-old contract driller with 1 year, 3 months of experience was killed at a surface coal mine when he was struck by a tong wrench while attempting to separate a pipe connection in a rig being used to drill a water well. The crew was working to free the drill stem that was stuck in the drill hole when the accident occurred.

On October 17, 2011, a 62-year-old miner with 30 years of mining experience was killed when he was struck by a track-mounted back hoe on the surface of an underground mine. He was using a jumper cable to move the back hoe at a gap in the trolley wire

when it was reenergized by the jumper cable and struck and ran over him. He had one day of experience operating this machine.

On November 2, 2011, a 28-year-old bulldozer operator, with approximately 8 years of mining experience, was injured at a surface mine while he was conducting reclamation work on top of a graded slope. He lost control of the bulldozer and it rolled over several times approximately 250 feet to the bottom of the slope. Although he was wearing a seat belt, he sustained serious injuries that resulted in his death on November 14, 2011.

On December 3, 2011, a bulldozer operator with 18 years of mining experience was seriously injured when the bulldozer he was operating traveled over a highwall and fell approximately 90 feet to the pit below. The victim was in the process of clearing topsoil from the bench in preparation for the next blast. He was not wearing a seatbelt and was ejected from the bulldozer. He died on December 6, 2011, from the injuries sustained in this accident.

Four miners were killed in Powered Haulage accidents

On January 27, 2011, a 19-year-old underground miner with fifteen weeks of mining experience was killed when he became caught between the "V" shaped coal discharge guides adjacent to the discharge roller of the section conveyor belt. Both belt conveyors were operating at the time of the accident.

On July 11, 2011, a 26-year-old supply motor operator with 6 years 1 month of mining experience was killed while transporting materials using a diesel powered 15-ton locomotive. When the locomotive approached a low, steel, over-cast beam, the victim placed his head outside of the operator's compartment and was struck by the steel beam and the locomotive's canopy.

On July 21, 2011, an office worker was killed at a surface coal operation when she was struck by a pickup driven by a vendor who was assessing the mine for routine maintenance. As part of a wellness program instituted at the mine, the victim was walking along a rural road on the permit area for the mine when the pickup struck her from behind.

On November 7, 2011, a 47-year-old mine foreman with approximately 26 years of mining experience was killed when he was pinned between a battery-powered, rubber-tire personnel carrier and a coal rib. The personnel carrier had become stuck in reverse and the victim was positioned on his knees in front of the personnel carrier. When the operator placed the directional switch in forward, the personnel carrier traveled forward, striking the victim. A wooden crib block had fallen onto the control pedals and restricted their use.

Three miners were killed in Face/Rib/Highwall Fall accidents

On October 28, 2011, a 47-year-old blaster with 2 years of experience and a 23-year-old blaster helper with 13 weeks of experience received fatal injuries when a portion of

the highwall in the west end of the number 11 pit failed, covering the truck and the two miners.

On December 7, 2011, a 49-year-old excavator operator with 20 years of mining experience was fatally injured when a highwall he was working near collapsed. The excavator was being used to load rock trucks. The operator's cab was positioned on the highwall side when the accident occurred.

Three miners were killed in Fall of Rib, Roof or Back accidents

On June 27, 2011, a crew leader received fatal crushing injuries from a coal and rock brow that fell from the top of the rib while he was cleaning the mine floor to install timbers outby the active section.

On June 29, 2011, a 49-year-old continuous haulage cable attendant was killed when he was struck by a section of rib approximately 82 inches long, 36 inches wide, and 11 inches thick.

On August 15, 2011, a 46-year-old miner was killed when he was struck by a portion of the mine roof that fell from an area adjacent to a longwall shield while the victim was installing a wooden crib in an area where a longwall face shield had been removed during a longwall move. The victim had approximately 5 years experience with this activity.

One miner was killed in a Fall of Person accident

On June 9, 2011, a 53-year-old contract steelworker with more than 16 years of coal mining experience was killed when he fell approximately 8 feet from a steel beam and hit a lower cross beam before landing on a conveyor belt cover located about 32 inches below the cross beam. The victim had been engaged in cutting operations just prior to the fall, and was repositioning when he removed his lanyard tie-off safety device from the location where it was secured.

One miner was killed in an Electrical accident
On July 27, 2011, a 39-year-old miner with 22 years of mining experience was electrocuted when he contacted an energized welding electrode while welding to connect two pipes. He was working in the ceiling of the filter room of a preparation plant which was wet and poorly lit.

One miner was killed in a Falling/Sliding Materials accident
On October 7, 2011, a 23-year-old section repairman with five years of mining experience was killed when a continuous haulage conveyor which he was attempting to repair fell on him. A rock had been used to block up the continuous haulage conveyor.

MINING FATALITY BEST PRACTICES

Powered Haulage Accidents
These deaths can be prevented by following these well known best practices:

- Maintain safety devices such as brakes in proper operating condition.
- Do not overload haulage equipment.
- Properly construct and maintain berms.
- Perform adequate pre-operational checks. Record and report defects that affect safety.
- Implement necessary traffic rules and install necessary signs.
- Maintain operating speeds consistent with conditions of roadways, grades, clearance, visibility, traffic, and the type of equipment used.
- Sound alarms and horns before starting or moving equipment.
- Communicate your location to operators of mobile equipment.
- Train all employees thoroughly on the dangers of working or traveling around moving conveyor belts.
- Install proper belt cross-overs and/or cross-unders at strategic locations, when height allows.
- Be aware of locations where new miners are working or intend to travel.
- Install adequate guarding at all conveyor belt pinch point locations

Machinery Accidents
These deaths can be prevented by following these well known best practices:

- AVOID "RED ZONES!" Prior to tramming the continuous mining machine to a new place, ensure the machine operator is positioned outside the turning radius of the machine. http://www.msha.gov/webcasts/coal2004/REDZONE2.pdf
- Install MSHA-approved Proximity Detection Systems on continuous mining machines. http://www.msha.gov/Accident_Prevention/NewTechnologies/ProximityDetection/ProximitydetectionSingleSource.asp
- Inform others when driving a vehicle into a work area.
- Obey established traffic rules and signage that apply to the area.
- Follow established communication procedures.
- Maintain control of equipment at all times.

