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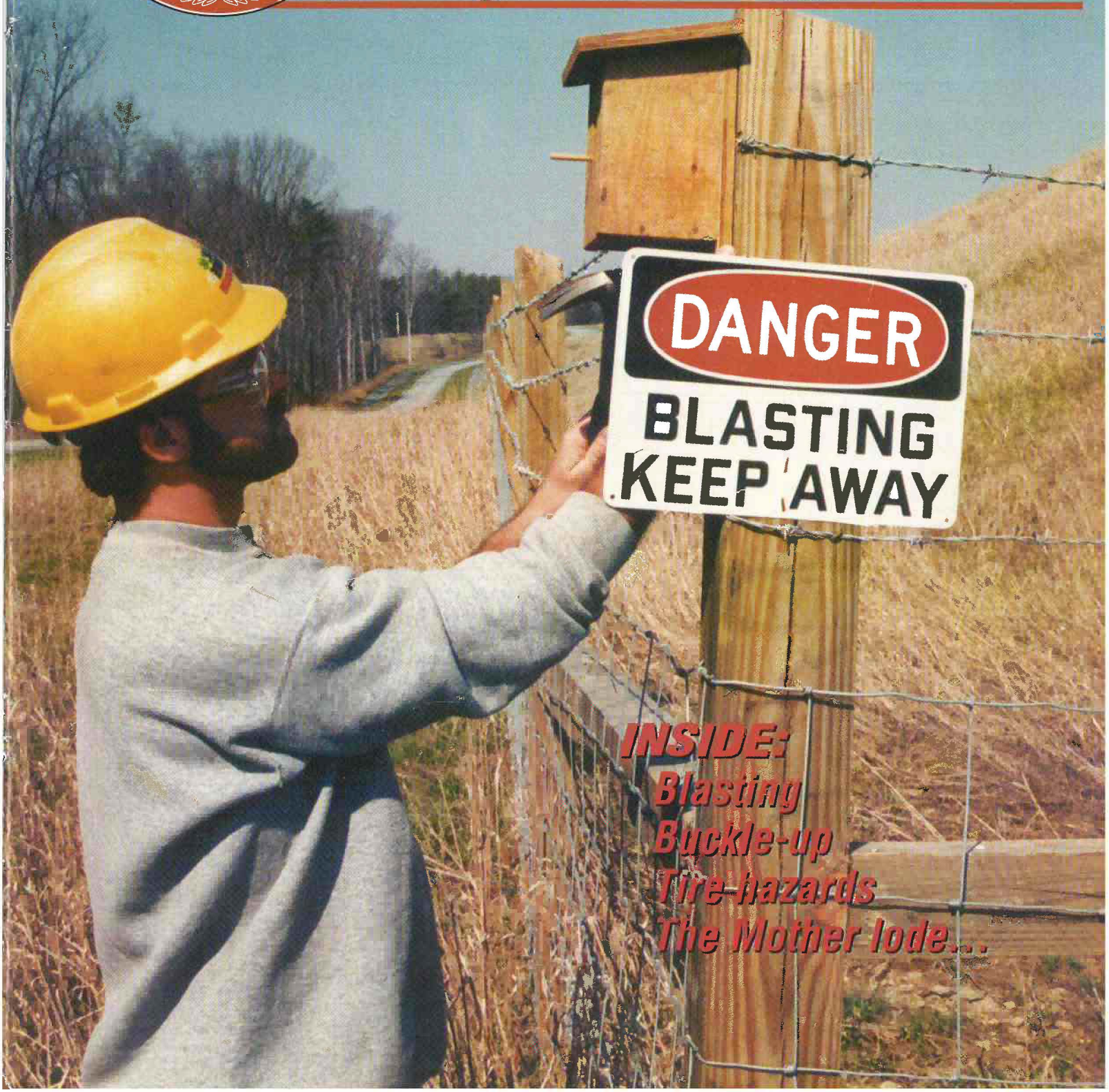
SAFETY EFFICIENCY

MINERAL INDUSTRIES

BULLETIN

May-June 1996



INSIDE:

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contents:

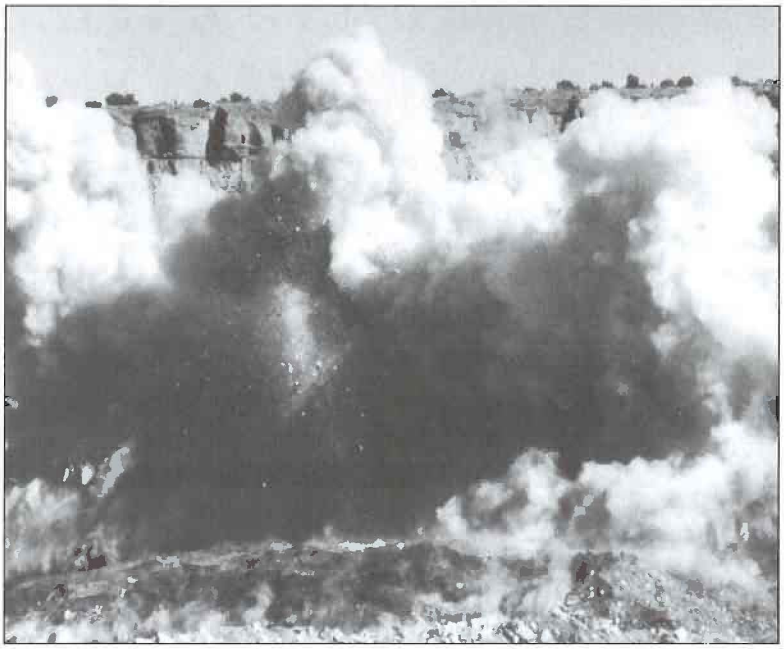
The *Holmes Safety Association Bulletin* contains safety articles on a variety of subjects: fatal accident abstracts, studies, posters, and other health and safety-related topics. This information is provided free of charge and is designed to assist in presentations to groups of mine and plant workers during on-the-job safety meetings.

PLEASE NOTE: The views and conclusions expressed in *Bulletin* articles are those of the authors and should not be interpreted as representing official policy or, in the case of a product, represent endorsement of the Mine Safety and Health Administration.

THIS MONTH'S COVER: Sincere thanks to Scott Gordon for this super photo showing the installation of wren houses along perimeter fencing at the Luck Stone Fairfax Plant. This is one of the many efforts that Luck Stone takes to encourage the growth of the wildlife habitat. Scott submitted three photos for possible cover use—all three will be used. Thanks also to MSHA inspector, Benny Lara, whose photo will appear in an upcoming issue.

KEEP US IN CIRCULATION
PASS US ALONG

Operator is responsible for "primary enforcement" of blasting and explosives laws and regulations, not the inspectors



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◀ The detonation of explosives at a surface metal mine sends rock fragments flying. Because "flyrock" has caused deaths and injuries and has destroyed property, careful attention must be paid to clearing people from areas some distance from the blasting site and observing good warning procedures.

By: Jim Ludwiczak, President, Blasting and Mining Consultants, Inc., 1801 Bonnie Castle Dr., Owensboro, KY 42301 502-683-7222

There seems to be some confusion as to who has the "primary enforcement responsibilities" of the laws and regulations governing blasting operations and the use of explosives. There are many who feel that the inspectors (if they do their jobs) will ensure compliance. However, is it the responsibility of the operator (blaster), or the agencies regulating the operation, to keep the company within compliance?

This question, or problem, almost always seems to arise when working with blasting damage suits, and blasting or explosives, related accidents. Upon a review of blasting records, permits, waivers, approved designs, required warnings, and other requirements, it is found that the required material was not complied with by the operator. The main excuse, or reason, for the lack of compliance is: "the inspector inspected the operation, and paperwork, and did not write any violations or tell us we had to do anything, so I thought everything was Okay." However, in the same breath they will comment that "the inspectors don't know what they are doing, and are just in the way". Obviously, they can't have their cake and eat it too. The operator must realize that this is especially true with laws regulating blasting and use of explosives. Many of the enforcement agencies are not "experts" in the field of blasting and use of explosives. In fact, most regulators actually "borrow", or learn, their expertise, or knowledge, from the blasting industry they regulate. To compound the problem, the inspectors usually have only regulatory expertise (are not blasters), and can only apply the legal requirements under their jurisdiction. This means that contradicting requirements (not under their control, and unknown to them) are of little, or no concern, to their enforcement practices.

While inspectors are required to inspect for compliance with laws and regulations, one cannot expect them to do the work for the operator. This is especially true with use of explosives and blasting requirements. Any attempt to "blame" the inspectors for not discovering a blasting-, or explosives-related violation is foolish. It will also demonstrate that the operator does not have the knowledge, experience, or has made an effort, to comply with the necessary requirements governing **their** blasting.

Unwritten violations may not be a problem until a blasting accident, complaint, claim, or lawsuit, is made. Then you can rest assured that the entire blasting program will be the target of numerous detailed inspections. Even if the violations are not contributory to the specific problem, they will indicate the lack of care exhibited by the operator. You can bet that this will have an effect on the assessment of fines, jury and court decisions, and effect the amount of punitive damages awarded.

Keeping your blasting, and use of explosives operation, legal is the responsibility of those conducting the operation, not the regulators.

Real case of safety at work in the mines...

A different point of view

By Jim Ball, Bradford Stuart Industries

Mining is a tough business filled with great expectations and heartaches. It's a business that has no equal when it comes to pride and satisfaction or no equal when it comes to danger. In the twenty or more years that I have been in this business, I have seen many changes. There was a time when it was said that solid state electronics would never be in the mining industry. Today you will find that the average superintendent keeps track of production, maintenance and his payroll with a computer. This is a far cry from the days not so long ago when we used to haul coal out with the old mule.

The question that we may ask of ourselves is "is this industry advancing or in a point of stagnation. "If we look at all the records compared to the past, we will find out that today's miner produces more coal, metal, or non metal products than at any other time in history. This is done with few accidents and with a more educated and adequately trained miner than ever before.

What does all this technology and training mean to the average person. I think that if we would take a few moments to peer back into our pasts and remember, we will all know of someone that has been lost to this industry. This loss is felt far greater by the immediate loved ones left behind, but it also has a lasting effect on all our lives. This industry is dangerous but certainly not as dangerous as it was in days past. In the past 16 years, I have been involved in companies that manufacture electronic equipment for the mining industry. I would have to say that the majority of these electronic gadgets, gismos, or real products have had safety as the guiding light for their development. Certainly more than a few have been guided by MSHA through their years of experience and study of this industry.

One thing that bothers me is that we have a tendency to complain about laws or products that assure our families that when we leave for that shift, we will be returning safely. I think that we should start thinking more in terms of how safety has helped, instead of lost-time accidents or fatality reports. I am not saying that we should forget about accidents, but think of safety in terms of our every day lives and how technology and some rules have helped us. I would like you individual miners, companies, or inspectors to have a different view of our industry. I think that we could start focusing on how people have been saved by laws as well as technology.

