OAIMA Spring Thaw

Metal and Nonmetal
Fatality Reduction Initiative

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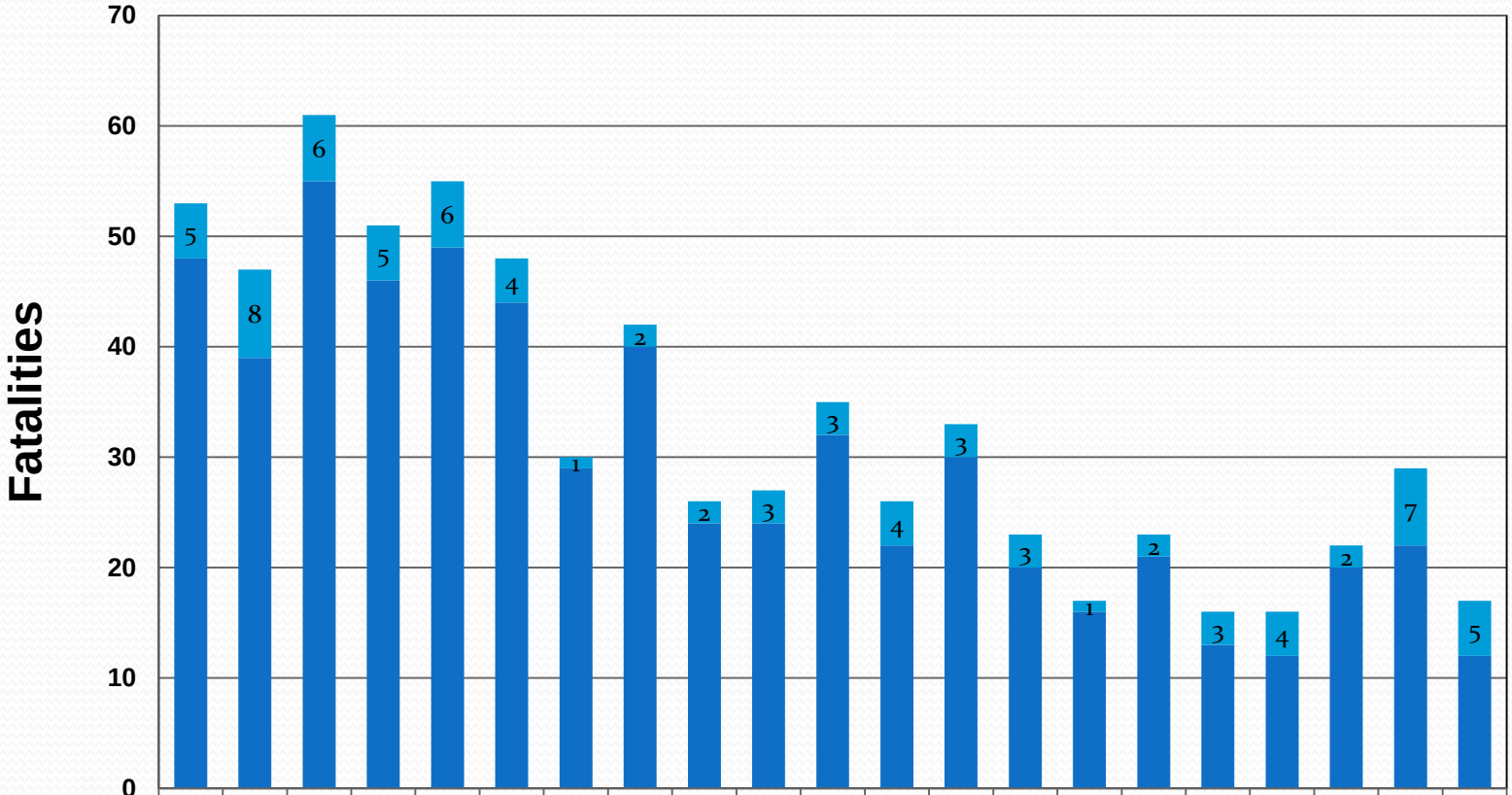
Metal and Nonmetal Mining Industry



