BULLETIN

HOLMES SAFETY ASSOCIATION

E PLURIBUS UNUM

SAFETY EFFICIENCY

MINERAL INDUSTRIES

November 1994

contents

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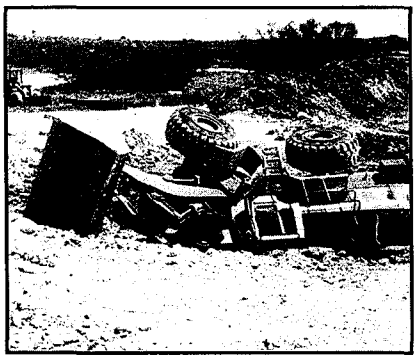

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Please note: The views and conclusions expressed in HSA Bulletin articles are those of the authors and should not be interpreted as representing official policy of the Mine Safety and Health Administration.

KEEP US IN CIRCULATION

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.

MSHA customer service contract

United States Department of Labor
Mine Safety and Health Administration

Our Mission:

The Mine Safety and Health Administration (MSHA), through enforcement of the Federal Mine Safety and Health Act of 1977 (Mine Act), and cooperative efforts with the American mining community, works to eliminate fatalities, reduce the frequency and severity of accidents, and minimize health hazards; thereby making mines safe and healthy places of work for our customers, America's nearly 400,000 mine workers. The goal of MSHA's mission is to create an environment where miners can spend their working lives without serious injury or impairment of health, and mining families can have confidence that miners do not have to risk life and limb in order to make a living.

Our Services:

The first, and most critical, step in protecting the lives of our Nation's miners is to conduct all of the activities mandated by the Mine Act, which include inspecting approximately 15,000 mining operations, in accordance with the provisions of the Mine Act, every year. Our comprehensive enforcement mandate includes full inspections of all mines, as well as complete investigations which are prompted by accidents, by safety and discrimination complaints, and special investigations where there is evidence of knowing or willful violations of safety and health laws.

What Miners Can Expect from MSHA:

Mandatory Complete Mine Inspections

We will conduct complete inspections at all available underground mines four times a year and at all available surface mines two times a year.

We will examine our mandatory regular inspection process to insure the quality, flexibility, and consistency of our enforcement process.

Other Mandatory Inspection and Investigations

We will complete other mandatory inspections and investigations as provided for in the Mine Act including: initiating investigations of all miners' complaints of safety or health hazards normally within 24 hours; and initiating investigations of written complaints of discrimination within 15 days of receipt. If you believe that a safety or health hazard exists at your mines, you can call MSHA toll-free at 1-800-746-1554—you do not need to give your name.

Quality and Delivery of Training Products and Materials to the Customer

We will emphasize mine-specific and on-site miner training when we evaluate proposals to provide training to miners from state mining departments and others (MSHA State Grants Program).

Communication between MSHA and the Customer

We will hold rulemaking hearings and topical health and safety conferences to provide forums for open discussion of health and safety concerns. We will consistently hold these events in the mining regions.

We will work with state and local institutions and associations to provide miners with useful, understandable information about mining health and safety.

If You Have Questions, Comments or Need Information:

You can call the MSHA District Office nearest to you:

Coal Mine Safety and Health

District 1, Wilkes-Barre, PA: 717-826-6321
District 2, New Stanton, PA: 412-925-5150
District 3, Morgantown, WV: 304-291-4277
District 4, Mt. Hope, WV: 304-877-3900
District 5, Norton, VA: 703-679-0230
District 6, Pikeville, KY: 606-432-0943
District 7, Barbourville, KY: 606-546-5123
District 8, Vincennes, IN: 812-882-7617
District 9, Denver, CO: 303-231-5458
District 10, Madisonville, KY: 502-821-4180

Metal and Nonmetal Mine Safety and Health

Northeastern District, Mars, PA: 412-772-2334
Southeastern District, Birmingham, AL: 205-290-7294
North Central District, Duluth, MN: 218-720-5448
South Central District, Dallas, TX: 214-767-8401
Rocky Mountain District, Denver, CO: 303-231-5465
Western District, Vacaville, CA: 707-447-9844

To report an accident, call your MSHA office—or call 1-800-746-1553 (24-hour).

To phone in health or safety concerns anonymously—call 1-800-746-1554 (24-hour).

