Another Five To Stay Alive

Based on information from MSHA's "Rules To Live By III"

Presented by DMME

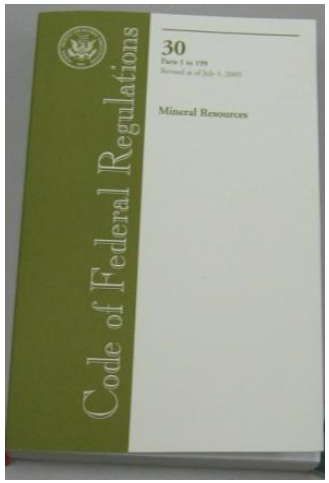
Division of Mineral Mining

2012

MSHA's Rules to Live By III

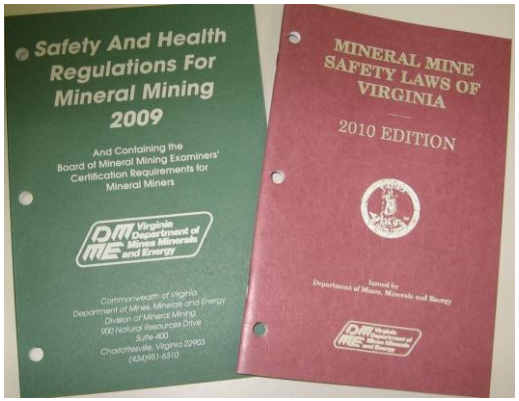
- The third installment of the rules to live by campaign highlights 14 standards cited as a result of at least five mining accidents and resulting in at least five fatalities during the 10-year period from January 1, 2001 to December 31, 2010.
- 8 of the standards are from coal and 6 are from Metal/Non-metal. Of the 6 M/NM standards, 4 are from Part 56 (surface), 1 is from Part 57 (underground) and the remaining 1 from Part 46. The 1 from Part 57 deals with correcting defects in a timely manner. The same standard is found in Part 56 and is among the 5 we will discuss here.

The Five From Parts 46 & 56



- Since the vast majority of Virginia M/NM sites work under Parts 46 & 56, we will discuss only those 5 standards. They are:
  - 46.7(a) – New Task Training
  - 56.15020 – Life Jackets and Belts
  - 56.3130 – Wall, Bank, and Slope Stability
  - 56.3200 – Correction of Hazardous Conditions
  - 56.14100(b) – Safety Defects; Examination, Correction and Records

DMM Regulations



- In most cases, Virginia's mineral mining regulations dovetail very closely with MSHA's standards. Here are the 5 standards along with the corresponding Virginia regulations:
  - 46.7(a) ---------- 4 VAC 25-40-100
  - 56.15020 ---------- 4 VAC 25-40-1700
  - 56.3130 ---------- 4 VAC 25-40-390
  - 56.3200 ---------- 4 VAC 25-40-430
  - 56.14100(b) ---------- 4 VAC 25-40-145
- **Violations of these standards are violations of Virginia regulations as well!!**

The Overall Statistics

- Total fatalities in M/NM during the period – 281
- Total fatalities in M/NM associated with these standards – 41
  - **Almost 15%**
- Total MSHA M/NM fatalities in Virginia during the period – 3
- Total fatalities in Virginia associated with these standards – 1
  - **33%**

U.S. Department of Labor
Mine Safety and Health Administration

Fatalgrams and Fatal Reports
"Safety and Health are Values"

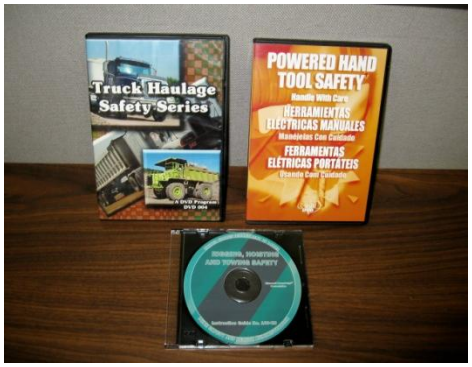
June 12, 2006 - Virginia

METAL/NONMETAL MINE FATALITY - On June 12, 2006, a 39-year-old plant operator, with 14 months experience, was fatally injured at a crushed stone operation. The victim was starting to repair a hydraulic line on a front-end loader that was parked outside of the shop. He was underneath the raised boom, loosening a hydraulic connection, when the boom arms fell, pinning him against the frame.