- Ensure all safety systems are maintained, including brakes and steering.
- Follow the equipment manufacturers recommended maintenance procedures when performing repairs to machinery.
- Train new mechanics in the health and safety aspects and safe work procedures related to their assigned tasks.
- Conduct a risk analysis before beginning work.
- Lock Out and Tag Out Equipment, and/or block against motion before performing maintenance.
- Assure all tram control switches are in the off position and the brake is set before applying a DC power jumper to the machine.
- Always attach a nip on the machine first, then attach the nip on trolley wire, while standing in a safe location.
- Ensure adequate task training is provided to equipment operators which cover all machine controls, functions and hazards related to the machine operation and any safe operating procedures related to the specific equipment operation.
- Use self-centering tram/power controls to limit unexpected machine movement.

Fall of Highwall accidents

These deaths can be prevented by following these well known best practices:

- Train all miners to recognize hazardous highwall conditions.
- Look, Listen and Evaluate your highwall and pit conditions daily, especially after each rain, freeze, or thaw.
- Examine highwalls from as many perspectives as possible (bottom, sides, and top/crest) while maintaining the safety of the examiner(s). Look for signs of cracking or other geologic discontinuities.
- Be your own examiner and find hazards before they find you.
- Maintain adequate lighting to aid in examinations of highwalls and pit during no light or low light situations.
- Observe and communicate highwall hazards immediately.
- Insure appropriate action is taken to remove the hazards associated with any anomaly that may appear in the highwall or pit.
- Ensure that personnel's work or travel areas and mining systems or equipment are operating are a safe distance from the toe of the highwall.
- Follow safe job procedures.
- Operate excavators with the cab perpendicular to, and away from, the highwall. Design benches to safely accommodate the type of equipment used and include this in the Ground Control Plan.
- Use auxiliary lighting during non-daylight hours to conduct highwall examinations and to illuminate active work areas.
- Perform supplemental examinations of highwalls, banks, benches, and sloping terrain in the working area during inclement weather.

- Immediately remove all personnel exposed to hazardous ground conditions, barricade, and/or post signs to prevent entry, and promptly correct the unsafe conditions.
- Brief foremen and miners coming to work on any uncorrected hazardous conditions, and ensure the hazardous conditions are noted in the on-shift examination record book.

Rib Rolls

These deaths can be prevented by following these well known best practices:

- Perform thorough pre-shift and onshift examinations.
- Know and follow the rib control provisions contained in the approved roof control plan.
- Use and properly maintain equipment that can install rib control devices
- Install supplemental rib supports when needed.
- Scale ribs only from a safe location.
- Use mining methods that will not expose persons to rib failure hazards.
- Use prudent engineering principles to design mines properly so that rib hazards are mitigated to the largest degree possible.

Fall of Person

These deaths can be prevented by following these well known best practices:

- Position ladders to ensure stability and eliminate trip hazards.
- Wear and use fall protection, maintaining 100 per cent tie off, when fall hazards exist. See http://www.msha.gov/Accident_Prevention/innovativeproducts/2009/TieOff.asp
- Ensure workers are trained and understand the proper use of restraint devices.
- Provide self retracting lanyard mechanisms when possible.
- Ensure secure footing in all work areas.
- Examine tools and personal protective equipment routinely and replace when defects or wear is evident.
- Conduct a risk assessment of the work area prior to beginning any task and identify all possible hazards. Use the SLAM; Stop, Look, Analyze, and Manage approach for work place safety.

Electrical

These deaths can be prevented by following these well known best practices:

- Do not touch an energized electrode with bare skin. Avoid wet working conditions. Perspiration can lower the body's resistance to electrical shock. Do not drape electrode wires or leads over your body. Work in a confined space only if it is well ventilated and illuminated.
- Do not use the plant structure as the work (return) conductor. Connect the work cable (return) as close to the welding area as practical to prevent welding current from traveling unknown paths and causing possible shock, spark, and fire hazards.

- Insulate yourself from work and ground by using and/or wearing dry insulating mats, covers, clothes, footwear, and gloves. Inspect welding gloves for damage prior to welding and ensure the gloves are dry.
- Use only well maintained equipment. Frequently inspect welding wires or leads for damaged or exposed conductors. Replace or repair wires or leads immediately if damaged.
- Use voltage reduction safety devices (if available) for arc welders.

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 majority 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 others like them.

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 root causes of fatal accidents show that management's policies, procedures, and controls were inadequate and failed to ensure that persons were protected from hazards that could have been identified, eliminated, or controlled. 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 December 31, 2011, 11 of the 21 (52%) miners killed had one year or less experience at the activity they were performing when they were killed. Additionally, 8 of those 21 miners (38%) had less than one year of experience at the mine. In 2011, five contractors (23%) were killed in coal mining accidents. Providing effective and appropriate training to miners is a key element in ensuring their safety and health. Mine operators, contractors, 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 .