Why not see reports where someone was saved or not injured, because of technology. I would like to start the ball rolling with a story that has stuck in my mind for many years. I will not mention the actual name of the company or individuals involved. I would like this story to be viewed in the "someone saved" aspect of thinking.

I was working on a project with a company installing a new ground monitor. The purpose of the ground monitor is to assure that the ground conductor stays intact at all times while electrical equipment is operating. If this ground wire is broken, the electrical circuit must be de-energlzed. We had installed this device and had met with the usual resistance about technology, laws, and other things. We were even told by one fellow that this new device was not safe. The system had been in operation for a while and one day they needed to do some maintenance on the junction boxes. Two electricians had the circuit de-energized and proceeded to work on different boxes. One electrician was around a hill from the other electrician and could not be seen. The first electrician completed his task and called to say that he was finished. Someone at the substation thought that this was an okay to put power back on. He energized the circuit and it tripped as soon as he energized it. The electrician that had finished realized what happened and told them not to energize the power. He ran to where his buddy was working. His buddy had been in the box with a crescent wrench on a phase conductor when the power was energized.

There is a happy ending to this story. Before the electrician had started working on the box, he disconnected the ground wire and used it to bleed the capacitance from the system. He then left the ground wire disconnected and started working on the box. When the circuit was energized the ground monitor immediately

tripped the circuit out. The only thing that happened to this individual was a couple of red spots on his knees, where he was touching the box. He was sent to the hospital and released in short order.

In this case, if we had not had a ground wire monitor or ground monitoring laws, we would have another family without a husband or father. The next time you wonder about those new high tech gadgets or gismos or all these laws, try to think of this story for the answer.

Reprinted from the MARCH 1996 issue of ***COAL PEOPLE MAGAZINE****, Vol. 20, No. 7, copyright 1996 by Al Skinner, Editor/Publisher.*

High tech for drilling and blasting

One of the most widespread software companies supplying analytic programs for drilling and blasting is MINEsoft, Ltd. of Lakewood, Colo.

Marketing its ore-reserve analysis computer programs to "the world" says programmer-technician, J.O. Williams, means the firm's software is particularly used in mining operations in Russia, Mongolia, China, India, and South America—especially Chile. Coal, copper, and other minerals are analyzed by the company's programs after the ore is drilled or blasted. Williams did not know the percentage of coal analysis among its sold computer programs, but he referred questions to MINEsoft's president who was unavailable in early June.

MINEsoft's DATCOL trademarked "barcode logging software" speeds logging of rock and soil samples using hand-held terminal or laptop computers with a voice recognition system to find errors and end double handling. Their TECHBASE registered brand of "engineering database manager" uses statistics, interactive graphics, geostatistics, modeling, mine design, unlimited storage capacity, large data files, and "increased productivity."

MINEsoft, Ltd. can be reached at 303-980-5300, fax: 303-969-0022; or write 165 South Union Blvd., Suite 510, Lakewood, CO.

News on the coal industry

The congressional General Accounting Office on June 1 [1995] briefed Tennessee Valley Authority officials about a long awaited year-long GAO audit. GAO's draft report says TVA's coal-fired and hydro units total only 19% of TVA spending while coal/hydro produces 86% of the seven-state federal utility electric power. Fully 69% of the expenses were nuclear—while nuclear units produced only 14% of TVA's power.

Apparently anticipating the GAO contrast report. TVA board chairman Craven Crowell on May 31, [1995] announced a TVA study and plan to convert the Bellefonte nuclear plant near Hollywood, Ala., and other nuclear units to fossil fuels—coal or natural gas—by the year 2020.

Immediately better for TVA and 137 Peabody coal workers, the Henderson, Ky.-based Peabody Coal Company reached a new pact with TVA to keep supplying 1.5 million coal tons yearly to TVA's Paradise, Ky. plant. Peabody's Martwick Mine near Central City in western Kentucky was at risk of losing its sole coal buyer, TVA, after the agency said the contract would end due to labor costs.

Peabody Coal, part of Saint Louis-based Peabody Holding Company and United Mine Workers union officials said Maltwick Mine productivity will increase while cutting costs. Lauding the new TVA-Peabody contract, Peabody Coal president Frank Dunham issued a statement that management and labor "must continue to make positive changes in order to continue operating in today's intensely competitive midwest coal market."

Though neither Dunham nor UMW District 23 president Richard Litchfield would give contract details, including worker concessions, Litchfield praised his UMW Martwick workers for "their willingness to make changes in order to be competitive."

Other coal cooperation is Peabody Holding Co.'s Eastern Associated Coal Corp. of Charleston, W.Va. cooperating with the West Virginia Highway Dept. in building a train overpass over Route 85 in Boone County. Eastern Associated's $1.2 million contribution and federal matching funds [will eventuallu] speed local vehicle traffic to and from the Rocklick Preparation Plant. Its coal highway flow was blocked periodically by freight trains.

Foy McDavid is editor of ***County Newsletter*** *in Knoxville, Tennessee.*

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Improved visibility for operating large haulage equipment

By C.M.K. Boldt, Civil Engineer, Spokane Research Center, Spokane, WA

The U.S. Bureau of Mines (USBM) has been solving problems in surface mine haulage safety for almost as long as it has been around (100 years). The old adage of "Been There, Done That" is very true. However, the more things change, the more they stay the same. We're still digging ore out of the ground. But now it's with million-pound (loaded weight) haulage trucks, satellite uplinks, and microchip maintenance. What was science fiction 10 years ago is commonplace today. So, when I say that 20 years ago, haulage truck visibility tools like mirrors and cameras were studied by the USBM, maybe it's time to look again.

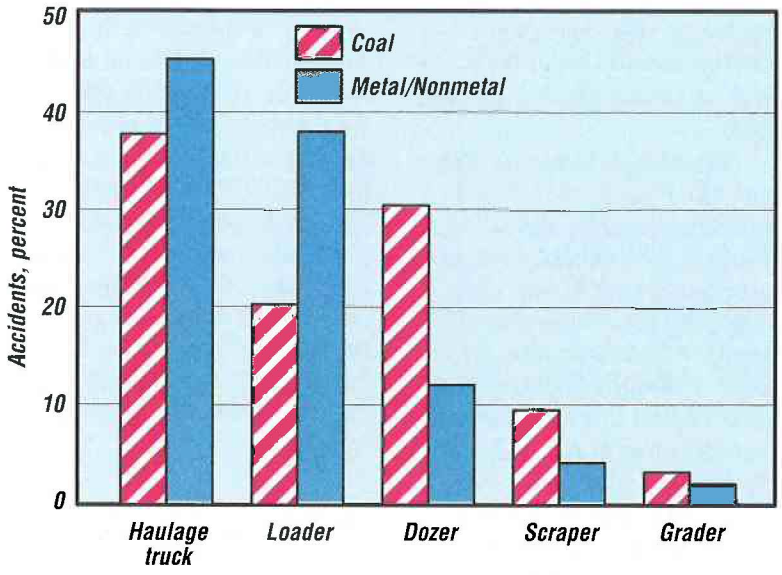
Introduction

Powered haulage has been, and continues to be, the major source of severe accidents and fatalities in surface mining. From 1972 through 1974, truck haulage accidents were the leading cause of fatalities at metal and nonmetal surface mines (Miller, 1976). Figure 1 illustrates that from 1989 through 1991, accidents involving surface mine haulage trucks accounted for the greatest number of accidents with the most severe injuries and fatalities (Aldinger, 1995). The latest preliminary accident statistics from MSHA indicate that over 33% (again, the largest single category) of the 1995 fatalities were attributable to powered haulage.

This article summarizes past USBM research and currently available technologies pertaining to mirrors and video cameras for blind area viewing on large surface haulage trucks. After abolishment of the USBM in 1996, some of the health and safety research functions were continued—the project on surface mine hazard reduction is presented here.

Although this article highlights safety tools for large haulage trucks, there is no substitute for a dynamic safety program which includes proper preventative maintenance and safe driving.

Figure 1.—Accidents during surface mine mobile equipment operation, by equipment type (from Aldinger, 1994)



Background

In 1995, the USBM presented an overview of the research conducted in surface haulage safety (May, 1995). Excerpts from this Blacksburg, VA conference paper are presented here along with references for the reader's convenience. Not all research topics are given in this article. For a complete summary, it is suggested that the reader obtain a copy of the May report.

In 1977, the USBM published recommendations for haul road design and construction, taking into account haulage truck size, road alignment, construction materials, cross slope and drainage design, runaway vehicle safety provisions, etc. (Kaufman and Ault, 1977). Associated with this effort was the design and construction of berms and runaway vehicle protection measures. In the 1980s, several techniques to stop runaway trucks were evaluated. These included road berms, guardrails, boulders, concrete barriers, center safety berms, and escape lanes. Follow-up studies on escape lanes and center berms were then evaluated and construction techniques documented (Hays, 1983).

In the late 1980s, active collision avoidance systems using radio transmitters and receivers were field tested (Griffin, 1988). In these systems, the transmitter was installed in the smaller vehicle, in this test case, a pickup-

sized truck. The receiver was installed in 130- and 170-ton haulage trucks. The premise was that the transmitter would trigger an audible and/or visual signal in the haulage truck when it was within a 30-foot radius. There were problems with false alarms triggered by the mine communication system, the truck's electrical system, and other outside bodies, such as berms and passing vehicles. Recommendations were made to improve the system.

More recently, in 1995 the USBM concluded studies evaluating two technologies capable of monitoring the position of a vehicle in relation to a potential hazard such as a road edge, highwall, dump point, or other mining equipment. These technologies were (1) radar positioning with dead reckoning and (2) a differential global position system combined with dead reckoning. The radar system had an accuracy within 3.5-meters, which was not deemed sensitive enough for positioning the vehicle in relation to hazards. The global positioning system tested was accurate, but could not relay the information within a target time frame of 1 second. There are other systems now on the market that were not available at the time and that claim to have the accuracies needed to meet the objectives of the project. This technology may be pursued in the future with continuing health and safety research.

Blind area viewing aids

For a while, bigger was better in surface haulage. The bigger the machine, the more it could haul. The more it could haul, the better the production numbers. The statement has now been made that bigger is better only if bigger *is* better. There comes a time when the sheer size of a piece of equipment exceeds the limits of the infrastructure (such as haulage road widths), loader configurations, and maintenance costs. One of the newest behemoths on the mine haul market today is a 300-short ton (st), two-axle, rear dump truck. At 24 feet high and a little over 50 feet long, it has a gross vehicle weight of 1.1 million lbs.—as compared to an empty DC-10 jetliner at 244,000 lbs. The payload is 300 st, but the truck dimensions are comparable to smaller capacity 240 st trucks. This engineering feat of increasing the payload by minimally increasing truck dimension is welcomed not only for its efficiency in using existing mine resources, but also because the truck operator is not blinded a quarter of a mile around.