Best Practices

- Stop, Look, Analyze, and Manage (SLAM) each task to identify all potential hazards before performing maintenance work. Practice safe work habits during the entire task.
- Consult and follow the manufacturer's recommended safe work procedures for the maintenance task.
- Train miners in safe work procedures before beginning repairs.
- Securely block equipment against all hazardous motion at all times while performing maintenance work.
- Never travel or work under a raised loader bucket.
- Never loosen hydraulic hoses or components without first determining if they may be holding something up or trapping pressure.

46.7(a) - New Task Training



- Requires that miners reassigned to new tasks be trained in the health and safety aspects of the task including safe work procedures and applicable portions of the mine's HazCom program (Part 47). This training must be provided before the miner performs the new task.
- **4 VAC 25-40-100**: Requires new or reassigned employees be task trained and trained in the state and company regulations that apply to the new task prior to being assigned a new task. Also requires a written record of the training be kept at the mine.
- Violations contributed to 21 fatalities, including the 1 in Virginia.

Conditions & Practices

- Task training was a factor in 21 fatalities including the 1 in Virginia. Some of the specific results:
  - The miner in Virginia was crushed by the unsupported bucket arms of a front-end loader when he loosened a leaking hydraulic line for repair.
  - A miner was run over after being ejected from the cab of a wheeled loader.
  - A miner was fatally burned by a release of steam while cleaning a tank.
  - A laborer was killed when the forklift he was operating overturned.
  - A contractor was killed when a trench wall collapsed and buried him.
  - A plant laborer was killed when his arm was drawn into a conveyor belt as he attempted to adjust a return roller.

Case In Point

- 46.7(a) was cited in this case.
- The drill steel contained traces of explosives that detonated when the flame was introduced.
- The welder had not been task trained regarding explosion hazards.

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Fatalgrams and Fatal Reports

Fatality #6 – May 14, 2010
Exploding Vessel Under Pressure - Tennessee - Cement
Cemex Construction Materials Atlantic, LLC - Knoxville Cement Plant Cemex Inc.

METAL/NONMETAL MINE FATALITY - On May 14, 2010, a 35 year-old mechanic/welder with 4 years of experience was fatally injured at a cement operation. The victim was using an oxy- acetylene torch to cut a damaged drill steel to salvage the drill bit. The drill steel exploded causing metal fragments to strike the victim.

And It Continues

2011:

46.7(a) was cited in this fatality. The victim accessed an unguarded head pulley. He had not been trained to work with plant equipment.

U.S. Department of Labor
Mine Safety and Health Administration

Fatalgrams and Fatal Reports

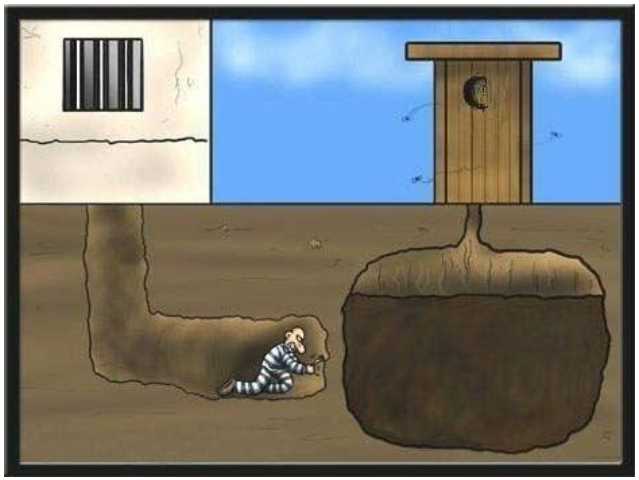
Fatality #7 - August 9, 2011
Powered Haulage - Minnesota – Construction Sand and Gravel
4 J's Gravel Crushing - 4 J's Gravel Crushing