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Notheastern	5	8	6	5	6	4	1	2	2	3	3	4	3	3	1	2	3	4	2	7	5
Nation	48	39	55	46	49	44	29	40	24	24	32	22	30	20	16	21	13	12	20	22	12

Northeastern District Fatal Accidents (1995 – 2015)

Year	Mine Employee		Contractor	
	Supv	Hourly	Supv	Hourly
1995	0	2	0	3
1996	0	5	1	2
1997	1	4	0	1
1998	0	4	1	0
1999	1	4	1	0
2000	0	2	0	2
2001	0	0	0	1
2002	0	1	0	1
2003	1	1	0	0
2004	2	0	0	1
2005	0	3	0	0
2006	1	1	1	1
2007	1	2	0	0
2008	1	1	0	1
2009	1	0	0	0
2010	0	1	0	1
2011	0	3	0	0
2012	1	2	0	1
2013	0	2	0	0
2014	2	3	0	2
2015	2	2	0	1
Totals	14	43	4	18
	57		22	

- 72% of the Fatalities involved **Mine Employees** (57 of 79)
  - 25% of these accidents involved **Supervisors** (14 of 57)
- 28% of the Fatalities involved **Contractors** (22 of 79)
  - 18% of these accidents involved **Supervisors** (4 of 18)
- 23% of all Fatalities in the Northeastern District involved **supervisory personnel** (18 of 79).

Metal and Nonmetal Near Miss and Serious Accident Review

January 1 – Most Current Information

http://www.msha.gov

METAL / NONMETAL
Serious Injury Accident

Cement Plant – A contract employee (victim) was using a hand held rotary saw with a worn concrete blade to cut through a 6-inch iron pipe. As the victim attempted to cut the pipe from the bottom up, the saw bounced off the pipe striking the victim in the chest causing a severe wound. Victim was transported to a local hospital and was released several days later.

Best Practices

- Use appropriate equipment for the job.
- Train workers on machine use and allow only trained workers to operate and maintain the equipment.
- Frequently inspect equipment and guards.
- Do not use worn blades due to the potential to cause kickbacks.
- Follow manufacturer's specifications and operating procedures.
- Choose the correct blade for the material being cut.
- Make sure the blade is properly secured and the blade guard is down.
- Make sure the blade has no damage (chips or cracks).

METAL / NONMETAL
Serious Injury Accident

Surface Gravel Mine – After repairing a conveyor belt and before reinstalling the tail pulley guard, a miner started the conveyor to train the belt. While the conveyor was in motion, the miner removed a rock from the tail pulley. His right arm was caught in the smooth tail pulley assembly and badly injured.

Best Practices

- Power OFF and block equipment against hazardous motion before repairing
- Lock out and tag out conveyor power switches before you work on equipment
- Use your own lock and tag
- Ensure guards are adequate and securely in place before operating equipment
- If equipment cannot be adjusted with the power OFF, make sure persons are protected from hazardous motion
- Never remove spilled material from beneath unguarded belt conveyor drives and tailpieces while conveyors are in motion
- Never clean conveyor pulleys while the conveyor is in motion
- Never cross moving belt conveyors, except at protected crossings
- Never enter an area along a moving conveyor belt where clearance is restricted

METAL / NONMETAL SERIOUS ACCIDENT

Pipe Installation – Stay Clear of Suspended Loads

Underground Silver Mine – A miner was connecting the discharge pipe to the pump. When the crane operator lifted the pipe and began moving it towards the pump, the victim walked between the pump and the moving pipe and was caught between the pipe and the pump fitting. The victim suffered crushing injuries to his chest area.

Best Practices

- Establish safe work procedures and identify and remove hazards before beginning a task.
- Train persons to recognize the hazards associated with performing a task.
- Do not place yourself in a position that will expose you to hazards while performing a task.
- Monitor personnel routinely to determine that safe work procedures are followed.
- Implement measures to ensure persons are properly positioned and protected from suspended loads.

