Department of Labor • Mine Safety and Health Administration • Joseph A. Holmes Safety Association

BULLETIN

MARCH/APRIL 2006

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The Department of Labor, Mine Safety and Health Administration and Joseph A. Holmes Safety Association Bulletin contains safety articles on a variety of subjects: fatal accident abstracts, studies, posters, and other health and safety-related topics. This information is provided free of charge and is designed to assist in presentations to groups of mine and plant workers during on-the-job safety meetings. For more information, visit the MSHA home page at www.msha.gov.

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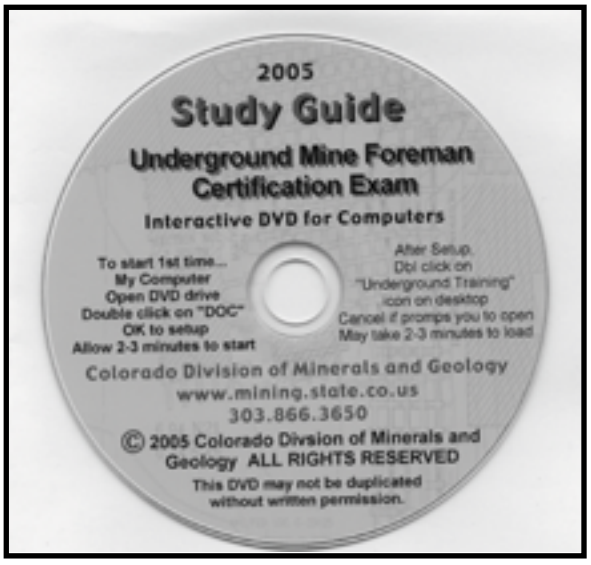


NEW INTERACTIVE TRAINING TOOLS AVAILABLE TO COAL AND AGGREGATE OPERATORS

By Bill York-Feirn
Colorado Mine Safety & Training Program

The Colorado Mine Safety & Training Program (MSTP), in late 2005, completed and began distributing two new training tools; one geared to underground coal mine foremen and the other to surface aggregate employees.

Through strong partnerships with MSHA, Colorado Coal Mine Board of Examiners, Colorado Mining Association and the Colorado Rock Products Association, the MSTP continues to create innovative and interactive training tools for not only Colorado, but for the national mining community. "Although we shoot and produce these materials in Colorado, it's important to us to make sure they are useful nationally," said Bill York-Feirn, MSTP Manager.

The interactive DVD program "Underground Mine Foreman Certification Study Guide (Coal)," was completed in October 2005. It won the 2005 Grand Prize at the MSHA National Training Materials Competition in Beaver, West Virginia.

This program is fully based upon the requirements of Title 30 Code of Federal Regulations (30 CFR) Parts 48, 50, 70 and 75 for underground coal mine foremen. It contains eight modules plus immediate access to relevant laws in the appendix. Topics covered include: Federal Law, Practical Math Skills, Mine Gases, Ventilation Maps, and scenarios addressing a variety of practical mining concerns. The DVD is designed for self-paced study and practice.

(See next page)

The DVD has been well received, and the Colorado Coal Mine Board of Examiners has adopted the program as their official study guide for underground coal mine foreman certification candidates.

John Barton, MSTP trainer and project leader says, "The DVD format fits today's technology and allows users to access vast volumes of information and practice problems to help mine foreman candidates hone their skills before they take the certification exam." Large amounts of video footage and printable study aids assist the candidate in grasping the concepts and seeing them in real coal mine situations. As MSHA statutes and regulations change, the program can be easily updated to reflect those changes. Since the DVD program has been distributed, members of the Colorado Coal Mine Board of Examiners have commented that the quality of work on the exam has greatly improved. The exam pass rate has also begun to increase, particularly among new candidates. Copies of this DVD program are available for $15 each from the contacts at the end of this article.

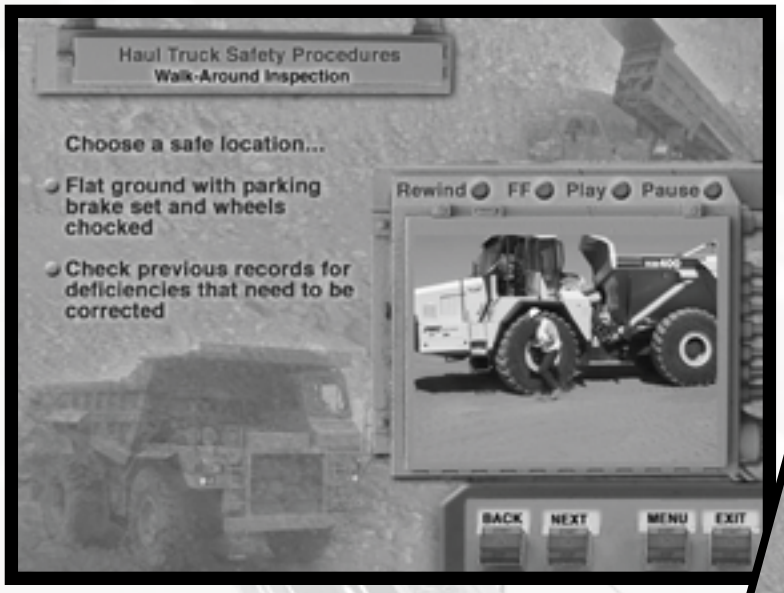
The Colorado Rock Products Association, the MSTP, members of the Colorado aggregates industry, and Focus On Training, LLC collaborated to produce a series of interactive CD-ROMs (now available in DVD format) on task training at aggregate operations.