METAL/NONMETAL MINE FATALITY - On August 9, 2011, a 24-year-old skid-steer loader operator with 12 weeks of experience was killed at a sand and gravel operation. He accessed an elevated platform near an unguarded head pulley and became entangled in the operating conveyor system.

Best Practices

- Task train new or reassigned miners in all phases of the health and safety aspects of any new task, including safe work procedures.
- The person(s) providing the training must be competent/knowledgeable of all safety requirements and proficient in the safe operation of any equipment included in the training.
- Ensure that miners receive task training PRIOR to performing the new task, including any maintenance or repair tasks associated with machinery or equipment.
- Ensure that training for mobile equipment operators includes a thorough review of the operator's manual.

Recommendations



- Review task training records for accuracy with all miners.
- Be certain you have an acceptable task training plan.
- Be certain training is being done according to the plan:
  - Are the people listed in the plan as providing training in fact the ones doing it?
  - Is the training being provided for the amount of time shown in the plan?
- Make sure training includes properly conducting a pre-op inspection. Check with operators to ensure proper inspections are being done.
- Take time to specifically observe how people are performing their jobs. Make corrections or retrain as needed.

56.3130 – Wall, Bank, and Slope Stability

- Requires mining methods be used that will maintain wall, bank, and slope stability in places where persons work or travel in performing their assigned tasks. When benching is necessary, the width and height shall be based on the type of equipment used for cleaning of benches or for scaling of walls, banks, and slopes.
- **4 VAC 25-40-390** requires mine operators use mining methods which will ensure ground, wall, bench and bank stability, including benching and sloping at the angle of repose as necessary.
- Violations contributed to 6 fatalities in 6 accident investigations.

Conditions & Practices

- 6 deaths resulted from violations of this rule. Some of the specifics:
  - A mine foreman was buried when a highwall failed while he operated a bulldozer at the toe of the highwall.
  - An excavator operator was crushed in his cab when the ground failed causing the excavator to slide down an embankment and fall on its side.
  - A forklift operator drowned when a bank sloughed causing the forklift to fall into the water.
  - A mine company president was fatally injured inside the cab of a front-end loader when a highwall collapsed as he moved material from the base of the highwall.

Case In Point

- 56.3130 was cited in this fatal accident.
- The mine operator was aware that an underground cavity/cavern extended under this area and took no action to address the hazard.

U.S. Department of Labor
Mine Safety and Health Administration

Fatalgrams and Fatal Reports

Fatality #23 - December 23, 2010
Falling, Rolling, Sliding Material - Florida - Crushed, Broken Limestone NEC
MID Coast Aggregates LLC - Mid-Coast Aggregates LLC-Mazak Mine

METAL/NONMETAL MINE FATALITY - On December 23, 2010, a 35 year- old contract blaster with 12 years of experience died at a crushed stone operation. After firing the blast, he immediately walked into the blast site to examine the shot material. The victim was approaching the edge of the shot material when the ground collapsed, engulfing him in the water-filled pit.

Best Practices

- Evaluate the stability of the ground prior to operating equipment near any drop off or edge.
- Use equipment that can be operated from a safe location when accessing pond banks or pit banks (top and bottom) and quarry walls (base or rim). Follow proper procedures regarding equipment type and positioning.
- Certified foremen and miners must inspect ground conditions (test if applicable) in work areas prior to work commencing.
- Ground conditions creating hazards to persons must be taken down or supported before work or travel is permitted in the affected area.