Although the 300-st truck is considered an "ultra class," all mine haulage trucks are large and heavy, and operate in less-than-ideal weather and geotechnical conditions. The extensive blind areas of such trucks have been documented years ago (MB Associates, 1978). These blind areas are dependent on the size of the truck, position of the operator, obstructions, and modifications obscuring the operator's vision, etc. Figure 2A is a generalized look at the blind areas around a rear-dump haulage truck. A 6-foot tall person will not be seen by the driver of a 150-ton haulage truck within 70 feet from the right side of the truck and ground level is not visible for 105 feet.

Between 1976 and 1981, the USBM contracted studies to improve the visibility system for large (100+ ton) haulage trucks in surface mines (MB Associates, 1978; Tracor MBA, 1982). The components designed and tested were a flat-planed, left-hand driver's mirror; a right-hand, rectangular, 30-in radius convex mirror; a right-front-mounted Fresnel lens blind-area viewer that allowed the driver to see the right front side of the truck; and a closed-circuit television for viewing the rear of the truck. Modifications were made to all the units after laboratory mock-ups and in-mine testing. The units were installed on 150- and 170-ton haulage trucks at three different mines for year-long durability testing. At the end of the test period, the contractor concluded that left-hand mirrors were already widely used in the industry, and, therefore not necessary to pursue the topic further. The blind-area viewer with a night light for night dumping was well liked by the drivers and was offered commercially. The right-hand, rectangular convex mirror seemed to work better than what was available in the mines at the time, namely, a round convex mirror. Mirrors could not give drivers a view directly to the rear of the truck. However, the components of the closed-circuit television camera (particularly the automatic iris) were not rugged enough to withstand the mining environment.

Today, many large haulage trucks are equipped on the driver's side with flat plane mirrors with a small convex mirror that enlarges the field of vision. As with all mirrors, though, their durability under loading and off road haulage is still a problem. Manually adjusting mirrors to suit the individual drivers' field of view has also been known to cause breakage. An electronically adjustable left-hand mirror has been used at one mine to reduce the need for mirror replacement. The most common right-hand mirror configuration is the rectangular, convex mirror. Since it is usually used only to check the right side of the truck for

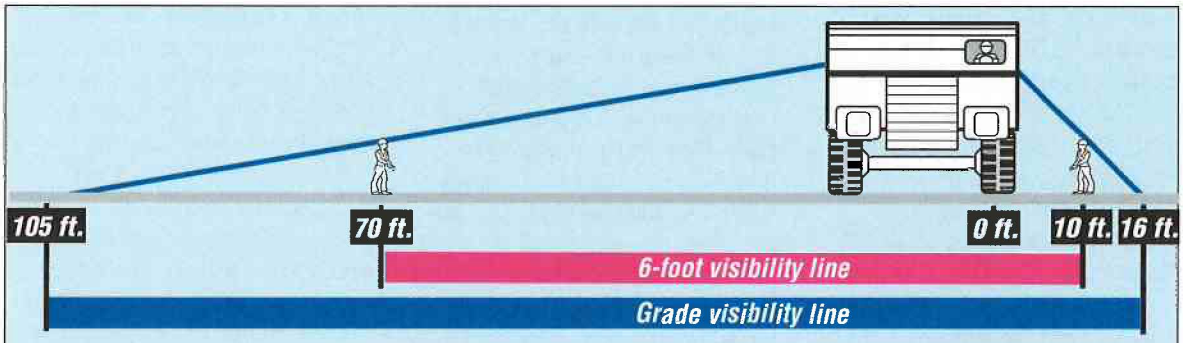


*Figure 2A.—Front view of vision limitations from the cab of a 150-ton rear-dump truck**

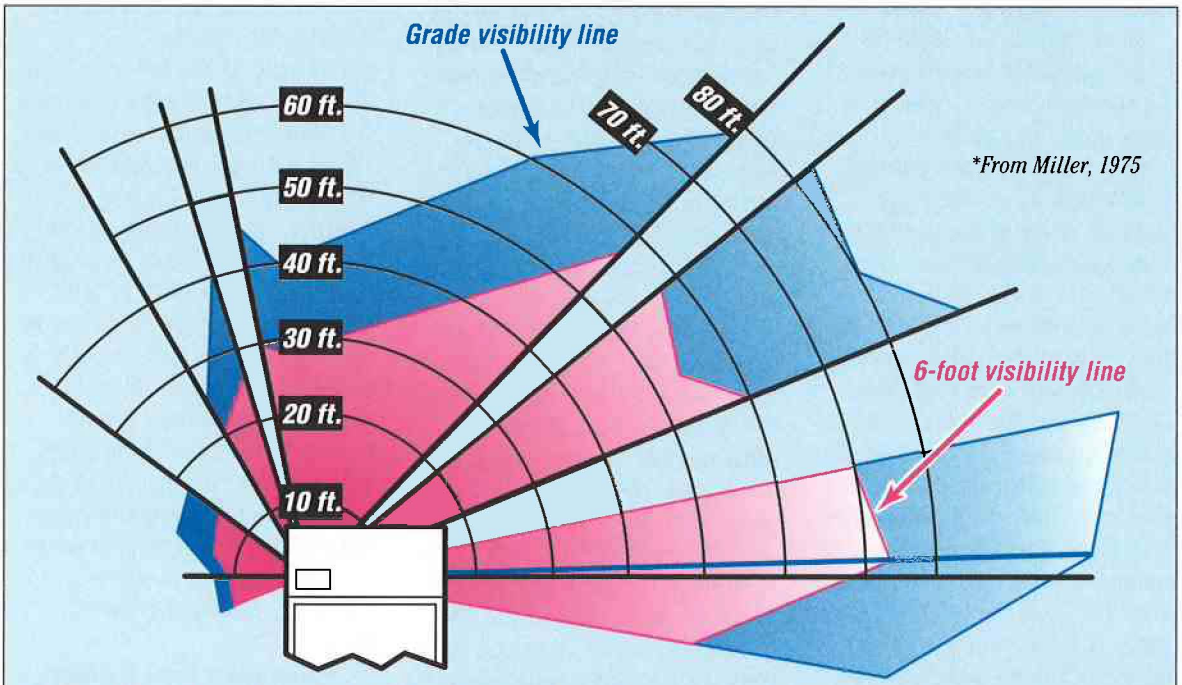


*Figure 2B.—Plan view of vision limitations from the cab of a 150-ton rear-dump truck**

obstructions before moving, the reduced size of the image on the convex mirror is not critical, but improvements can still be made.

Currently, surveillance cameras are used to give back-up warnings on top-of-the-line recreational vehicles, utility trucks, and municipal refuse trucks. Some video cameras designed for surveillance claim to have shock and vibration ratings of 9 G's. This specific camera has a minimum illumination requirement of 0.3 lux, the widest field of view (127° horizontal by 100° vertical), an automatic shutter that covers the lens when not in use, and black-and-white monitors rated to withstand 4.4 G's.

In 1995, the USBM had completed initial shock tests on various machines in a surface mine to study the effects of vibrations on driver fatigue and health. Self-contained field recorders were installed on the smaller sized equipment typical of quarries: a 35-ton haulage truck, a 7- to 8-cubic yard bucket capacity front-end loader, and a bulldozer. These field tests were conducted in a limestone quarry under actual working conditions. The haulage truck's peak acceleration recorded 11 G's on the cab floor during the first pass at loading. The bulldozer recorded over 23 G's, and 8 G's were recorded for the front-end loader. These peak shock loads indicate that video cameras may still have a problem withstanding the mining environment. However, further tests are warranted to field test the cameras and monitors on today's larger equipment under shocks and vibrations found in mine conditions.

Radar is being used to provide warnings to a driver about obstacles during backing opera-

tions. Currently, these systems are being used on some commercial vehicles, motor coaches, and is being used at one mine for proximity warning. They are also being tested on highways to promote collision avoidance, especially where one vehicle is closing on another. Improvements in radar sensing are leading to the point where the technology can be used in mud- and ice-caked conditions. These concepts are being pursued by industry, academia, and government research laboratories.

Current status of surface mine hazards reduction efforts

Although the USBM was abolished by Congress in 1996, the Health and Safety research program in Pittsburgh, Pa., and Spokane, Wa., were transferred to the Department of Energy, and according to administration plans, in 1997, will continue within the National Institute of Occupational Safety and Health, an agency within the Department of Health and Human Services. The project, "Hazard Reduction for Surface Mining," is continuing to build on past accomplishments while re-focusing future goals to meet the health and safety needs of the mining industry. The objective for the project is to reduce accidents and injuries associated with coal and metal/nonmetal surface mining.

MSHA provides extensive training support and visual aids for safety training. Much of the development of training materials has been done by the USBM and continues through the mine health and safety research of the Pittsburgh and Spokane centers. Relevant topics pertaining to large surface haulage equipment can be requested from the National Mine Health and Safety Academy, P.O. Box 1166, Beckley, W.Va. 25802-1166, telephone (304) 256-3257.

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Supplies in mantrip figured in accident

A fatal powered haulage accident illustrates why underground employees should not carry mine supplies with them in the mantrip.

A worker at Sand Branch Mining Inc., in Mingo County, W.Va., was killed last September when his head was caught between the mine roof and the sled or a bag of rock dust being carried in the vehicle, MSHA reported.

Two factors loomed large in the death of Morgan Tabor, a shuttle car operator at the coal mine.

The accident occurred because the curved ends of the sled runners were broken off. "The accident occurred when the broken right sled runner struck a loose rock in the mine floor causing the sled to lift toward the mine roof when the rock fouled and overturned," the report issued through MSHA District 4 stated.

Also the bags of rock dust being transported in the mantrip sled reduced Tabor's overhead clearance. Tabor "was lying on four 50-lb. bags of rock dust in the right front corner of the mantrip." One bag of rock dust was placed against the end sideboard in an inclined position and was being used by Tabor as a back or head rest.

"The other miners were positioned lower inside the sled," MSHA reported. The mining height at the accident site was 46- to 50-inches.

A 104(a) citation was written stating the mantrip was not maintained in a safe condition in violation of 75.1725(a). Also a 314(b) notice to provide safeguard was issued, stating in part that supplies were being transported in the sled with miners.

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Case studies in small mines accident analysis: Kentucky, Virginia, and West Virginia

Doris Ann Cash, Mining Engineer, MSHA, Technical Support

This article is the final part of the series covering Kentucky, Virginia, and West Virginia. In this, the third part, accident tallies were used to create an accident profile for ***West Virginia.***

Background

As part of the initiative to accurately identify safety and health problems in small mines, an analysis was made of the accident and injury data for each of three states: Kentucky, Virginia, and West Virginia, for the size group 1-19 employees, for underground coal mines including the surface areas. The final Part 50 data for calendar years 1990-1993 and the preliminary Part 50 data for 1994 were used. Accident classifications were grouped into categories as follows:

These four categories had been previously identified as having the highest incidence rates and/or frequency of occurrence.