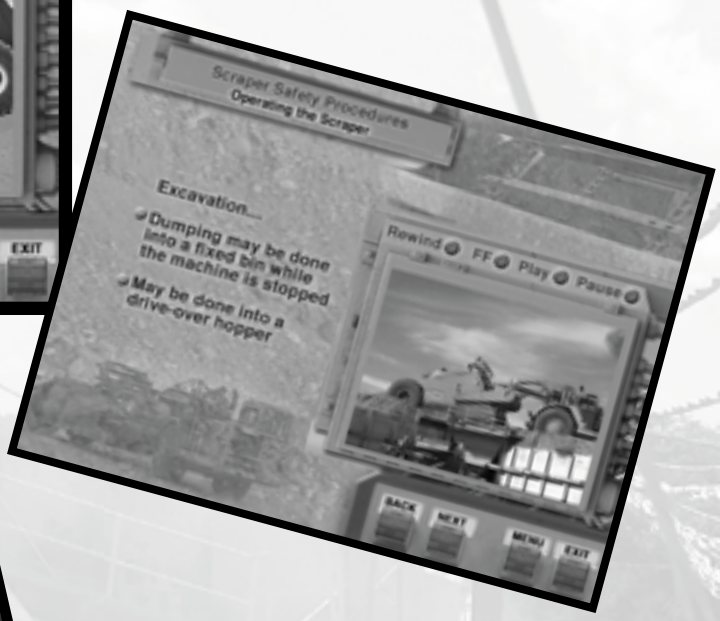
"Task Training II – Excavator Operators, Scraper Operators, Haul Truck Operators" was released in November 2005 as the second in a three-part series. This is the follow-up to the award-winning "Task Training I – Loader Operators, Plant Operators, Laborers."

The Task Training II program won a 2005 Special Recognition Safety Award presented by the Colorado Mining Association in February, 2006. Mine operators have requested these training tools to address their task training needs for the common jobs performed at aggregate sites.

The interactive task training program is designed for both new and existing employees who may be new to the task or may need a refresher. The CDs are divided into modules dedicated to each separate job.

Each module is packed with video footage from Colorado aggregate sites that cover five main areas: Overview of the Job, Safety Concerns, Pre-shift Inspection, Proper Operation and Shutdown and Post-





Each module is packed with video footage from Colorado aggregate sites.

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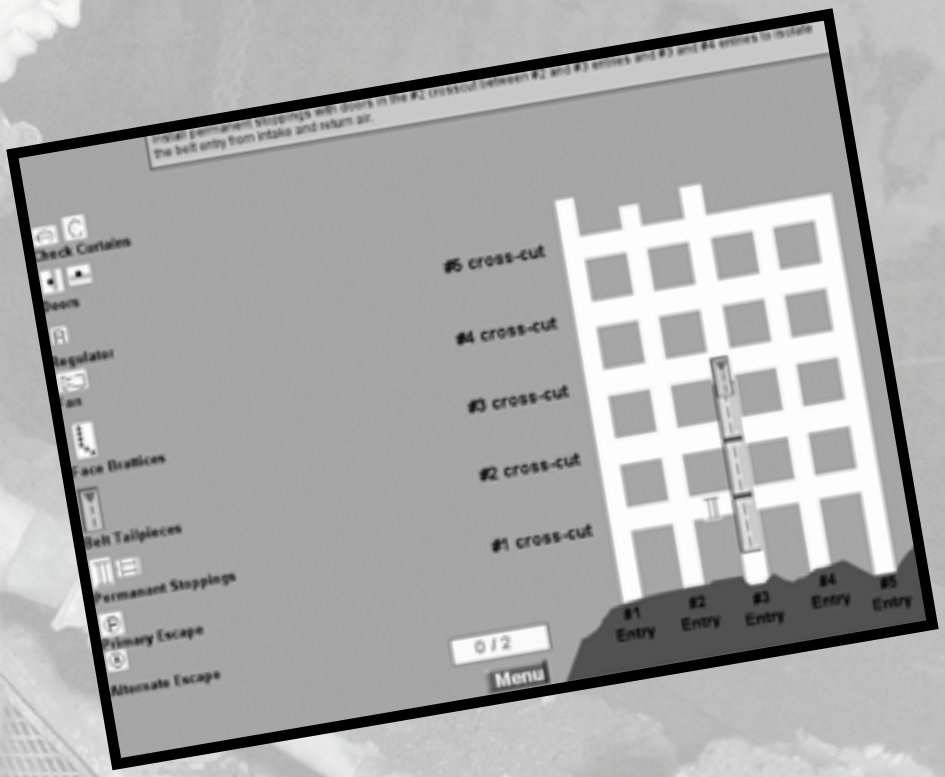
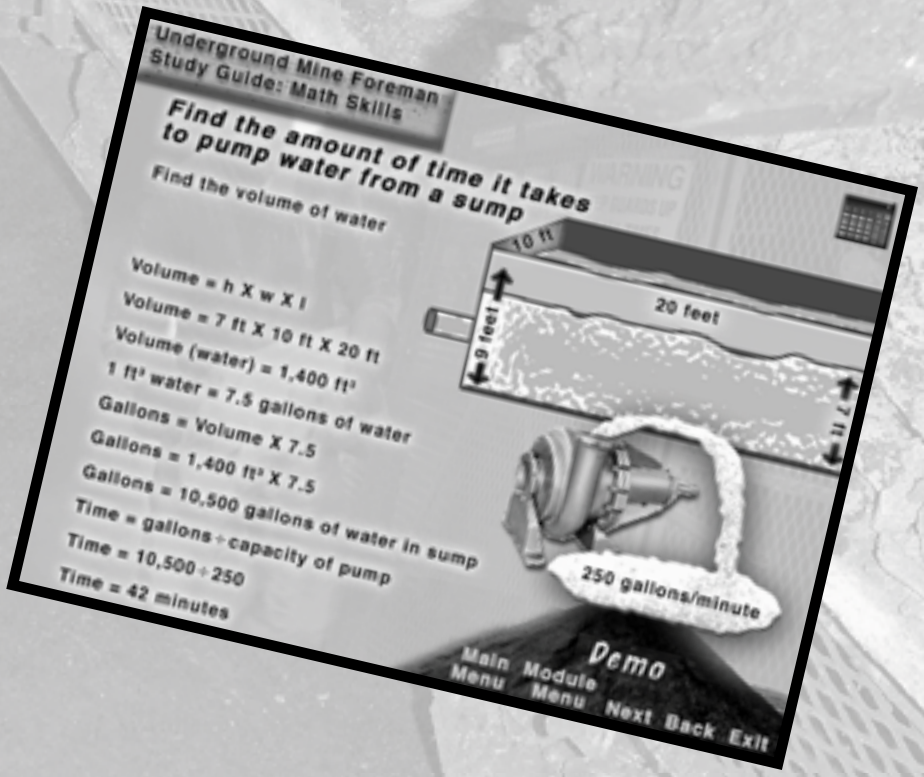
The modules are self-paced and contain exercises for users to practice their knowledge.