Recommendations

- Review your beginning of shift examinations covering areas with potential ground control issues (highwalls, banks, slopes, ponds).
- Review training:
  - Do your training plans include ground control where applicable?
  - Are miners being trained to conduct ground control exams and recognize hazards in their work areas?
  - Update training plans and re-train miners as might be indicated.
- Follow-up and be certain thorough examinations are being carried out by foremen and miners.
- Do you have a written policy and procedures covering the handling of unsafe ground conditions?
  - How are hazardous conditions corrected?
  - What equipment is used?

56.3200 – Correction of Hazardous Conditions

- Requires ground conditions that create a hazard to persons be taken down or supported before work or travel is permitted in the affected area. Until corrective work is completed, the area shall be posted with a warning against entry and, when left unattended, a barrier shall be installed to impede unauthorized entry.
- **4 VAC 25-40-420, 430** require safe means of scaling be provided, hazardous areas shall be scaled before other work is performed in the area and no person shall work under or near hazardous walls, benches or banks. Hazardous conditions shall be corrected promptly, or the area shall be barricaded and posted with warning signs.
- Violations contributed to 6 fatalities in 6 accident investigations.

Conditions & Practices

- 6 fatalities resulted from hazardous conditions not being corrected or areas not being posted and barricaded to prevent entry. Some specifics:
  - 2 loader operators were killed in separate accidents due to material falling from highwalls.
  - A victim was engulfed due to the sides of a trench not being sloped or supported.
  - A fatality resulted from material being cut from a highwall and left in an unstable condition.
  - A grade setter entered an excavation cut into a steep hillside and was killed due to no sloping, supporting or posting.

Case In Point

- 56.3200 was cited in this accident.
- Material was being dumped from an upper level and allowed to flow down to the third level where the loader was operating. No effort was made to keep people and equipment out of the area while this was being done.

U.S. Department of Labor
Mine Safety and Health Administration

Fatalgrams and Fatal Reports
"Safety and Health are Values"

Fatalities #22 - August 27, 2005
Fall/Slide Material - CO - Stone (C&B)
Albert Frei & Sons Inc. - Walstrum Mine

METAL/NONMETAL MINE FATALITY - On August 27, 2005, a 26-year old front-end loader operator, with four years mining experience, was fatally injured at a crushed stone operation. The victim was digging material with a front-end loader near the toe of a bank when rocks rolled and struck the loader cab.

Best Practices

- Conduct a risk analysis. Examine work areas to identify all possible hazards. Ensure that hazards are evaluated and eliminated so tasks can be performed safely.
- Carefully examine conditions prior to performing tasks near excavated banks, trenches, or ditches.
- Ensure that trench or ditch walls are either supported or sloped to the angle of repose.
- Ensure that loose or overhanging material is taken down or barricade and post all access to the area.

Recommendations

- Review beginning of shift and after blast examinations related to ground control.
- Are all miners adequately trained to conduct work area examinations, recognize hazards and report them.
- Be certain that thorough visual inspections of ground conditions are being carried out.
- Do you have a written policy and procedures regarding the correction of unsafe ground conditions. Miners should be given a copy and receive training.

56.14100(b) – Defects; Correction

- Requires; defects on any equipment, machinery, and tools that affect safety shall be corrected in a timely manner to prevent the creation of a hazard to persons.
- **4 VAC 25-40-145 –** Mobile and stationary equipment that is to be used during a shift shall be inspected by the equipment operator. Equipment safety defects shall be reported to the certified foreman. Defects that affect the safety or health of persons shall be corrected before the equipment is used.
- Violations contributed to 5 fatalities in 5 fatal accidents.