Holmes Safety Association Monthly safety topic

Fatal haulage accident

GENERAL INFORMATION: A 45-year old utility man with 20 years of mining experience, 14 months experience at this classification, lost his life when he became entangled in a reenergized belt during an inspection/repair operation.

The mine is opened by 7 shafts into the Pocahontas No. 3 Seam which averages 60 to 84 inches in height. There are 382 employees at the mine. A total of 331 persons work underground on three production shifts per day, five to six days per week. The mine has six developing sections utilizing continuous mining systems and two retreating sections utilizing longwall shearer systems, which collectively produce an average of 20,000 tons of coal daily.

DESCRIPTION OF ACCIDENT: The evening shift utility crew received their work assignments from the shift mine foreman. Upon receiving their work assignments, the utility crew traveled underground at about 4:00 p.m. Their work proceeded normally until about 8:30 p.m. when the No. 1 conveyor belt on 3 North Mains became overloaded and spilled coal. A utility person who was stationed at the No. 1 belt drive, turned the belt off when the spill occurred.

The assistant shift mine foreman was notified of the spill and was informed of an unusual amount of slack in the No. 1 conveyor belt when it was running loaded.

When the assistant shift foreman and another utility person, who was traveling with the assistant shift foreman at the time, arrived at the No. 1 belt drive, they determined that the belt take-up unit had not reset when the conveyor was started, resulting in excessive slack in the belt.

The shift mine foreman was on the 9 Northeast Development section when the belts stopped. He contacted the utility person at the No. 1 belt drive to find out why the belts had stopped. He then contacted the victim, who was working at the No. 3 belt drive, and told him to be sure to turn the belts off.

After further conversation with the utility person concerning the situation and upon learning there was no one at the No. 2 belt drive, the shift mine foreman again contacted the victim and told him to be sure to turn off the No. 2 belt. At that time, the victim told him he had to cut a piece of rubber. The shift mine foreman told the victim to get back to the phone as soon as possible because they were getting ready to start the No. 1 belt.

Meanwhile, and with no knowledge of the conversation between the shift mine foreman and the victim, the assistant shift foreman and a utility person reset the No. 1 conveyor belt take-up unit. The assistant shift foreman instructed the utility person to start the No. 1 conveyor belt. The utility person announced over the mine phone his intention to start the belt, repeated his announcement, and started the belt at about 8:40 p.m.

The belt had been running for about 7 minutes when another utility person, who was cleaning along the No. 1 conveyor belt on 3 North Mains, noticed what appeared to be a hard hat with a mining light attached, pass on the conveyor belt. He immediately turned off the conveyor belt and contacted the assistant shift foreman by mine phone notifying him of his findings. The assistant shift foreman contacted the shift foreman by mine phone, informing him of the situation. They then proceeded to the area the victim had been assigned to work.

They both arrived at the accident scene at about the same time and began to search for the victim. The victim was found between the bottom belt of the No. 2 conveyor belt and a top belt roller at a location about 19 feet inby the No. 3 belt drive. CPR could not be administered due to the extent of the victim's injuries.

The victim was transported to the surface and transported by ambulance to the Medical Center where he was pronounced dead on arrival.

CONCLUSION: The fatality occurred when the utility man (beltman) became entangled between the moving belt and a top belt roller. The most probable cause of the accident was failed communications between miners in different areas of the mine that permitted the victim to be in an unsafe position when the conveyor belt was started. The location of the No. 2 belt switch probably contributed to the victim being in an unsafe position. HSA

Explosion at Blue Canyon Mine kills 23; April 18, 1895

Lake Whatcom, WA—Between 2 and 3 pm an explosion killed 23 of the 25 men in the mine. A hole drilled in the bottom rock had been charged with giant powder and fired. The hole had been poorly directed and did not break, but the blast ignited gas and dust. The explosion was not widespread, and the men died mainly from asphyxiation. Gas was evident in quantity and under pressure in the strata. Most of the men descended to the gangway and were overcome there.