Safety Concerns, Pre-shift Inspection, Proper Operation and Shutdown and Post-Shift Procedures. The modules are self-paced and contain exercises for users to practice their knowledge.

Users can see what they have learned at the end of each module by taking a 10-question quiz randomly selected from a test question bank. If the user is unable to pass the quiz, they are sent back to review the module before attempting the quiz again. A certificate can be printed out as a record of successful completion of each module.

The Task Training CD-ROMs can be used either by individual mine for self-study or projected to use in a classroom setting. The program is an excellent supplement to on-site, hands-on training and can be accessed at almost any time.

These exciting, new products offer consistent and effective training to mine employees at both underground coal and aggregate operations. Many portions of these tools are applicable to other types of mining operations as well.

To order the "Underground Mine Foreman Certification Study Guide (Coal)," and see a list of other training materials offered by the MSTP, go to www.mining.state.co.us and click on 'Mine Safety' or contact Kim Harvill at (303) 866-3913.

To order your copy of either "Task Training II – Excavator Operators, Scraper Operators, Haul Truck Operators," or "Task Training I – Loader Operators, Plant Operators, Laborers," contact the Colorado Rock Products Association at 1-800-877-0785 or www.crmca.org.
Bill can be reached at:
bill.york-feirn@state.co.us or
(303) 866-3650.
Contacts for MSTP staff members are:
john.barton1@state.co.us,
joe samek@state.co.us,
scott.waybright@state.co.us,
and kim.harvill@state.co.us

What Difference Does Age Make? Part 3: Metal Ore Mine Injuries

Launa Mallett, Robert H. Peters, and Diana J. Schwerha
Pittsburgh Research Laboratory
National Institute for Occupational Safety and Health

According to the Bureau of Labor Statistics for the year 2002, the metal ore mining workforce had a higher median age (42.3 years) than the workforce of all employed persons in the U.S. where the median age was 40.1 years. Chart 1 shows the number of metal mine workers in selected age groups in 2002. Miners numbering 16,000 (47% of the workforce) were over 44 years old. When looking at the ten-year age groups, one would expect the percentage of workers in each group to be equal if workers were entering and leaving the industry in a consistent way. Instead, the age groups increase in size through age 54. The largest group (38.2%) is the age category from 45-54. Less than a quarter of the workforce (23.5%) is under age 35.

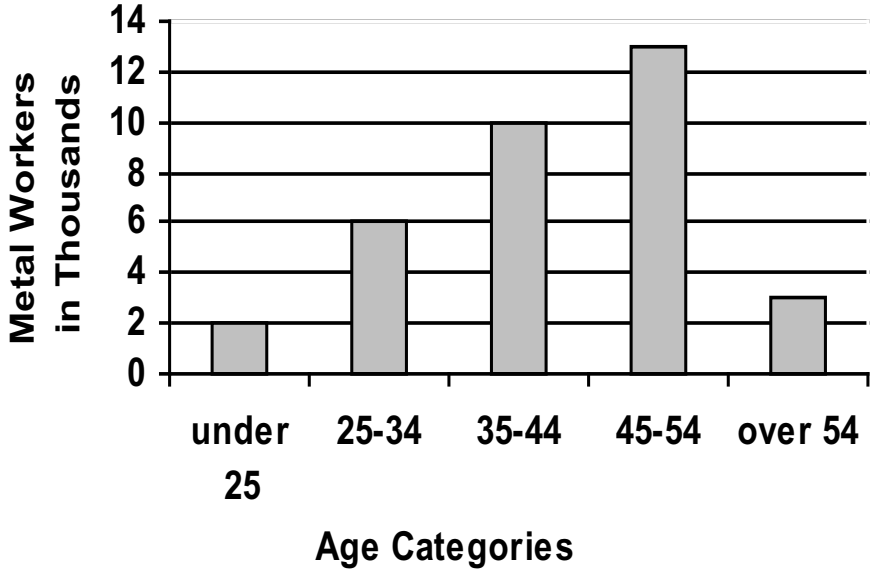


Chart 1: Number of Metal Ore Mine Workers
(Source BLS Current Population Survey 2002)

We see similar trends in the data for surface mines and mills when we look at injuries reported to the Mine Safety and Health Administration (MSHA) for 2002. The underground pattern is somewhat different. Metal ore mine operators reported 1,090 injuries in 2002. The average age for injured underground metal miners was 38 years. It was 43 years for surface miners and 43 years for mill workers. When divided into age categories, the largest groups at surface mines and mills were the 45 to 54 year old miners. At underground mines it was the 35-44 year old group. See Charts 2a through 2c.