METAL/NONMETAL
Serious Accident

Limestone mine- During a blast, fly rock left the mine site and struck the windshield of a pick-up truck traveling by on a public road near the mine site. The driver and the passenger both received minor injuries.

Best Practices

- Consider mine specific conditions and rock strata when designing blasts to prevent fly rock. Closely follow mine policies and procedures through all phases of the blasting operation.
- Maintain and use all available methods of communication, such as sirens and radios, to warn persons of impending blasting operations.
- Schedule blasting between shifts or on off-shifts. Utilize suitable blast shelters for all persons at the mine site during blasting.
- Take special precautions to ensure that all roadways and regularly traveled areas are blocked to prevent access by persons unaware of an impending blast.

METAL/NONMETAL
Serious Accident

Crushed & Broken Stone mine - Miner entered the impact crusher to remove a blockage. Rocks fell from the feeder above and engulfed him up to his knees. Afterward, two miners entered the crusher and freed him.

Best Practices

- Establish and follow safe job procedures that mitigate hazards when unplugging discharge chutes.
- Evaluate a task before performing work.
- Position yourself in a safe location where you are not exposed to hazards.
- Never enter a location where unexpected or unanticipated sliding material could entrap you.
- Close supply and discharge points and wear a safety harness and lanyard, which is securely anchored, prior to entering bins, hoppers, tanks, or silos.
- Use Lock - Tag - Try whenever: Placing any part of one's body where it could be injured by moving machinery parts or release of stored energy (hydraulic or pneumatic pressure, steam, springs, objects that could fall or pivot).

METAL / NONMETAL
Serious Accident

Surface Limestone – A miner operating an empty articulating haul truck lost control on a downhill grade and overturned. The driver was hospitalized with serious injuries but survived, likely because he was wearing his seat belt.

BEST PRACTICES

- Always wear a seat belt when operating mobile equipment.
- Task train mobile equipment operators adequately and ensure each operator can demonstrate proficiency in all phases of mobile equipment operation before performing work.
- Conduct adequate pre-operational checks and correct any defects affecting safety in a timely manner prior to operating mobile equipment.
- Maintain control of self-propelled mobile equipment while it is in motion.
- Post safe speed limits for the mine roads and remind mobile equipment operators to reduce speed when weather conditions change.

Root Causes

- **Failure to**
  - **Provide Task Training**
  - **Conduct Examinations**
  - **Conduct Risk Assessment**
  - **Conduct Pre-operational Checks**
  - **Maintain Equipment**
  - **Provide Policies, Procedures, Controls**
  - **Provide Personal Protective Equipment**

Metal and Nonmetal Initiatives Since Aug 3, 2015

Focused Enforcement

- Only 2 fatalities to date since August 3, 2015
- 34 Impact Inspections

Initiatives

• Workplace Exams	August 2015
• Seasonal Safety	October 2015
• Confined Space	November 2015
• Go Home for the Holidays	December 2015
• Lock-Tag-Try	January 2016

CONFINED SPACE ENTRY HAZARD ALERT

Unsafe work in confined spaces has led to miner deaths and injuries in the metal and nonmetal mining industry. Recent tragic incidents include: a fatality while cleaning the inside of a tanker railcar and a miner being severely burned during maintenance of a baghouse screw hopper. To address these regrettable occurrences, special emphasis should be placed on enforcing MSHA standards related to entering bins, hoppers, silos, tanks, and surge piles. A best practice is to conduct a hazard assessment and implement a permitting system as part of a safe entry standard operating procedure (SOP).