Category	Classification
Roof falls ...	Entrapment
	Falling, rolling, or sliding rock or material
	Fall of face, rib, side, or highwall
	Fall of roof
Haulage	Nonpowered haulage
	Powered haulage
	Hoisting
	Unstable condition of impoundment, refuse pile, culm bank
Machinery ..	Machinery
Materials ...	Handling material

Contractor injuries were included with operator injuries. The specialists in the Small Mines Unit tallied the degree 2 through 5 injuries by the occupation of the injured employee, the activity at the time of injury, and the location at which the injury occurred in underground mines for the five-year period in all four accident categories. Degree 2 through 5 injuries are usually referred to as Non-Fatal, Days Lost (NFDL) injuries, or "disabling injuries." The accident tallies were used to create an accident profile for the size group 1-19 employees for each state examined. In this series of articles, some of the findings for each state will be discussed.

West Virginia:

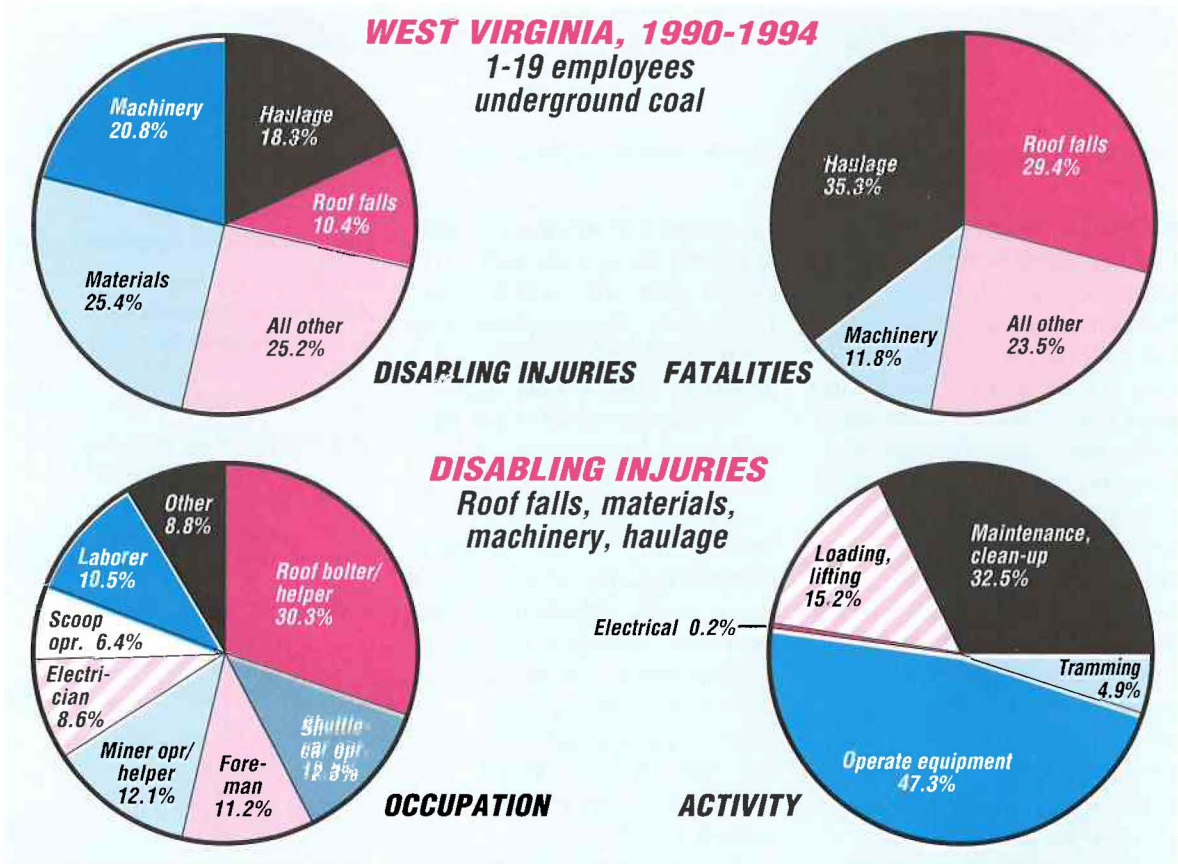
During the five years examined, about a fourth of the disabling injuries occurred in a category other than the four selected for analysis. The disabling injuries in those four accident categories—haulage, machinery, handling materials, and roof falls—also comprised over half of the total number of injuries. There were 17 fatalities in the 1-19 employees size group during that time. Composites of the fatalities show that in West Virginia a much lower percentage of the fatalities are roof falls than in either Virginia or Kentucky. Roof falls comprise about 30% of the fatalities, and they account for slightly more than 10% of the non-fatal, days lost (NFDL) injuries. More than a third of the fatalities were in haulage. A quarter of the disabling injuries occurred in handling materials, but no fatalities.

Composites of the four accident categories show the occupations and activities at the times of injuries. The roof bolter or helper was injured in about 30% of the NFDL injuries over the five-year period. Continuous miner operators/helpers and shuttle car operators both received about 12% of the disabling injuries. In these composites, the category "other" includes beltmen, shotfirers, and all other occupations not named elsewhere on the chart.

Nearly half of the disabling injuries occurred while the employee was operating equipment. About a third of the disabling injuries were attributed to maintenance and clean-up activities. A composite of the locations the accidents occurred revealed that 35.5% of the NFDL injuries took place at the face and 38.8% at outby locations. Only 1.4% of the disabling injuries occurred on the surface areas of underground mines. The remainder of the injuries, 24.2%, occurred on a road, belt, or face haul.

The number of NFDL injuries was cut by almost 39% over the five years examined. The decline has not been steady in any given occupation. For example, in each of the five years examined, roof bolter/ helper was the occupation with the most numerous disabling injuries, but by 1994, NFDL injuries to roof bolters/helpers were a third less than the number of injuries in 1990.

Year by year and composite charts of each of the accident categories were also constructed by occupation, activity, and



location. In the accident category "materials handling," where over a third of the disabling injuries occurred, more than a fifth of the disabling injuries were experienced by laborers. In descending order of frequency, the occupations with the greatest number of disabling materials handling injuries were roof bolter/helper, electrician, and foreman. Thirteen percent of the injured were foremen. Loading and lifting activities were responsible for 41% the NFDL injuries in materials handling. Maintenance activities were involved in another 43% of the disabling materials handling injuries. Only 3% the disabling materials handling injuries happened on the surface. The remainder were divided almost evenly between face haulage and locations outby.

In every year examined, the majority of disabling haulage injuries occurred while operating equipment. Nearly a quarter of the disabling haulage injuries were experienced by shuttle operators. Foremen and "other" each had almost 15% of the NFDL haulage injuries. Although the decline has not been steady, disabling haulage injuries decreased from 30 in 1991 to 20 in 1994.

Machinery accidents declined by 60% over the five year period. During the five years examined, roof bolters/helpers received two thirds of the disabling machinery injuries. Miner operators/ helpers were the next most frequently injured. The majority of the disabling machinery injuries occurred while the employee was operating equipment. In every year examined, the majority of disabling machinery injuries took place at the face.

Although progress was not steady, the number of NFDL injuries due to roof falls declined by 50% over the five year period. In four out of five years, the largest number of disabling roof fall injuries occurred while the employee was performing maintenance. More than a fourth of the disabling roof fall injuries were experienced by miner operators/ helpers. Roof bolter/helper and laborer each account for almost a fifth of the disabling roof fall injuries.

Production and hours both decreased by about 33% over the five year period in the 1-19 employees size group. This corresponds to the decrease of about 31% in the number of employees in that size group. In the state as a whole, the hours and the number of employees decreased by about 30%, and the production by about 6% during the same time period.

Continuous haulage systems

By Salwa El-Bassioni, Mine Safety & Health Specialist, MSHA, Coal Mine Safety & Health

Continuous haulage systems were first introduced to the mining industry in the late 1950s. However, they saw very limited use until the early 1970s. They were further perfected and became more commonly used in the early 1980s. The modern day versions have been responsible for dramatically increasing productivity, and are increasingly popular. Modern continuous haulage systems, known as mobile bridge conveyers, are either attached, physically connected to the continuous miner, or detached from the miner. The system consists of an alternating series of piggyback mobile bridge carriers (MBC) and chain bridge conveyers, and requires a rigid frame modular tailpiece (RFM) to be installed as an extension of the section belt conveyer. The system includes a dolly that slides over the RFM, and sometimes a mobile bridge carrier feeder-breaker as the inby unit of the continuous haulage system to size the mined material. The system is usually comprised of a number of MBCs and a number of bridge conveyers, one bridge behind every MBC. The number of units varies from 3 to 11 units depending upon mining requirements, entry/crosscut numbers, and the configuration of the area being mined. The required length of RFM tailpiece is at least the combined length of the system plus the continuous miner to allow for overrun of the dolly. MBCs provide the means to articulate the system around corners and move in concert with the continuous miner and other units in the system. On some systems, MBCs are equipped with an operator's cab designed to swing-out in order to provide the operator with greater safety and visibility of the full machine. Some operators' cabs are provided with canopies adjustable to the desired height.

Continuous miners used with continuous haulage systems are normally remotely operated, and each of the MBCs is usually operated from its own operator's compartment. Operators of MBCs can generally communicate with each other through a headset communication system, and the continuous miner operator usually communicates with the inby MBC operator using a physical signaling method (cap lamp or hand).

Continuous haulage systems are generally reliable, however, there are some concerns unique to the use of these systems. These concerns include:

- Lack of communication between the miner operator and operators of the MBCs and sometimes between MBC operators.
- Confined space around the system.
- Limited visibility of the MBC operators, especially the operator of the most outby MBC.

A review of accidents involving continuous haulage systems which occurred during the period 1985 to present, reveals that although only 4 fatal accidents occurred in this 11-year period, 181 nonfatal accidents have occurred in the last 5 years alone. The following is a list of these fatal accidents with a description of each incidence: It should be noted that some of these nonfatal injuries are serious and could be considered near misses. Therefore, it is important that continuous haulage systems be designed and operated as follows:

Date	Accident description	Injury
8/17/87	Victim trapped between machine and rib while tramming mobile bridge conveyer	Fatal
10/31/90	Employee operating MBC was struck in the head with 48-inch long piece of roof bolt drill steel	Fatal
8/28/91	Victim was injured from roof fall while operating the No. 3 MBC	Fatal
8/18/94	Victim was crushed between the No. 1 MBC (outby) and the rib	Fatal

Nonfatal injuries, 1991 through October 1995

Year	1991	1992	1993	1994	1995
No. of injuries	37	34	32	48	30

- Equipment should not be operated in restricted entries. Adequate clearance should be provided for the type of equipment being used in order to provide sufficient space for MBC operators to access and leave the equipment and to provide an escape route in case of emergency.
- If the system is designed with the operator's compartment on the right side of the MBC and the continuous haulage system is set-up on the left side of the conveyer

belt, adequate clearance should be provided and safe procedures should be exercised by the equipment operators when accessing or leaving operator's station to prevent pinch points between the belt and the haulage system.