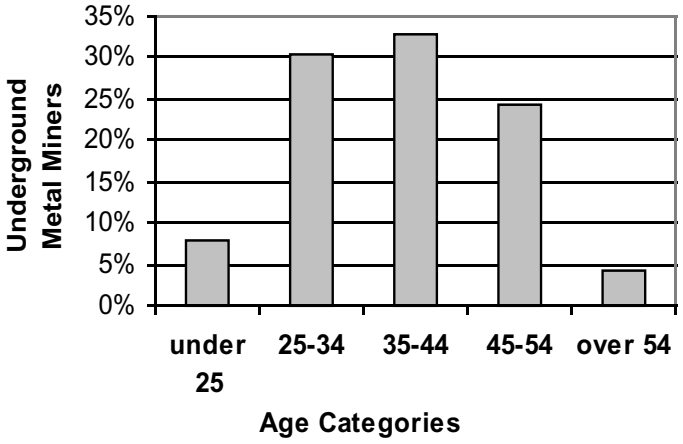


Chart 2a: Percent of Injured Underground Metal Miners
(Source MSHA 2002)

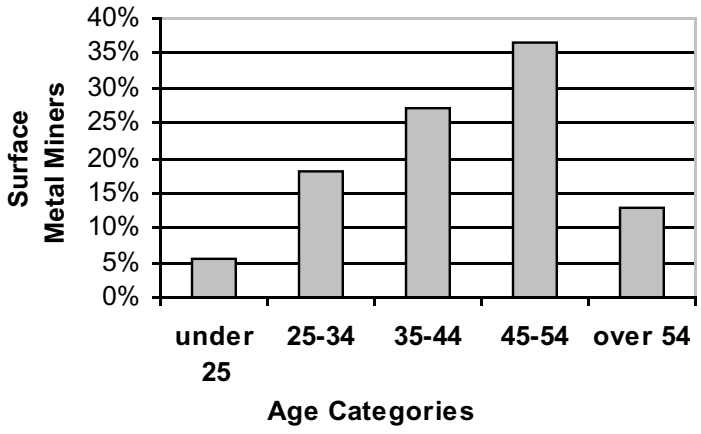


Chart 2b: Percent of Injured Surface Metal Miners
(Source MSHA 2002)

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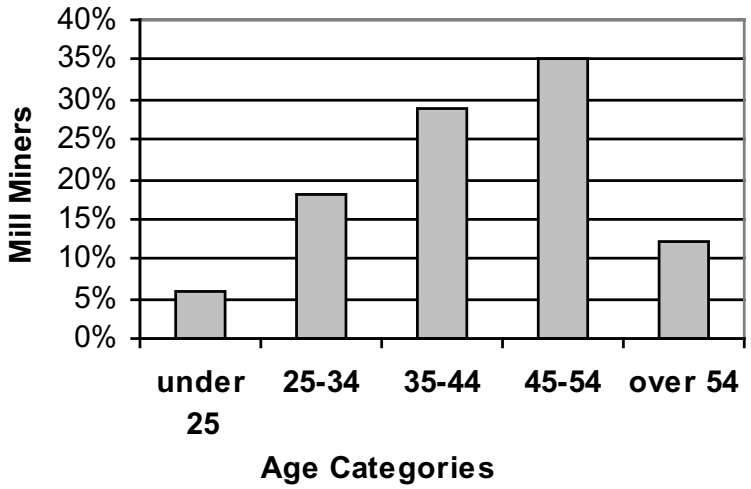

Chart 2c: Percent of Injured Metal Mill Workers
(Source MSHA 2002)

Looking at generational categories is another way to explore mining injury data. While there are different ways that people categorize the generational groups, they are all fairly similar. One strategy identifies the groups as 1)Veterans, aged 60 and above, 2) Baby Boomers, from 42 to 59 years old, 3) Generation Xers, 22 to 41 years old, and 4) Nexters, younger than 22 year old (Zemke et al., 2000). Table 1 shows the metal miner injury data broken into these generational categories. We can do further breakdowns to explore differences in injured miners by generational group.

Location	Nexters	Xers	Boomers	Veterans
Underground (n= 247)	1.6	61.1	35.6	1.6
Surface (n=290)	0.7	39.3	55.9	4.1
Mill (n=487)	1.0	38.4	58.7	1.8

Table 1: Percent of Injured Miners in Generational Categories
(Source MSHA 2002)

An examination of accidents by classification reveals differences in the injury experiences across the generational groups. “Handling materials” is the top accident class for all generational groups at metal mills. Table 2 and Chart 3 show that the percentage of mill injuries classified as “handling materials” increases with the age of the generational group. Conversely, the category “handtools” accounts for a decreasing percentage of reported injuries with the age of the generational group. See Table 2.

Group	Accident Class	Percent of Group*
Handling material	Nexters (n = 2 of 5)	40.0
	Xers (n = 78 of 187)	41.7
	Boomers (n = 136 of 286)	47.6
	Veterans (n = 5 of 9)	55.6
Handtools	Nexters (n = 2 of 5)	40.0
	Xers (n = 37 of 187)	19.8
	Boomers (n = 34 of 286)	11.9
	Veterans (n = 0 of 9)	0.0

Table 2: Accident Class of Injured Mill Workers by Generational Group
*Only categories accounting for 10% or more of group total are listed. (Source MSHA 2002)

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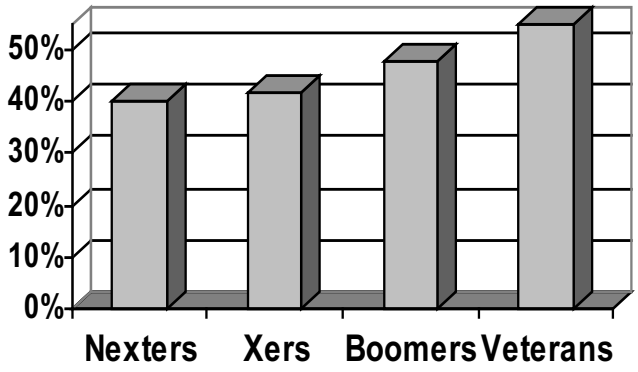


Chart 3: Percent of Mill Injuries Classified as Handling Materials by Generational Group (Source MSHA 2002)

Experience is tied to age. Injured miners in the older generational categories are expected to have greater levels of experience. For example, at mill operations over 80% of the injuries in the Boomer and the Veteran groups occurred to miners with 5 or more years of total mining experience but less than 25% of the Xers were that experienced. A more interesting finding, however, is the amount of experience the injured miners had at the mine where they were working and in the job they were doing at the time of the event. Looking at the Xer and Boomer groups at all locations, the percentage of miners with 2 years or less experience at the job they were doing at the time of injury was considerably larger than the percentage of miners with that level of total mining experience. We see a similar trend in the percentage of miners with two years or less experience at the mine where they were working at the time of injury suggesting increased risk of injury for all miners new to a work environment. See Charts 4a through 4c.