Conditions & Procedures

- 5 deaths due to a failure to inspect and/or correct safety defects. Some of the specific conditions found:
  - Safety latches, both inoperable and not installed, that would have prevented a hoist from falling from the end of the carrier beam on a dragline.
  - A safety monitoring system was inoperable that would have sensed a low or no flow condition and shut off a liquid waste fuel pump.
  - Sump pumps installed instead of repairing leaking dredge pontoons resulting in the dredge capsizing.
  - Due to a non-functioning pressure gauge and improperly set relief valve, miners were unable to monitor and limit hydraulic pressure on a tensioning device.
  - Known safety defects on hydro-blasting equipment were not corrected.

Case In Point

- 56.14100(b) was cited in this fatality.
- The hose end attachment (stinger) was improperly sized.
- The mine operator was aware that a necessary guard was not in place and that the equipment operator did not have access to a shut-off valve.

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Fatalgrams and Fatal Reports
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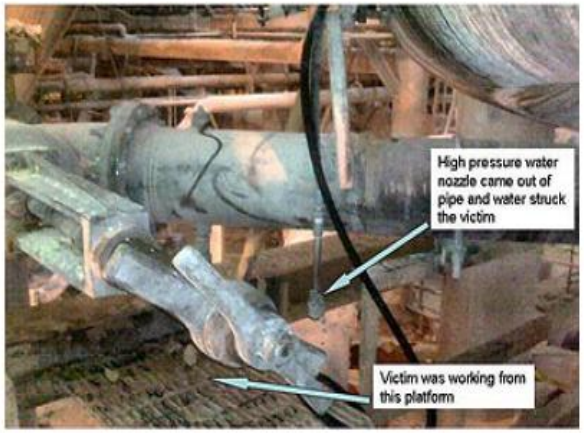
Fatality #3 - January 31, 2009
Machinery - Texas - Alumina
Sherwin Alumina Co. - Sherwin Alumina Co.

METAL/NONMETAL MINE FATALITY - On January 31, 2009, a 40 year-old contractor technician with 36 weeks of experience was fatally injured at an alumina milling operation. He was cleaning hydrate that had built up inside a 30-inch pipe in the plant. The victim was using a high pressure water hose when the unrestrained hose end and attachment blew out of the pipe. He was struck by the water.



And It Continues

2011:

56.14100(b) was cited because a jaw positioning cylinder was defective and had been removed 8 days prior to the accident, but the machine had not been taken out of service. To use the fuser, a person was required to be in an unsafe position.

U.S. Department of Labor
Mine Safety and Health Administration

Fatalgrams and Fatal Reports

Fatality #2 - March 2, 2011
Falling/Sliding Material - North Carolina – Phosphate Rock
PCS Phosphate Company Inc - Lee Creek Mine

METAL/NONMETAL MINE FATALITY - On March 2, 2011, a 51 year- old contract superintendent with 24 years of experience 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 fuser when the pipe slipped out and struck him.

Best Practices

- Always conduct complete pre-operational inspections.
  - This would include all components subject to wear and tear:
    - Connections; hoses, pipes, electrical, etc.
    - Linkage assemblies
    - Control levers and switches
  - Inspect for deformation, cracking, distortion of holes, warping and abnormal play/movement and etc.
- Inspect frames, main members and support structures for defects or cracks.
- Examine and test safety devices to ensure they are working properly; relief valves, gauges, warning lights and alarms.
- Inspections must be performed regardless of the difficulty involved in conducting them.

Recommendations

- Review workplace beginning of shift and pre-operational inspection reports to ensure thorough and complete examinations are being done.
- Accompany mobile equipment operators on their inspections to ensure their knowledge of all safety components.
  - Discuss the inspections with the operators to ensure they understand the importance of complete/thorough inspections and documenting of all defects.
- Review company policies on inspections and the handling of defects and hazards. Be certain everyone knows what they are.

56.15020 – Life Jackets & Belts

- Requires life jackets or belts shall be worn where there is danger from falling into water.
- **4 VAC 25-40-1700 –** Life jackets or belts shall be worn where there is danger of falling into water.
- Violations contributed to 6 fatalities in 6 accident investigations.