■ When the system is designed with the operator's compartment on the left side away from the conveyer belt, the setup should provide adequate clearance away from moving equipment.

■ Any panic bar and/or emergency stop switch in any of the MBCs should de-energize the entire system when activated. Manual positions on sequence switches should not be used to run the system continuously.

■ The panic bar and/or emergency stop switch on the most inby MBC must be able to also deenergize the continuous mining machine.

■ The entire system should be deenergized when any operator of the MBC is not at his/her operating station.

■ All workers and operators, including the miner operator, should maintain adequate means of two-way communication with each other.

■ All MBCs should be designed with operators' cabs or canopies in seams 42 inches or above.

■ Miners must not cross over the bridge system until the entire system is deenergized.

■ Miners must not cross under the moble bridges until it is secured on the ground or otherwise blocked to prevent collapse.

Mark your calendar... plan to attend!

Health and safety seminar for small mines – August 14, 1996

On Wednesday, August 14, 1996, the Ramada Inn in Somerset, Pa., will be the site of the Health and Safety Seminar for Small Mines. The seminar is sponsored by The Pennsylvania State University, USBM, MSHA, Pennsylvania Coal Association, Pennsylvania Aggregates and Concrete Association, Pennsylvania Bureau of Deep Mine Safety, and Canterbury Coal Company.

The seminar features timely presentations on a number of small mine health and safety issues, such as: effective training and safety material for small mines, improving response management skills, the real cost of accidents, health and safety resources, plus several presentations by the coal and non-coal industry on effective ways to achieve admirable safety and health results through low-cost programs. This seminar has something for everyone interested in health and safety.

In addition, several exhibitors from government and educational institutions will display their health and safety material. The seminar fee of $20 includes refreshment breaks, the presentations, and a buffet lunch. Please call Mary Ann at The Pennsylvania State University for more information. Her telephone number is: 814/865-7472. Or fax at 814/865-3248.

Registration Form

Last name *First name* *Middle initial*

Social security no. *Title*

Company name

Business address (number and street or box no.)

(city) *(state)* *(zip code)*

Business phone *Home phone* *Fax*

Home address (number and street or box no.)

(city) *(state)* *(zip code)*

Enclosed is a check for $ ____ ($20/person) made payable to: 'The Pennsylvania State University' Return to:

Mary Ann Sherburne, Staff Assistant, Department of Mineral Engineering
The Pennsylvania State University, 126A Hosler Building, University Park, PA 16802-5000
Telephone: 814/865-7472, FAX: 814/865-3248

Miner's responsibility to evaluate safety of assigned work area

The intent of mine safety laws and regulations is to ensure the safety and health of miners. In order to accomplish this goal, three important safety components must be provided:

1. Equipment in safe operating condition
2. Safe operating procedures
3. Safe work environment to operate equipment

Providing these safety components is a responsibility shared by both the **miner** and the **mine operator;** all three components are essential in preventing accidents. A miner operating a well maintained drill in accordance with safe operating procedures can still become an accident victim if struck by rock loosened by vibration during the shim. It is not enough to rely solely on pre-shift inspections of equipment and work areas, conditions of both can change during the shift.

Accidents can best be avoided by making sure **YOU** protect yourself by:

- Making pre-shift inspection of assigned mobile or stationary equipment to detect serious safety defects that must be corrected prior to use.
- Operating assigned equipment in accordance with instructions/ training provided by manufacturer and company officials.
- Monitoring the ever-changing conditions of your work environment to detect and avoid hazards that develop from on-going activities, weather, or other conditions.

Mining laws and regulations assign specific responsibilities related to mine safety, but in the final analysis, careful attention to what you are doing, how you are doing it, and where you are doing it is your best assurance in avoiding mining accidents.

Submitted by: Robert E. Morgan, Division Of Mineral Mining, Commonwealth Of Virginia, Dept. of Mines, Minerals, & Energy P.O. Box 3727, Charlottesville, VA 22903 Telephone: 804-961-5000, FAX: 804-979-8544

Minerals and the Fourth of July

As the nation gets ready to celebrate the anniversary of its Declaration of Independence on July 4, take a moment to consider the minerals that make fireworks such a spectacular part of the festivities: Each color in a fireworks display is produced by a specific mineral compound:

- greens are made with barium;
- deep reds are a product of strontium;
- blues come from copper; and
- yellows require sodium.

More colors can be created by mixing compounds. Strontium and sodium together produce a brilliant orange. Titanium, zirconium, and magnesium alloys combine to make a silvery-white. Copper and strontium mix to yield a lavender.

Certain minerals are used for special effects. Iron filings and small particles of charcoal produce gold sparks. If you want a loud flash, fine aluminum powder is the fuel to choose. Larger particles, such as small flakes or granules, give a longer, shower-like effect. Magnalium, a magnesium-aluminum alloy, can produce a tiny series of silvery-white flashes. Aluminum antimony-sulfide and aluminum antimony-perchlorate are some flash mixtures.

Although fireworks date back to ancient China, they continue to grow in popularity. Just in the past decade, their use has doubled to nearly 30,000 short tons per year. Of this amount, consumers buy two-thirds. The remainder go for fireworks displays. About 85% of consumer fireworks and half of the display variety are imported from China, Japan, Korea, and such European countries as France and Italy.

The role of minerals in fireworks is just one example of society's growing reliance upon minerals for the manufacture of everything from automobiles to toothpaste. During the lifetime of the average American, he or she will use;

- 750 pounds of zinc,
- 900 pounds of lead,
- 1,500 pounds of copper;
- 3,600 pounds of aluminum
- 26,000 pounds of clay;
- 28,000 pounds of salt;
- 33,000 pounds of iron,
- 365,000 pounds of coal; and
- 1,240,000 pounds of sand, gravel, and cement.

As you can clearly see, our personal independence relies on minerals dependence.

*Reprinted from the U.S. Bureau of Mines' Office of Public Information's pamphlet: "**Fourth of July Fireworks Depend Upon Minerals.**"*

Have a SAFE holiday!

Leave fireworks display to the experts...

Hazards related to mobile equipment tires

By Robert E. Morgan, Virginia Department of Mines, Minerals, & Energy

Over the years, there have been a significant number of injuries nationwide resulting from miners and contractors working around tires used on mobile equipment at mineral mining sites. In one incident, a truck driver was killed when the split-rim of his spare tire failed while he was preparing to unload equipment. More recently, a miner was seriously injured when a split-rim tire mounted on a loaded water truck failed as he attempted to inflate the tire. In addition, several tire service company repairmen have been injured while mounting tires on mobile equipment.

Investigations of such accidents indicate the following:

(1) A significant number of split-rims remain in service.

(2) Most of the accidents involved an unsafe act or practice by the injured victim.

(3) Evidence suggested the condition of the rim or tire contributed to the accident. Mobile equipment operators, tire repairmen, and other persons who work around tires can avoid injury from flying rims and exploding tires by following these safe work practices:

(1) If possible, replace older split-rims with improved design rims. If split-rims must be used, follow safe work procedures. Prior to tire mounting, carefully inspect rim and tire to ensure both are in safe condition; corrosion or deformity of metal parts can prevent rims from locking securely in place. Cracks in tire sidewalls can contribute to tire failure.

(2) Prior to inflating any tire, make sure you are not directly in front of or over the tire in the event of a failure of the rim or tire carcass. The use of a clip-on device allows tire inflation from a stand-off location.

(3) Tires must be deflated prior to the start of repairs on them, and split (locking) rim tires must be inflated in a tire cage or by use of safety chains or other suitable device as required by MSHA Standard 56.14104.

(4) When mounting large tires by use of truckmounted hoists, ensure that tires are secured to the wheel hub prior to release of the hoist chain or cradle. Stay clear of tires being hoisted up onto truck beds.

TIRE SAFETY RULES

- ***Don't work on wheel/tire assemblies without a safety cage or other restraining device;***
- ***Don't stand too close during tire inflation/deflation;***
- ***Don't hit inflated wheel/tire assemblies with a hammer;***
- ***Don't weld rims on wheel/tire assemblies;***
- ***Don't deflate only one tire of a dual assembly;***
- ***Don't pound on inflated tires***
- ***Don't cut, or weld on assembled tires***
- ***Repairs to rims and lock rings should ONLY be done by qualified people***
- ***Be on the safe side—use a cage when working on tires and rims***
- ***Always stand away from the cage and out of the trajectory of tire and rim assemblies***

Tire tragedy on I-95

On Nov. 26, a man driving a truck north on Interstate 95 experienced trouble with his vehicle and pulled into a rest stop in Cecil County, Md., near the Delaware line. The driver thought he had a flat tire and injected two cans of instant "*Fix-a-Flat*" sealant into the tire. That didn't help. Then the driver noticed something appeared wrong with the way the tire was mounted. He called a vehicle service business.

A 51-year-old Baltimore man, Melvin Terrance Stapf, responded, with a service truck. He took out a welding torch to work on the tire mount. The truck driver did not tell him about the "*Fix-a-Flat*" sealant he had injected into the tire.

As the torch was lit, the tire exploded. The tire rim struck Stapf in the head before landing nearly 300 feet away. Stapf was killed instantly.

The tragic accident reminds us of how dangerous "*Fix-a-Flat*" [or other instant sealant] products can be. We might want to reread the fine print on the can to check for safety concerns.

Reprinted from the December 8, 1995 edition of the ***Washington Post.***

Students of the McCaw elementary school in Henderson, Nev., pose in front of the partially completed "School of Mines"—the first of its kind in the country. Note the headframe in the background.

Grade school creates school of mines; needs displays

Mining is the second largest industry in Nevada, but there is no place in southern Nevada where students can go to experience historical and modern mining.

The Gordon McCaw Elementary School in downtown Henderson, Nev. (near Las Vegas), is building the McCaw School of Mines on its campus as a field trip destination for the 170,000 students of Clark County School District and students from throughout the region. Field trips will be available at little or no cost to students. Pre-field trip packets and supplementary activities will be available for teachers. McCaw students and community volunteers will serve as docents of the mine.

Construction on the $200,000 project began in late September 1994, with an estimated completion date of Christmas 1996.

At the school of mines, students will experience a mine tunnel, learn about the geology and history of Nevada, have hands-on experiences in mineralogy, learn about current mining practices, and determine what types of products that we use every day come from a mine. A recirculating stream will provide students with a place to pan for gold, says the school's principal, Dr. Janet Dobry. The project is being developed on the west portion of the elementary school grounds and will consist of five mining display rooms and simulations of an open pit mine, a mine elevator, and a tunnel. The mine, a 4,649-square-foot structure, was developed through a collaborative effort between educators, school officials, the business community, and local government.

Architect William Snyder explained that elementary school students have helped design the project. McCaw students are participating in all phases of the project from concept, design, site survey, construction, and, eventually, operation.

Remembering the groundbreaking ceremony, Snyder said, "We were very happy with the turnout... the enthusiasm in the faces of these kids."