Chart 4a: Percent of Injured Mill Workers with 2 or Less Years Experience by Generational Group (Source MSHA 2002)

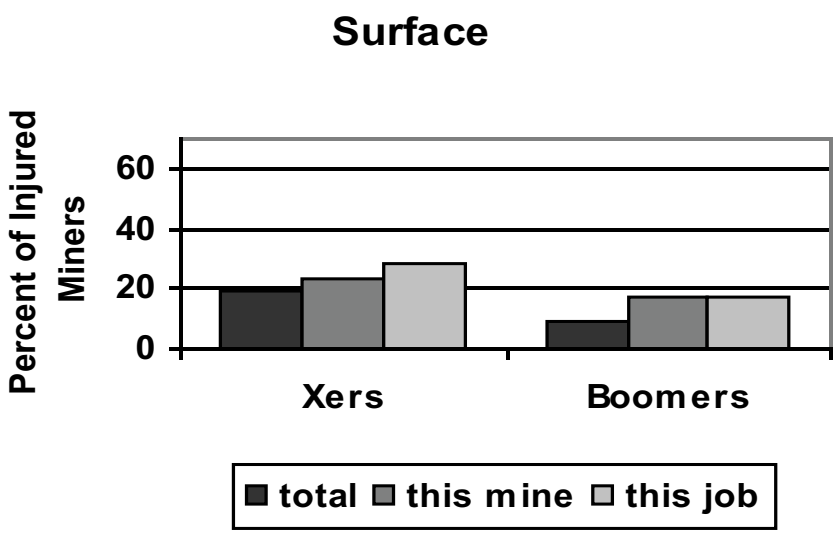


Chart 4b: Percent of Injured Surface Miners with 2 or Less Years Experience by Generational Group (Source MSHA 2002)

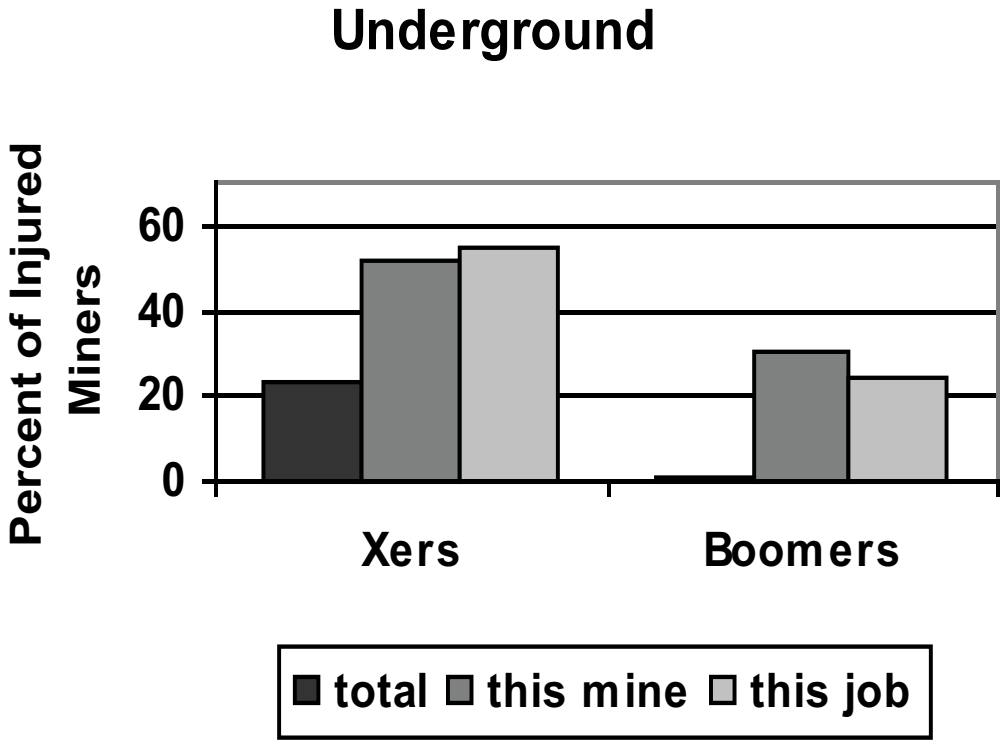


Chart 4c: Percent of Injured Underground Miners with 2 or Less Years Experience by Generational Group (Source MSHA 2002)

(See next page)

We can assess injury severity by reviewing the data collected by MSHA about the time injuries require each miner to be away from work. A longer time away from work can be equated to a more serious injury. In 2002, the numbers of lost work day injuries reported to MSHA were as follows: 104 underground, 118 surface, and 173 mill. As shown in Chart 5, the median days lost generally increased with age of the generational group.

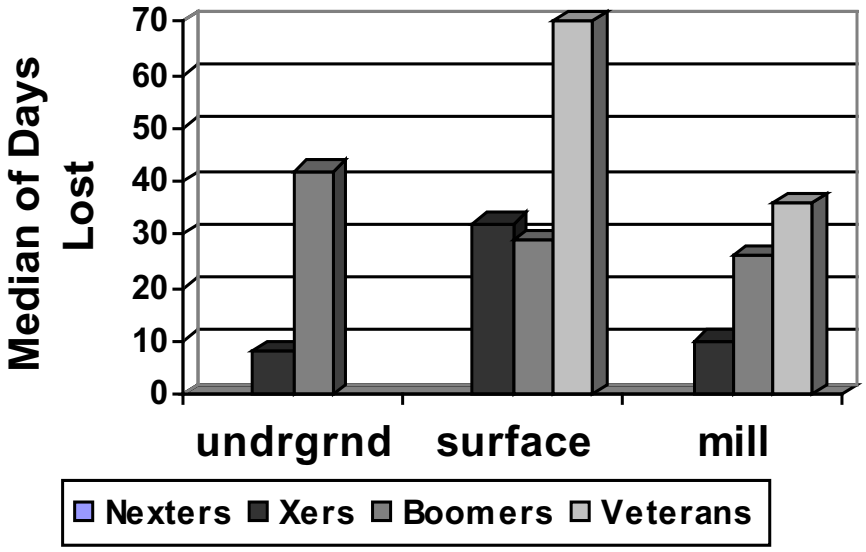


Chart 5: Median Days Lost by Generational Group
* Includes permanent disability, days away from work only, & days away AND restricted activity
Note: Days lost due to permanent disability is an assigned number rather than the actual number of days
** Median Days not reported if number of injuries <5
(Source MSHA 2002)