Best Practices

- Identify all possible confined spaces at a mine and associated hazards.
- Inform miners by posting danger signs "Confined Space Do Not Enter Permit Required" - Do not allow unauthorized entry.
- Plan - Establish a written SOP that includes a permit to work and enter system, communication and emergency plan and train miners on the plan.
- Identify authorized entrants.
- Isolate the space. Assure energy sources are deenergized (lockout & tag out).
- Conduct pre-entry testing. Test the internal atmosphere for oxygen content, flammable gases and vapor, and potential toxic air contaminants.
- Monitor the atmosphere. Continuously monitor conditions in areas where authorized entrants are working. Provide an early-warning system. Assure that monitoring procedures will detect an increase in atmospheric hazard levels in sufficient time for the entrants to safely exit the permit space.
- Do not enter an area that has less than 19.5% oxygen.
- Assign an "attendant" – someone to maintain contact with the entrant while they are in the confined space.
- Do NOT enter a confined space in an attempt to rescue a downed employee or co-worker if you don't know the atmospheric condition or have special lifesaving equipment. Rescue attempts in a toxic atmosphere by untrained personnel are extremely dangerous and can lead to multiple deaths.

MSHA standards related to hazards of entering bins, hoppers, silos, tanks, and surge piles

- CFR Parts 56/57.16002 - Bins, hoppers, silos, tanks, and surge piles have to be equipped with mechanical devices or other effective means of handling material to assure that miners are not required to enter or work in areas where they are subject to being entrapped by either caving or sliding materials during normal mine operations. If miners have to enter areas to perform maintenance or inspection work, ladders, platforms, or staging equipment has to be provided. No miner is permitted to enter a facility until the supply and discharge of materials has ceased and the supply and discharge equipment is locked out. Miners entering the area shall wear a safety belt or harness equipped with a lifeline properly fastened. A second person, similarly equipped, has to be stationed near the lifeline fastening and constantly adjust the lifeline to assure minimum slack.
- CFR Part 56/57.14105 – Repair and maintenance is performed only when machinery or equipment is powered off and miners are protected against hazardous motion.
- CFR Parts 56/57.15006 & .5005 - Protective equipment and clothing and proper respiratory protection has to be available and in reliable condition whenever hazards or irritants exist. Assure monitors are properly calibrated.
- CFR Parts 56/57.5001 & .5002 - Measurement of airborne exposure limits and monitoring of dust, gas, and fumes has to be conducted to determine the adequacy of control measures.
- CFR Part 57.5015 – A minimum 19.5% volume of oxygen content has to be maintained in active underground work areas.
- CFR Parts 46 & 48 - Miners must be trained and retrained.

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Best Practices

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METAL/NONMETAL MINE FATALITY – On July 15, 2015, a 25-year old contractor with 6 months of experience was killed at a Kaolin processing plant. The victim was working alone and entered a railcar to wash out residual product. The victim was later found unresponsive inside the railcar.

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Best Practices

- Oxygen deficiency is the leading cause of confined space fatalities. Check the atmosphere inside the confined space for adequate oxygen, toxic contamination and accumulation of flammable gases with a suitable gas detector before entering the confined space. Wear supplied air respirators when making these examinations.
- Prior to use, gas detection equipment should calibrated or bump tested per manufacturer recommendations and miners should be task trained in the use of such equipment.
- Miners working within confined spaces should never work alone. Ensure that a trained person is posted outside the confined space to monitor the miner working in the confined space. The miner working in the confined space should be attached to a lifeline.
- The person outside of the confined space should be ready to summon help if the miner inside the confined space requires assistance. The person monitoring should carry a portable radio to call for assistance in an emergency. No miner should ever enter a confined space to conduct a rescue without awareness of the hazard(s) present and appropriate personal protective equipment.
- Purging of the confined space to remove contaminants should be done before entry by means of a high volume of fresh air flow. Mechanical ventilation may be necessary to ensure an adequate supply of fresh air is provided for miners working in the confined space.
- Miners MUST be adequately informed and trained for the hazards they will encounter. The mine operator should have a plan that addresses confined space entry, monitoring, (attendance) and rescue specific to the types of confined spaces at the mine.

Lock - Tag - Try

Since 2005, 28 metal and nonmetal miners have died in electrical and machinery accidents in which power was not disconnected and locked out before work was begun on power circuits or equipment.