Snyder said several casinos, including *Sahara Gaming* and *Stations Casinos* in Las Vegas and the *Eldorado Casino* in Henderson, have donated a total of $60,000 to the project, and other businesses have pledged another $60,000 in money and materials.

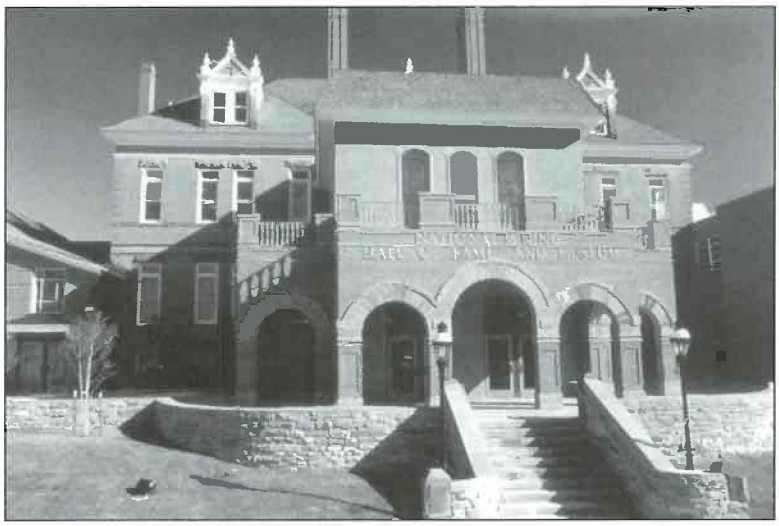
A team of volunteer parents, teachers, and community and business leaders is working with private funding and donations. No Clark County School District funds are being used for this project.

One of the volunteers, Samuel Upton, a retired school district employee, said, "This is one of the greatest projects that's come along because Nevada has been so deeply involved in mining."

Dr. Dobry reports that the school currently is soliciting help with the sponsorship or donation of interactive displays and exhibits to bring mining alive to students. Anyone interested in helping can contact the school at 57 Lynn Lane, Henderson, NV 89015; or call: 702-799-8930.

This article is an amalgam of articles from the December 11, 1995 issue of the National Mining Association's ***NMA Journal****, a press release from the McCaw School by principal Janet Dobry, and an article by Bob Shemeligian, Staff Writer for the* ***Las Vegas Sun.***

Pictured at near right, is the facade of the National Mining Hall of Fame and Museum in Leadville, Colo. At far right, a vacationing couple examine the names of those enshrined in the museum's Hall of Fame.



The mother lode

The National Mining Hall of Fame and Museum

LEADVILLE, Colo., Nov. 1995--Prospectors and miners opened much of the American West, and the modern mining industry still supports many regional western economies. And nowhere is the mining industry, past and present, better displayed than at the National Mining Hall of Fame and Museum in Leadville.

In 1977, the museum's founding fathers originally envisioned a large, modern museum complex near the Colorado School of Mines in Golden. But when the American mining industry plunged into the worst depression of the century in 1980, vital corporate support waned. Abandoning their original plans, like miners fleeing a worn-out-mine, the directors considered several alternate locations, including the famed historic mining centers of Butte, Montana; Lead, South Dakota; and Leadville.

In 1986, museum directors finally decided upon Leadville, acquiring and moving into a spacious, four-story, century-old, Victorian school complex. Clinching the deal was a negotiated $0.50 per annum rental agreement, in perpetuity, with the school district.

The first special tours were conducted in 1987. A year later, then-President Ronald Reagan signed into law a bill granting the National Mining Hall of Fame and Museum a federal charter as a nonprofit organization. Today, the museum hosts more than 25,000 visitors annually.

In July 1995 it completed an $838,000 renovation and new construction program, thus capping an investment of more than $2 million in only eight years in transforming the former 70,000-square-foot building, constructed in 1899, into a world-class educational facility.

The heart of the facility is the National Mining Hall of Fame. Here, engraved photographs and biographical information about the inductees are displayed. Honorees are inducted annually at a black-tie (optional) banquet, the most recent was held in September 1995 in Denver, Colo. To date, 126 mining legends have been enshrined—men and women who pioneered America's mining frontiers and developed our nation's mineral resources.

The museum's Gold Rush Room displays gold specimens and artifacts from each of 17 states that have hosted historically significant gold rushes. Another popular exhibit is a remarkably realistic walk-through replica of an underground hardrock mine, complete with mine-gauge track, winzes, shaft stations, drills, ore chutes and cars.

Other displays include thousands of fine specimens of gold, silver, ores, and minerals, including rare and spectacular specimens loaned from such distinguished collections as those of the Smithsonian Institution and Harvard Mineralogical Museum.

Mining historians will find an extensive collection of frontier era mining artifacts, including hammers and hand steels, early "widow-maker" mechanical drills, candle holders, and carbide lamps. There's also a 22-scene series of dioramas of the history of gold mining in Colorado, depicting every aspect of frontier mining from panning, sluicing, and hydraulic mining to underground drilling and blasting.

With the completion of its face-lifting project in July of 1995, the museum under Executive

At far left, some of the minerals extracted (the reason for the museum's existence) are exhibited. Near left, the beautifully detailed dioramas of historic and present day mining operations are depicted.

Director Carl Miller, a retired Climax Molybdenum Co. miner, plans to build an underground and surface coal mining exhibit. Also on the planning board is a memorial room, The Magic Room of Industrial Minerals, to show how non-metallic minerals are vital to our everyday living.

Board Chairman Richard Moolick, a retired president of Phelps Dodge Corp., says, "There are many aspects to mining and we want to offer the public as many as possible. After all, if you use it, it comes from mining."

The National Mining Hall of Fame and Museum is located at 129 West 9th Street in Leadville, Colo., which rose to international prominence with bonanza silver strikes in 1877. Today Leadville's cumulative production of gold, silver, lead, zinc, and copper exceeds a half-billion dollars—some mines are still producing.

The Museum is open daily, 9 am to 5 pm, from May 1 to October 31; winter hours are 10 am to 2 pm, Monday through Friday. For information call 719-486-1229.

Information and photographs courtesy of Charles S. Morris, Public Relations Consultant, the National Mining Hall of Fame and Museum, P.O. Box 981, Leadville, CO 80461-0981, Phone: (719)) 486-1229, FAX (719) 486-3927

Far left, from left to right: Tom Baker, UMWA local comm. chmn.; Mike Holyman, UMWA 1604 VP; James Carnes, Randy Gaudio, admin. mgr.; and Gary Dimmerling, gen. mgr. At left, left to right: Tom Baker; Randy Gaudio; Tom Johnson; Mike Holy-man; and Gary Dimmerling.

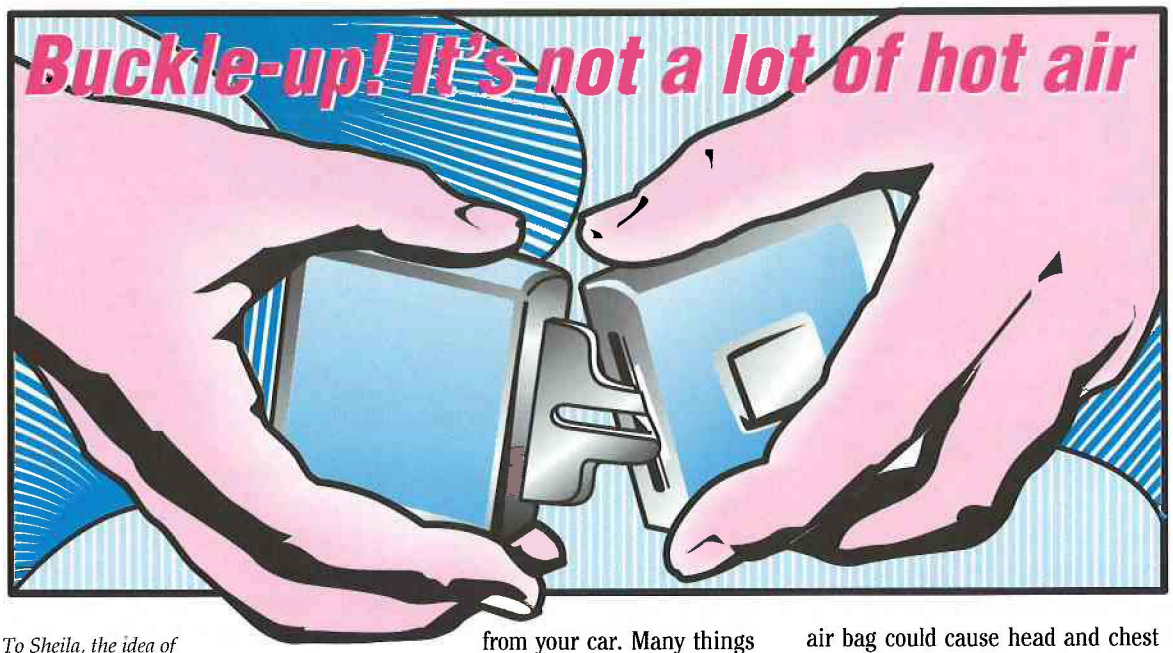
COCCo recognized for safety

American Electric Power's Central Ohio Coal Company was recognized for their safety achievement during the monthly meeting of the Mid Ohio Chapter of the Holmes Safety Association. The ceremony and dinner was held at EagleSticks golf course and restaurant in Zanesville, Ohio on February 27, 1996.

State Senator James Carnes and Representative Tom Johnson presented the coal company employees with House and Senate resolutions honoring their accomplishments.

AEP's Muskingum Mine worked 390 days totaling 489,000 employee-hours without a lost-time accident. This mine is the largest surface mine in Ohio with 230 employees and produced more than 1 million clean tons of coal in 1995. The mine is located 25 miles southeast of Zanesville in Morgan County.

Buckle-up! It's not a lot of hot air



To Sheila, the idea of wearing a seat belt while driving with an air bag seemed redundant. For months after buying her new car, she resisted wearing the belts—the belt wrinkled her dress. She would not have worn her seat belt that night in November except for the badgering of her daughter—under the child's onslaught Sheila capitulated. This probably saved her life when the car hit an icy area and struck a light pole at 45 mph. Sheila walked away from the wreck unscathed. She doesn't worry about wrinkling her dress anymore.

Superior engineering is making cars safer, but the final responsibility for safety rests with the people behind the wheel.

I'd rather be thrown clear

Lifetime odds are 1-in-3 that you will be seriously injured in a traffic crash, according to the American Academy of Orthopedic Surgeons, and 1-in-100 that you will be killed.

The majority of crashes causing injury or death occur within 25 miles of home at speeds under 40 mph. The good news is, people who wear restraints cut the risk of serious or fatal injury in those accidents between 40% and 55%.

Some insist their chances of surviving a serious accident are better if they are thrown from their car. In fact, you are 25 times more likely to die when you are thrown from your car. Many things can happen when you are hurled from a wildly careening automobile, and few are good. You can be:

- thrown through the windshield.
- thrown into oncoming or trailing traffic, or against a pole or tree.
- flung across lacerating surfaces.
- crushed by your own car.