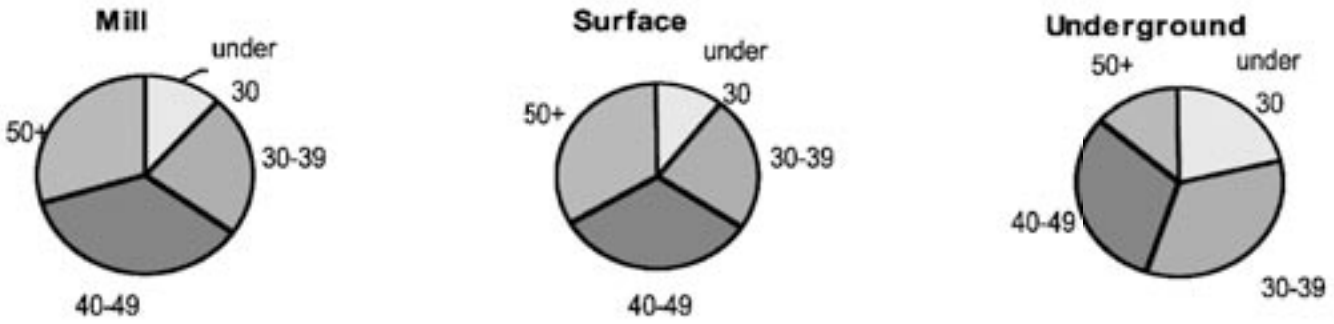


Chart 6: Percent of Injured Miners by Age Categories
(Source MSHA 2002)

The age breakdowns reported with injury data shows the metal industry varies across segments. In 2002, the oldest group was at surface mines where 66% were over 40 years old, followed by mills with 65% over 40. At underground operations, only 42% were over 40 and 21% were under 30 years old. See Chart 6. These numbers may broadly reflect the ages of the entire metal mining workforce; including those miners who were not injured during 2002.

References

Bureau of Labor Statistics, Current Population Survey, 2002.
Mine Safety and Health Administrative Employment and Accident/Injury/Illness Database 2002.

Zemke, R., C. Raines, and B. Filipczak. [2000]. Generations at Work: Managing the Clash of Veterans, Boomers, Xers, and Nexters in Your Workplace. NY: American Management Association.

Surface Maintenance Crews Beware

The mining community recently lost two members of a maintenance crew while performing routine repairs on a bucket.

Best Practices

Do NOT work under the raised bucket door, unless it is properly blocked or supported to prevent accidental closure.

Use multiple supports to block the door open (i.e., wooden cribs and cables).

Assure persons operating equipment in your immediate area are properly trained.

Analyze all aspects of the job for potential hazards before beginning work. SLAM (STOP, LOOK, ANALYZE, MANAGE) Hazards - Before, during and after the job.

Make an examination of the area where you intend to work and report all observed hazards to your supervisor. Never take for granted that someone else has examined your work area for you.

Send all miners home at end of their shift

United States Department of Labor
MSHA
Mine Safety and Health Administration

Best Practices for Mine Operators to Reduce Contractor Fatalities

- Take Responsibility for the Safety and Health of all Persons Working at the Mine Site.
- Properly train Contractors in Site Specific Hazards and Standard Operating Procedures.
- Post these Procedures in a Prominent Place for Everyone to Review.
- Coordinate the Contractor's Activities
- Evaluate the Contractor's Past Safety and Health Performance Prior to Awarding Contracts.
- Monitor Contractors to Ensure that Procedures are followed.
- Assure that all Contractor's Equipment is in Safe Operating Condition.

(See next page)

Best Practices for Contractors to Reduce Fatalities

- **Contractors should restrict access, using warning signs indicating the hazards and/or barricades, to areas where hazards may exist that are not apparent to employees.**
- **Contractors should ensure that employees stay in assigned work areas and not be permitted to venture into unfamiliar or unassigned areas.**
- **Contractors should monitor new employees closely.**
- **Independent contractors working on mine property are "miners" and must comply with MSHA regulations.**
- **Contractors shall ensure that all equipment brought onto mine property is in safe working condition and that all safety features are in good operation order.**