Lockout - Tagout - Tryout procedures (LOTO) ensure that all energy sources are isolated before electrical or mechanical work is performed. LOTO protects miners from the dangers of uncontrolled, unplanned release of energy (movement of equipment or materials; electrical, hydraulic or pneumatic), or toxic materials.

1. Stop the equipment, disconnect power and lock the switch.
2. Attach your identifying tag.
3. With miners in the clear, try to start the equipment or test for power.

IT'S NOT LOCKED OUT UNTIL YOU'VE TRIED IT OUT!

MSHA's LOTO standards address electrical and mechanical hazards

- Electrical lockout
  - 30 CFR §§56/57.12006 - Distribution boxes
  - 30 CFR §§56/57.12016 - Work on electrically powered equipment
  - 30 CFR §§56/57.12017 - Work on power circuits
- Mechanical lockout
  - 30 CFR §§56/57.14105 - Procedures during repairs or maintenance

Best practices for an effective Lock - Tag - Try Program

1. Use Lock - Tag - Try whenever:
   - Removing or bypassing a guard or other safety device for maintenance, repair, cleaning, or clearing jammed mechanisms.
   - Placing any part of one's body where it could be injured by moving machinery parts or [illegible] of stored energy (hydraulic or pneumatic pressure, steam, springs, objects that could fall
   - Placing any part of one's body into an electrical energy or hazardous [illegible]
2. Identify and control stored energy: mechanical, electrical, hydrau[illegible]nical, thermal.
3. Identify proper lockout locations - disconnect main or cir[illegible] off switches, interlocks, emergency stops or selector switches.
4. Develop machine-specific lockout proced[illegible]
5. Each person uses his/her personal [illegible] duplicate locks or keys.)
6. Clearly defined group lo[illegible]sed for complex jobs involving multiple miners, equipment or en[illegible]
7. Each per[illegible]ne's own lock and tag. Verify mechanical equipment is isolated by t[illegible]. Electricians verify electrical circuits are deenergized by testing. Keep miners cle[illegible]. and hazards during the "try out" process.
8. Use [illegible]only for lockout, not for securing toolboxes or lockers.
9. Train all miners who use locks and tags on proper procedures. Provide awareness training to other miners.
10. Address contractor responsibilities and procedures.
11. Periodically review lockout program. Add or modify procedures when new equipment is installed or procedures. Retrain miners as needed.

It's not locked out until you've tried it out!

Fatality #6 - March 28, 2005
Electrical - TX - Limestone (C&B)
Capitol Aggregates LTD - Fairland Quarry

METAL/NONMETAL MINE FATALITY -On March 28, 2005, a 49-year-old contractor electrician was fatally injured at a surface stone operation. The victim was performing repairs inside an electrical box when he contacted an energized component.

Fatality #25 - September 20, 2007
Powered Haulage - Alaska - Sand & Gravel (Construction)
Wilder Construction Company - Conrock North Pit

METAL/NONMETAL MINE FATALITY - On September 20, 2007, a 49 year-old laborer with 32 years experience (2 days at the mine) was fatally injured at a sand and gravel operation. The victim went behind a guard, used a wooden handle shovel to clean under a conveyor belt take-up pulley, and was entangled in the pulley.

Fatality #7 - May 24, 2010
Machinery - Oklahoma - Limestone, Crushed and Broken
U.S. Lime Company - St. Clair - U.S. Lime Company-St. Clair

METAL/NONMETAL MINE FATALITY - On May 24, 2010, a 61-year-old maintenance foreman with 32 years of experience was fatally injured at a crushed stone operation. The victim entered a vertical roller mill without locking out the electrical power switch. The mill was started with the victim in the mill.

Fatality #3 - February 24, 2011
(Deemed Chargeable 4/11/2011)
Powered Haulage - Utah – Construction Sand and Gravel
Bolinder Resources LLC - Crushing and Sampling Unit

METAL/NONMETAL MINE FATALITY - On February 24, 2011, a 56 year- old equipment operator with 10 years of experience was killed at a sand and gravel operation. He was cleaning a tramp metal magnet on a belt conveyor when it started.

Thanks for your attention!

Any Questions??