The safest place in an accident is inside your car. Buckle up!

For the skeptics, please note: drowning or incineration accounts for less than 0.1% of deaths in auto accidents—it's easier to escape if you're conscious.

Air bags

Air bags are a supplement to safety belts and are not intended to be a substitute for them. By design, air bags only inflate during frontal collisions. They offer no protection during rear end crashes, rollovers, or side contact. A safety belt will offer protection during these incidents. The combination of air bags and safety belts can reduce the risk of injuries in a crash by as much as 60%.

In vehicles with air bags:

- Everyone should wear a safety belt.
- Place rear-facing child safety seats in the back seat of vehicles with passenger-side air bags. A deploying air bag could cause head and chest injuries to a small child.
- Keep your hands away from the steering wheel hub that contains the air bag. An inflating air bag could break a hand or fingers.
- Sit as far back from the steering wheel as is comfortably possible. The further away you are, the more efficiently the bag will work.

Additional tips

- Pregnant women should position the lap belt as low as they can under the abdominal bulge and let the shoulder strap rest between their breasts. Wearing both belts will protect both the mother and the fetus. In cold weather, unbutton outer clothing so the belt won't creep up.
- Do not hold a child on your lap in a moving automobile. In a crash, it could be crushed by the adult passenger. The only safe place for a child is in an approved safety seat.
- For everyone's protection, back-seat passengers should be buckled in so they won't become dangerous projectiles in the event of a crash.
- If you must drive with your pet, purchase a pet seat belt.

Reprinted from the January/February 1996 edition of **Safety times** *by John Myre, publisher.*

Capsule news...

Coal production and consumption will hit all-time record levels by year-end, each exceeding 1 billion tons, according to National Mine Association's short-term coal forecast. Production in 1996 is expected to increase by 2.4% to a record 1.046 billion tons from 1995's estimated 1.021 billion tons. Production in the West will grow nearly 5% to 504 million tons, topping the 500 million ton level for the first time. Production in the East will show only a small improvement over 1995 levels to total approximately 542 million tons. Total coal consumption—for domestic use and for export—is expected to grow to 1.050 billion tons by year-end, up from 1.033 billion tons in 1995. Coal for electricity generation remains the only domestic market to show an increase, as coal use for coking and industrial purposes continues to be essentially flat. More than 80% of U.S. coal production is consumed by utilities and non-utility generators to produce power.

Reprinted from the March 1996 issue of ***COAL PEOPLE MAGAZINE****, Vol. 20, No. 7, copyright 1996 by Al Skinner, Editor/Publisher.*

Technology off the job...

Home

The Sunshine State is the testing ground for a **new computerized photo-voltaic** (PV) **residential water heater** The Florida Solar Energy Center in Cocoa has begun a one-year trial of the NIST-built device that uses computer technology to maximize the conversion of sunlight into electricity. A microprocessor reacts to light intensity changes and kicks in the appropriate electrical resistive elements for maximum energy conversion from sunrise to sunset. Unlike previously proposed PV cells for residential homes, it does not require the use of storage batteries to provide energy and does not need an expensive electronic inverter to convert dc current produced by the PV cells into ac current required for household appliances.

Reprinted from the March 13, 1996 issue of ***Industry.Net Report*** *by Automation News Network.*

Mine deaths rise in 1995

On-the-job deaths in U.S. mines rose last year for the first time since 1990, J. Davitt McAteer, assistant secretary of Labor for Mine Safety and Health, said in early February. Last year, deaths totaled 98 compared with 1994's historic low of 84. Mining deaths also numbered 98 in both 1992 and 1993.

In U.S. coal mines, deaths numbered 47 (22 underground and 25 on surface) compared with 1994's record low of 44. In the metal and non-metal sector, fatalities rose to 51 (8 underground and 43 on surface) from 1994's record low of 40.

"Clearly, we need to take a hard look at what's happening in surface mines," McAteer said. "We've been concerned for some time about the large number of fatal accidents involving mine trucks and have held seminars for miners on haulage safety around the country. In the coming year, we hope to do more."

In coal, metal, and non-metal mines, accidents involving trucks, front-end loaders, and similar equipment used in surface operations were the single most frequent type of fatal accident in 1995. Fatal electrical accidents more than doubled in 1995 compared with 1994, and metal and nonmetal mines also saw a rise in deaths that involved machinery.

"The Federal Coal Mine Health and Safety Act of 1969 and its 1977 amendments that incorporated metal and non-metal mines into the same system have been very successful. The federal Mine Safety and Health law has made life much safer and healthier for American miners and to jeopardize that progress would be a step backward," McAteer said.

Mining deaths in the U.S.

Year	Coal mines	Metal/ nonmetal mines	Total
1968	311	182	493
1969	203	179	382
1970	260	165	425
1971	181	164	345
1972	156	234	390
1973	132	175	307
1974	133	158	291
1975	155	123	278
1976	141	113	254
1977	139	133	272
1978	106	136	242
1979	144	123	267
1980	133	103	236
1981	153	84	237
1982	122	68	190
1983	70	62	132
1984	125	80	205
1985	68	57	125
1986	89	49	138
1987	63	67	130
1988	53	49	102
1989	68	48	108
1990	66	56	122
1991	61	53	114
1992	55	43	99
1993	47	51	98
1994	44	40	84
1995*	47	51	98

** Preliminary*
Source: MSHA statistics

Reprinted from the April 1996 edition of Maclean Hunter Publishing Co.'s ***Engineering & Mining Journal****, p. 16F.*

20

18-month-old small mine safety program hits the road in Appalachia

During his 18 months as coordinator of MSHA's small coal mine safety effort, Jesse Cole's program has compiled ample information on why bad accidents happen to small operations.

Now he and his staff plan to take what they've learned on the road.

Cole's people will take the mine emergency unit's command vehicle, based out of Beckley, W.Va., to select small mine sites in West Virginia, Virginia, and Kentucky. The elaborate vehicle will be used for presentations to mining crews, which will cover the accident findings in detail.

The MSHA command center, typically used at mine disasters, started the field trip April 1. The vehicle has room to seat 12 to 15 people. It has an overhead projector with screen to show graphics and presentations on accident trends at small mines.

"By still being local here, we can still get to an accident" quickly, Cole said. The tour started in Southern West Virginia.

MSHA is concerned about high accident and fatality rates at small coal mines in Appalachia, and Cole views his unit's role as key to reducing the region's occupational death rate.

"We would hope that our work, being focused as it is in this tri-state area, results in accident reduction," he said.

Picture brightens slightly in '95

Small mines, generally defined as employing no more than 20 miners, tend to have worse accident rates than large operations. A number of reasons are cited for this. Small operators mine veins the big boys pass up; they tend to have older equipment and less money for safety programs and training. Some critics also claim small mines are more susceptible to market pressure causing safety shortcuts.

But there was a bit of good news on the small mine front in 1995.

For the 5-year period of 1990 through 1994, there was an average of 13 fatalities per year at small mines in West Virginia, Kentucky, and Virginia. In 1995, there were only 4 deaths at small mines in the three states.

But the figures appear to be creeping back up in the first quarter of 1996.

As of March 26, three of the 10 coal mining deaths nationwide were at small mines in Kentucky and West Virginia.

Cole is quick to note that 15 months is not enough to really identify safety trends.

Overall, MSHA, the states, and industry have engaged in an intense joint effort to bring the small mine fatality rate down.

Cole has "struck an excellent line of communication with the small mines in the state," said West Virginia Coal Assn. Vice President Chris Hamilton. The federal agency has abandoned its "shotgun" approach to the problem and realized there are both good and bad small operators, Hamilton said.

The agency has done less hollering "the sky is falling" and more work on attacking the problem, Hamilton said.

"There's a good bit of coal produced and it's produced by small mine operators" in the tri-state area, said Cole, an MSHA district manager prior to his appointment as small mine czar by agency chief Davitt McAteer.

Cole's unit has found roof bolter operators, continuous miner operators and helpers, as well as foremen tend to be involved in the most accidents.

The number of roof bolter accidents finally appears to be flattening, but they are "still vulnerable because of their task," Cole said.

MSHA's original report outlined both training and enforcement measures likely to focus a spotlight on small mines. At the initial small mines summit, much of the debate centered on whether MSHA was too lax on small mines, or whether the agency was regulating the little guy out of business.

MSHA has 8 field specialists assigned to its small mines unit, seven of whom work out of the district offices in the states of Kentucky, Virginia, and West Virginia where many small mines are located.

"The small mines unit has conducted a detailed statistical analysis of the reported injuries and fatalities," for the tri-state region, Cole said.

The goal is to determine the 'who, what, and where' of mining injuries and fatalities at small mines. The accident statistics were used to create graphs and charts to illustrate accident profiles. More than 60 charts and graphs were developed for surface and underground coal mines in each of the three states.

Reprinted from the April 5, 1996 edition of the ***Mine Regulation Reporter,*** *Section: No. 7, Vol. 8; ISSN: 1040-8223.*

Labor secretary names committee on black lung and silicosis

Secretary of Labor, Robert B. Reich has appointed a 9-member advisory committee to make recommendations on how to eliminate black lung and silicosis among coal miners. The newly formed committee conducted its first meeting in February.

"We are pleased to have such a knowledgeable, well-respected group of individuals to address these debilitating occupational diseases," said Reich. "I am hopeful that the efforts of this committee will lead to the elimination of black lung and create a more healthy workplace for our nation's miners."

Since the Federal Coal Mine Health and Safety Act of 1969 set limits for respirable dust, average dust concentrations in underground coal mines have declined from 8.0 mg/m<3> to the current standard of 2.0 mg/m<3>. However, recent evidence indicates that miners continue to develop black lung and silicosis. Black lung results from excessive exposure to coal dust and silicosis from exposure to quartz dust. Both diseases are disabling and can be fatal. Currently, black lung disability benefits cost the federal government more than $1.3B/yr, with 75,000 former miners receiving benefits.

"We will be asking the advisory committee to address the full range of respirable dust issues," said J. Davitt McAteer, assistant secretary of labor for mine safety and health. "That includes the available means to control the dust, improve dust monitoring, the exposure limits necessary to prevent the disease, the role of the miner in dust monitoring, and the adequacy of the programs under which mine operators take samples to determine the dust levels to which miners are exposed.

The majority of the nine-member advisory committee has no economic interest in mining. Two members, Joseph Main, administrator of the department of occupations health and safety at the United Mine Workers of America, and James Weeks, associate research professor in the division of occupational and environmental medicine at the George Washington University Medical Center, represent organized labor; and two others, John Gibbs, vice president of health management and corporate medical director of the Kerr-McGee Corp., and Joseph Lamonica, vice president for health, safety, and training at the Bituminous Coal Operators Assn. Inc., represent the mining industry.