Contracting Should Not Be an Act of Survival

31 Contractors have died at
Metal and Nonmetal Mines since 2001

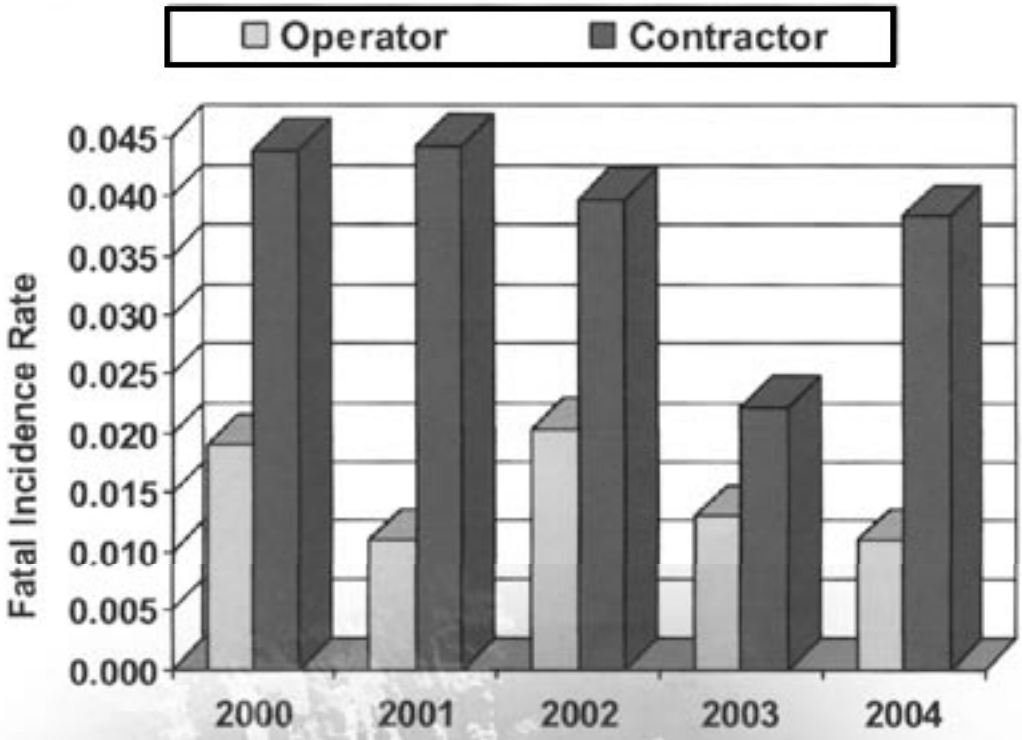


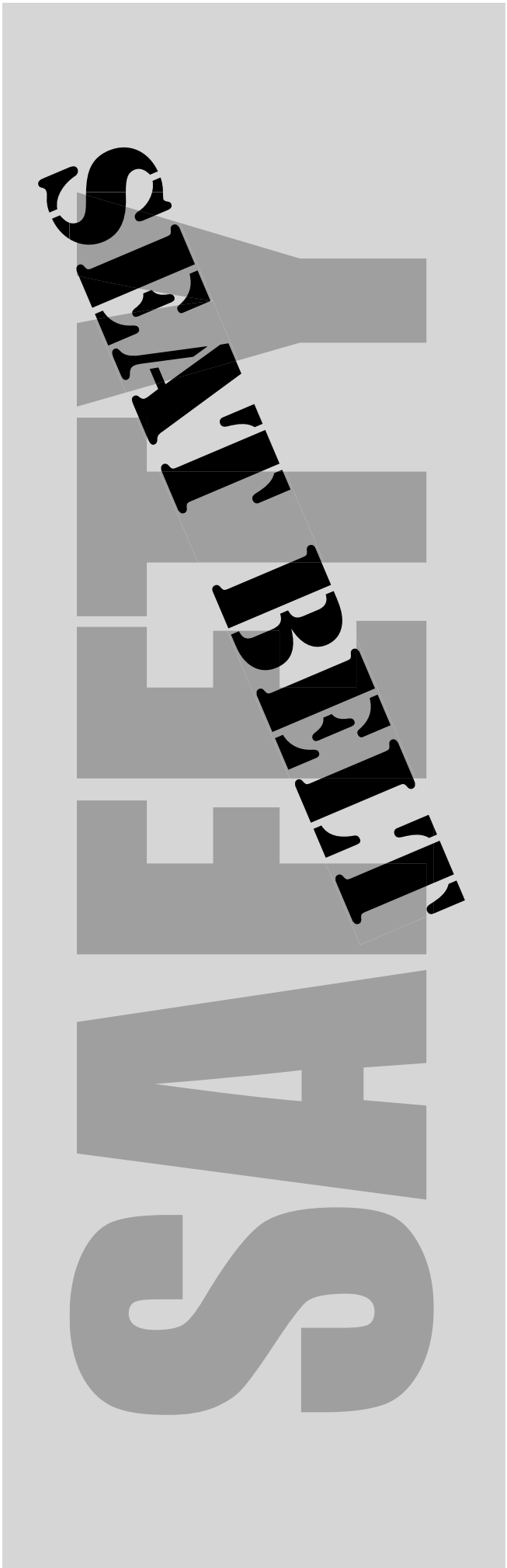
Photo gallery: Old Times to New Times

OLD and...

New

OLD and...

New



"It Wasn't Going That Fast..."

The Danger Of Neglecting To Wear Seat Belts On Slow Moving Equipment In Seemingly Safe Areas

By Ronald Medina

Ronald Medina is a Mechanical Engineer and works in the Mechanical and Engineering Safety Division of MSHA's Approval and Certification Center, located near Wheeling, West Virginia.

We all know that wearing seat belts is important, yet injuries and deaths continue to occur at mines because seat belts have not been worn by equipment operators. Working for MSHA, I have helped investigate a number of fatal mining accidents over the years and have seen many instances where the equipment operator clearly would have survived if the seat belt had been buckled. So, why do some people fail to wear the seat belt? No doubt there are many reasons; one reason could be that when operating equipment at a slow speed while in a seemingly safe area, it may not appear to be necessary to buckle the seat belt. This may have been a factor in two fatal accidents I helped investigate. Both occurred when slow moving equipment unexpectedly overturned and trapped the operator under the machine. One accident involved a dozer and one involved a forklift truck.

Fatal dozer accident – The first accident occurred while a Caterpillar D6D bulldozer was preparing a pad area for a water pump (figure 1). The pad was located next to an access road having a 13% grade. While leveling out the pad area, the dozer rolled over onto its left side and the operator was pinned between the Rollover Protective Structure (ROPS) and the ground.

The cause of the rollover was not immediately obvious when we arrived at the accident site. It seemed surprising that a slow moving dozer

Figure 1. The dozer overturned when the right side track traveled over a partially buried rock

would overturn on a 13% grade. A closer look showed why the dozer overturned. Among the numerous smaller rocks in the area was the tip of a much larger rock that protruded from the surface. Most of this large rock was buried so its size was not apparent to the dozer operator. When the dozer moved forward, the right side track rode up on the large buried rock rather than pushing it into the ground. This action lifted the right side of the dozer and with the left track on the lower side of the 13% grade; it sank into the softer material. The combined effect flipped the dozer onto its left side, throwing the operator to the ground where he was pinned under the ROPS. The pad area was more dangerous than it may have looked at first glance. The investigation team agreed that the operator would have survived this accident if he had worn the seat belt.