Conditions & Practices

- 6 miners drowned due to not wearing life jackets. Some of the specific circumstances:
  - A dredge operator fell from the work deck into the water.
  - Other dredge operators not wearing life jackets when there was a danger.
  - A worker drowned while attempting to help his co-worker who had fallen into the water near an embankment.
  - A plant operator's work boat capsized.

Case In Point

- 56.15020 was cited in this drowning.
- The dredge operator swam into a dredge pond to retrieve a boat without wearing a life jacket.

U.S. Department of Labor
Mine Safety and Health Administration

Fatalgrams and Fatal Reports

Fatality #15 - August 14, 2010
Drowning - Oklahoma - Construction Sand
Southwestern State Sand Corp. - Southwestern State Sand

METAL/NONMETAL MINE FATALITY - On August 14, 2010, a 23 year-old dredge operator with 4 years of experience died at a sand and gravel dredge operation. The victim and another miner were pulling a small boat from a dredge pond onto a boat trailer attached to a pickup truck. When the boat slipped back into the water, the victim attempted to retrieve it and drowned.

Best Practices

- Be certain life jackets are provided in the necessary locations and quantities.
- Miners must wear life jackets when there is a danger of falling into water.
- Life jackets must be maintained in good condition.
- Ensure that persons working around water receive proper water safety training.

Recommendations

- Review inspection reports related to water hazards.
  - Are work areas near water being properly inspected and all hazards identified?
  - Are life jackets being inspected and maintained in good condition?
- Review training plans and task training records to ensure adequate training in water hazards and the use of life jackets.

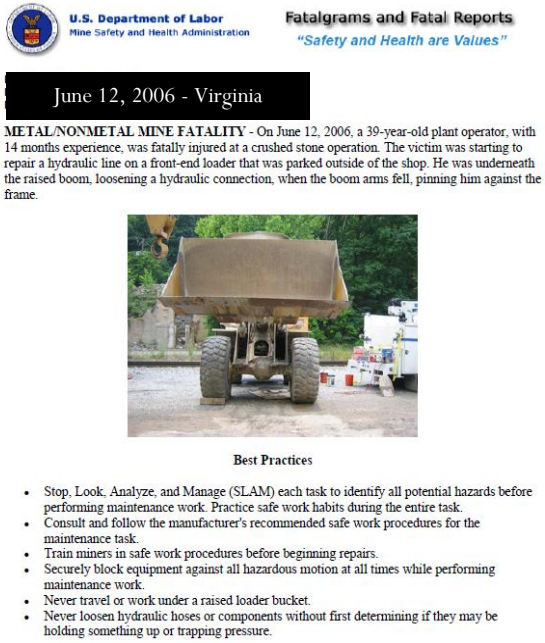
Comparing Investigation Actions - 2006

DMM Violations

- **4 VAC 25-40-100**
  - Failure to task train
- **4 VAC 25-40-1685**
  - Failure to block against hazardous motion (2 issued)
- **4 VAC 25-40-360**
  - Failure to follow manufacturer's specifications (no service manual)
- **4 VAC 25-40-120**
  - Failure by foremen to ensure work performed according to the laws and regulations (2 issued)
- **4 VAC 25-35-120.G**
  - Failure to have GMM certification on file

MSHA Citations

- **46.7(a)**
  - Failure to task train
- **56.14105**
  - Failure to block against hazardous motion



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Summary

- In the majority of cases, violations of MSHA standards are violations of Virginia regulations.
- MSHA issues citations to the company while DMM issues NOV's to the individual(s) responsible which may result in multiple NOV's.
  - DMM holds certified foremen responsible for all activities in the areas under their supervision.
  - DMM may revoke certifications for willful violations; foremen, GMM, etc.
  - DMM may prosecute willful violations as class I misdemeanors punishable by up to 1 year in jail and $2,500 fine.