The neutral members include: David Weman, chairman of the Department of Work Environment and a professor in the College of Engineering and the University of Massachusetts–Lowell; John Dement, an associate professor in the division of occupational and environmental medicine at Duke University Medical Center; Kathleen Kriess, director of the occupational and environmental medicine division at the National Jewish Center for Immunology and Respiratory Medicine in Denver; Raja Ramani, professor of mining and head of the department of mineral engineering at Pennsylvania State University; and Carol Rice, an associate professor of environmental health at the Kettering Laboratory, University of Cincinnati.

Reprinted from the April 1996 edition of Maclean Hunter Publishing Co.'s ***Engineering & Mining Journal****, North American roundup section; p. 16Q.*

Inter-state report

All states: Reporting on-the-job injuries

Employers can reduce workers' compensation costs by reporting workplace injuries and illnesses soon after they happen. According to a recent study, medical care and lost wage payments cost about one-third, or $2,744 less, when an employer reports an injury or illness shortly after it happens than if the employer reports the incident a month or more later. Early reporting leads to early intervention in case management activities by workplace injury specialists, with lower medical care and wage-loss expenses. It also leads to quicker indemnity payments, which ease injured employee's concerns about lost wages.

Where is your lawn mower?

There has been widespread theft of John Deere equipment, with losses totaling more than $8 million in the past several years. Ohio has reported $2.5 million in thefts; Pennsylvania, $2 million; Virginia, $1.6 million; and West Virginia, $410,000.

Only 13 percent of the nearly 1,500 stolen tractors and riding mowers have been recovered.

Reprinted from Erie Insurance Co.'s ***InSync***

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Mine rescue contest held in underground safety research coal mine

History was made at the Pittsburgh Research Center in Bruceton, Pa., on Thursday, April 18, 1996, the Department of Energy said. For the first time, the Northern Metal/Nonmetal Mine Rescue Association held its annual competition in an underground mine.

Pictured at right, are some of the mine rescue teams in action at the Northern Metal and Nonmetal Mine Rescue Competition recently held at the old BOM's Pittsburgh Research Center in Bruceton, Pa.

Nine teams representing six mines and five companies from three states met to test their skills in mine safety, first aid, and emergency response. Trophies and bragging rights were at stake. These exercises are part of their overall training before they move on to the National Competition to be held in Nevada in August 1996 where the "best of the best" will further compete in mine rescue preparedness.

What made this particular contest unique is the fact that it was held underground in the Center's Safety Research Coal Mine (where 300 people conduct research to improve the health and safety of American mine workers). With the exception of the contest held annually in the University of Missouri's Rolla campus teaching mine, all other contests are held in mock mines built on football fields, hotel grounds, or in convention centers. This is the only present-day contest in which participants will have to contend with real smoke

for part of the problem-solving. "We are pleased that our unique research facilities are also available for improving the realism and effectiveness of mine rescue training," said research center director John Murphy.

The contest is broken down into three parts. First, there is a written test in which the five members of each team demonstrate their knowledge of mine gases and their toxicity, first aid, use and care of their instrumentation, and overall mine safety. Second, in the underground portion of the contest, the teams show their hands-on skills in searching the entire mine in a systematic way, locating "victims," administering first aid and evacuating "survivors," locating problems such as fires, electrical hazards, high water levels, and loose roof rocks, and correcting these problems so they can continue their search for additional trapped personnel. Finally, in part three, the team member responsible for the maintenance of the breathing apparatus will be tested to demonstrate his or her knowledge of the apparatus and skill in problem-solving.

First place honors went to the team from AKZO-Nobel's Retsof Mine, a salt mine in Retsof, N.Y. A team from Cargill Salt's Cayuga Mine in Lansing, N.Y., came in second. The team from Doe Run Mine, a lead/zinc mine in Viburnum, Mo., placed third.

For further information contact: Jacquie Jansky of the Department of Energy at 412-892-6615.

Reprinted from the **Public Relations Newswire** *Association's Wednesday, April 10, 1996 issue.*

Photographs accompanying this article were graciously provided by Robert J. Tuchman, Writer-Editor, U.S. Department of Energy, Pittsburgh Research Center, P.O. Box 18070, Pittsburgh, PA 15236-0070. He can be reached at (412) 892-6611 or FAX (412) 892-6678.

BOM safety work could head to NIOSH under Clinton administration plan

Bureau of Mines (BOM) safety research, conducted at centers in Pittsburgh and Spokane, could come under direction of NIOSH in FY 1997 under a Clinton administration proposal.

BOM's health and safety research efforts are being transferred into the Dept. of Energy (DOE) this fiscal year, but that might be a temporary way station. The administration's FY 1997 budget request calls for moving the Bureau centers to the National Institute for Occupational Safety and Health (NIOSH). It's unknown if the GOP-led Congress will go along.

It is a move favored by the United Steelworkers and United Mine Workers unions, but opposed by the National Mining Assn (NMA).

DOE, which supervises the nation's national labs, has the managerial and scientific expertise to handle the BOM research, and there is no reason to move these programs again, said NMA safety and health chief Bruce Watzman.

NIOSH is part of the Dept. of Health and Human Services' Centers for Disease Control. "The work that we do compliments the work of NIOSH" and "vice versa," said Pittsburgh Research Director John Murphy. The BOM researchers at Pittsburgh and Spokane concentrate on mine safety, health and disaster prevention efforts. NIOSH concerns itself with occupational medical and epidemiological research.

People who are still on the job at Bureau of Mines research stations have been through a lot. They no longer work for a stand alone agency; hundreds of their colleagues were laid off; and the health/safety folks are being moved to DOE while other parts of the agency were eliminated, privatized or bequeathed to the U.S. Geological Survey or Bureau of Land Management.

Overall, agency researchers are "less concerned about where we are going" than was the case a few months back, Murphy said. The anxiety level has subsided.

On a related note, a recent General Accounting Office report details changes being enacted at the Pittsburgh research center as part of the administration's efforts at government "reinvention."

BOM's Pittsburgh center was the largest of the Interior Dept.'s nine research labs, while it was still under the auspices of that agency.

As one of the government's model "reinvention" labs, the federal government looked at the Pittsburgh center and discussed ways to make it run smoother and more effectively.

Among the reinvention moves, which are being used, are improving the process for selecting research projects; creating "self-directed work teams" to do research; and revising the personnel evaluation system.

"These changes... were well under way before the decision to close the Bureau came down," Murphy said.

"The new process would be a major change from the research center's longstanding mode of empire building and competition between research groups for funding," GAO concluded. "Officials from the reinvention teams anticipated that loyalties would need to shift from individual research groups to the research center as a whole."

Murphy said he had not received the GAO report yet, but understood how competition between the research groups could be "perceived" as a problem.

The BOM Pittsburgh center still includes a large and experienced group of government researchers, and an impressive array of hardware. The center's physical assets include:

- An experimental mine, which permits research on the prevention of mine fires and explosions;
- The safety research coal mine, where tests of new equipment and technology is done before transfer to industry;
- The mining equipment test facility, which houses specialized testing labs;
- The wire rope research laboratory for research on improving safety in hoisting personnel and materials; and
- The Lake Lynn laboratory, where large-scale explosion tests and mine fire research are conducted.

To order *Management Reform: Status of Agency Reinvention Lab Efforts (GAO/GAD 96-69)* call 202-512-6000, or fax a request to 301-258-4066. Send mail orders to: U.S. General Accounting Office, P.O. Box 6015, Gaithersburg, MD 20884-6015. The first copy of a GAO report is free. Additional copies are $2 each.

Reprinted from the April 5, 1996 edition of the ***Mine Regulation Reporter****, Section No. 7, Vol. 8; ISSN: 1040-8223.*

THE LAST WORD...

Cox's Realization. The prediction that will be fulfilled is the one you didn't have the nerve to voice. —Richard Cox

Dale's Dictum. You can't climb a mountain from inside your tent.—Dale Wilkins

DeBleyker's Discovery. Forgetting is a poor excuse for not remembering.—J.R. DeBleyker

Doudna's Given. Whenever you tell someone what you paid for something you bought, you find out either (a) where you could have bought the same thing cheaper, or (b) where you could have bought something better for the same price.—Paul Doudna

First Law of Government Dynamics. For every action, there is an equal but opposite inaction.—Mike McGuire, from Craig Offutt

Fitzwater's Prescription for Improving the Clinton White House. A few more fat old bald men wouldn't hurt the place. —Marlin Fitzwater, in *Newsweek*

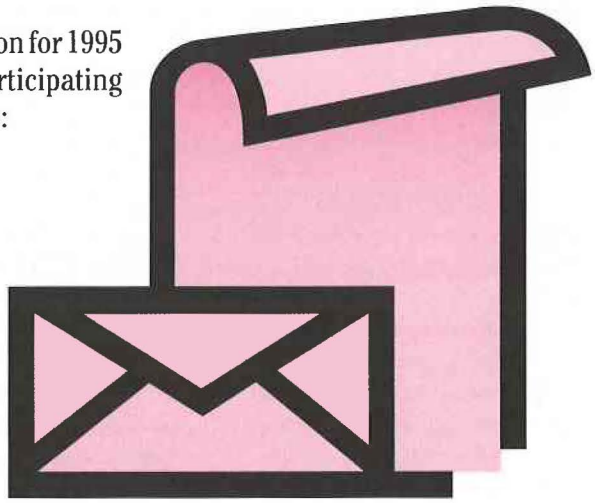
Fred's Forecast. Golf is like children. They're both humbling experiences waiting to happen. —Fred Whistle

NOTICE: We welcome any materials that you submit to the Holmes Safety Association Bulletin. We **DESPERATELY** need color photographs suitable for use on the front cover of the ***Bulletin.*** We cannot guarantee that they will be published, but if they are, we will list the contributor(s). Please let us know what you would like to see more of, or less of, in the Bulletin.

REMINDER: The District Council Safety Competition for 1995 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
Holmes Safety Association Bulletin
P.O. Box 4187
Falls Church, Virginia 22044-0187

Please address all editorial comments to the editor, Fred Bigio, at the above address. Phone: (703) 235-1400



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This month's cover: A JOY 4LS longwall shearer, courtesy of Joy Technologies, Inc. We welcome ***any*** *materials that you submit to the Holmes Safety Association* ***Bulletin****. We especially need color photographs (8" x 10" or larger—color negatives are acceptable) for our covers. We cannot guarantee that they will be published, but if they are, we will list the contributor(s).*

Because of the recent federal shutdown, we did not publish the January issue of the Bulletin. We regret any inconvenience.

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Upcoming events:

- *Jun. 10-14, Surface Blast Design Field Course, Mt. Sterling, IL*
- *Jun. 19-22, National Minerals Education Conference 1996, Red Lions's LaPosada Resort, Phoenix, AZ*
- *Jun. 21-22, Thirteenth Annual Meeting of West Virginia State Council of the HSA, Glade Springs Resort. WV*
- *Jul. 16-18, Richlands Coal Show, Southwest Virginia Community Coll., Richlands, VA*
- *Aug. 14, Small Mines H&S Seminar, PSU, State College, PA*
- *Sep. 4-11, SME Mfg. Conf., Chicago, IL*