Fatal forklift accident - The second accident occurred at a preparation plant where a mechanic was operating a 6,000 pound capacity Toyota forklift truck (figure 2). He was on his way to pick up an electric motor in a nearby warehouse and was traveling on a dry and level paved road during daylight hours. The forklift truck had a maximum speed of 12 mph. Witnesses said the forklift truck was traveling at approximately 6 mph in the forward direction when the accident occurred. The mechanic was familiar with the forklift and had operated it on a regular basis for nine years.

The accident occurred when the machine's left side tires went off the edge of the roadway onto the gravel shoulder which was nine inches lower than the roadway. This was enough to overturn the forklift truck onto its left side which threw the operator onto the roadway where he was pinned under the front-left post of the Falling Object Protective Structure (FOPS).

Figure 2. The forklift overturned when the left side tires traveled onto the shoulder

The seat belt was not being worn by the operator. The accident investigation team determined that the belt had not been used for some time given that the latching mechanism did not operate properly and it could not be buckled. However, it is believed that use of the seat belt would have saved the mechanic's life. The level, dry, paved roadway may have looked like a safe area to operate the forklift, but the 9-inch drop-off from the road to the shoulder was enough to cause the rollover and fatality. The need to wear a seat belt on this slow moving machine may not have appeared to be necessary until after the accident.

Similar fatal accidents - Other accidents involving slow moving equipment and operator's failure to wear seat belts have been investigated by MSHA. For example, a skid steer loader was involved in an accident while dumping over the edge of a level area into a grizzly for coarse screening (figure 3). A stop block was located at the edge of the dump point. The accident occurred when the skid steer loader traveled over the stop block and landed on the grizzly. It overturned and landed on its wheels, falling a

(See next page)

vertical distance of 16½ feet. The operator was not wearing the provided seat belt, was ejected from the machine, and was fatally injured. The high-low travel speed control was mechanically locked into the low speed position which limited the maximum travel speed to 7.7 mph. However, this speed limiting action was not enough to prevent the accident.

Figure 3: The skid steer loader traveled over the top of the grizzly and landed on the ground below

Another fatal accident occurred when a forklift truck, working at a dimensional sandstone mine, overturned while traveling on an elevated mine roadway (figure 4). The roadway had been constructed with earth and waste rock and was four feet high. After running over a protruding rock in the roadway, the truck overturned at the elevated edge. The operator was thrown from the machine and pinned under the FOPS. The forklift truck was not equipped with a seat belt. Self-propelled mobile equipment equipped with FOPS, operating at metal and nonmetal mines such as the one above, are not required to be equipped with seat belts. However, a best practice would have been for this machine to have a belt installed.

Figure 4: The forklift truck overturned while traveling on an elevated mine roadway.

MSHA requirements - MSHA requires bulldozers at coal and metal and nonmetal mines to be equipped with seat belts and also requires seat belts on skid steer loaders at metal and nonmetal mines. Skid steer loaders at coal mines are required to be equipped with seat belts where there is a danger of overturning and where roll protection is provided. MSHA does not require FOPS equipped forklift trucks, used at coal mines or metal and nonmetal mines, to be equipped with seat belts. However, a best practice would be to install and use the seat belt on all equipment whenever a potential for overturning exists.

Fasten the seat belt - The hazards of operating slow moving equipment without wearing a seat belt may sometimes not be obvious to an operator and they may neglect to wear the seat belt. Rollover accidents on slow moving equipment emphasize the need for equipment to have seat belts installed and for operators to always fasten the provided belt.

It's That Time Again – A Quick Guide to Lawn Care

By Steve Hoyle

Mowing the lawn is one of those things we "have to do," usually when we would much rather be doing something else. Here are some hints and tips on lawn care.

Before you start, make sure that your mower's blade is sharp. A dull mower blade can really damage your lawn by shredding the grass blades. Shredded grass dries out quickly and can be subject to different plant diseases.

Adjust the blade height to the kind of grass you have. Remember, you don't want to cut the grass too short; experts suggest you remove only about 1/3 of the grass blade height when you mow.

Cutting Height
Kentucky bluegrass – 2 1/2 to 3 inches
Bentgrass – 1 to 1 1/2 inches
Bermuda grass – 1 to 1 1/2 inches

Take care not to scalp your lawn when you mow. Scalping happens when you let the grass get too high and then mow it too short. Scalping stresses (and damages) grass plants. It can also allow weeds to flourish and plant diseases to occur.

Lots of homeowners worry about how often to mow. This varies according to where you live. For example, some grasses require more frequent mowing in the spring than in the summer and vice versa. Pay attention to when you mow as well. You don't want to mow during the hottest part of the day or in full sunshine. This stresses not only the grass but also your body. Experts suggest that it is better to mow when the grass is dry.

Finally, leave the clippings on your lawn after you mow. This reduces the time you spend mowing, saves landfill space and provides nutrition to the soil.

Check out these websites for more information.

MSHA does not endorse information found on external websites.

http://www.allabouthome.com
http://www.allaboutlawns.com
http://www.american-lawn.com
http://www.lawn-care-tips.com

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Clearwater, Florida

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1100 Wilson Blvd. Rm. 2147
Arlington, VA 22209-3939
Tel: 202/693-9574, Fax: 202/693-9571
E-mail: rhea.robert@dol.gov

Please address any comments to:
Steve Hoyle
Joseph A. Holmes Safety Association Bulletin
DOL-MSHA
National Mine Health and Safety Academy
1301 Airport Road
Beaver, WV 25813-9426
Tel: 304/256-3264, Fax: 304/256-3461
E-mail: hoyle.stephen@dol.gov

Reminder: The District Council Safety Competition for 2006 is underway—please remember that if you are participating this year, you need to mail your quarterly report to:

Mine Safety & Health Administration
Educational Policy and Development
Joseph A. Holmes Safety Association Bulletin
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