Reprinted from Bureau of Mines ***Bulletin 586***

Meeting the challenge of serious safety problems at small coal mines

Jack Tisdale, MSHA Coal Mine Safety and Health

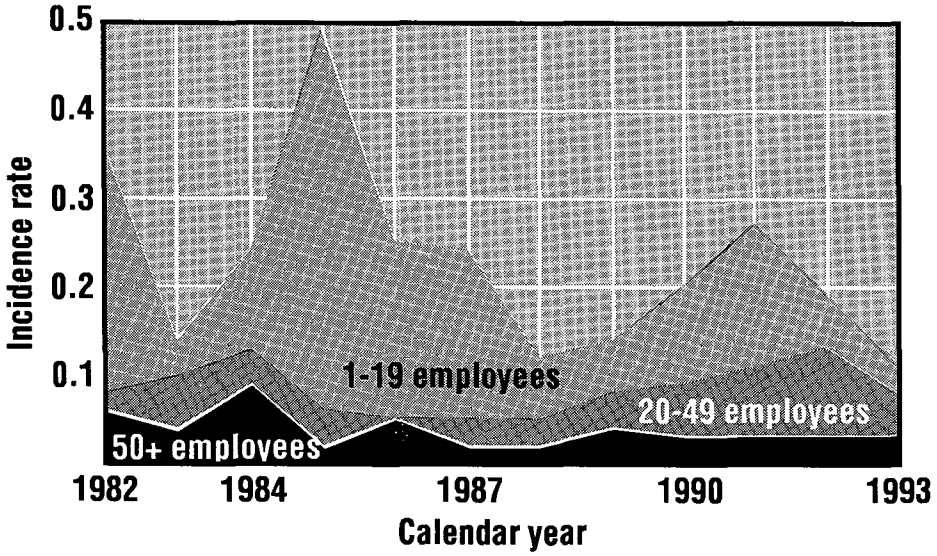
It has long been apparent from accident and injury statistics that small coal mines employing 50 or fewer employees experience a disproportionate number of serious and fatal accidents compared with larger operations. For example, in 1992, small underground coal mines, with fewer than 20 employees, had a fatal incidence rate of about 6 times that of larger mines, and those with more than 20 but fewer than 50 employees had a rate about 4 times that of larger mines.

Clearly, bringing down the toll of miners lost in small mine accidents has been one of the most difficult challenges facing federal and state safety and health regulators and the coal mining industry. A strong, consistent multi-sided approach seems the only avenue to achieving significant safety gains.

In response to the problem, the Mine Safety and Health Administration (MSHA) has developed and is focusing increasingly on procedures for improving safety in the following major areas involving small, underground coal mining:

- Enforcement procedures;
- Mine operator assistance;
- Financial ties;
- State grants; and
- Collection of fines for violations.

FATALITY RATES
Underground coal mines by mine size, 1982-1993



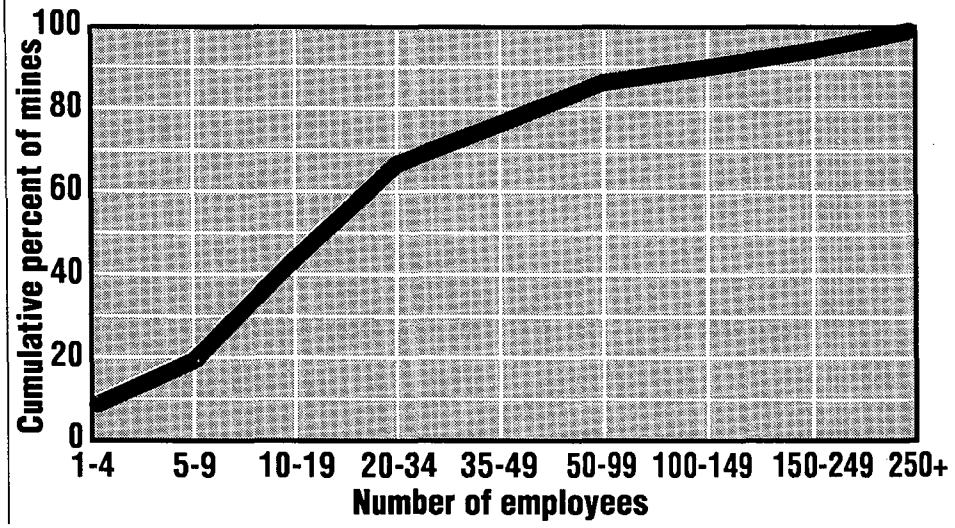
Enforcement procedures

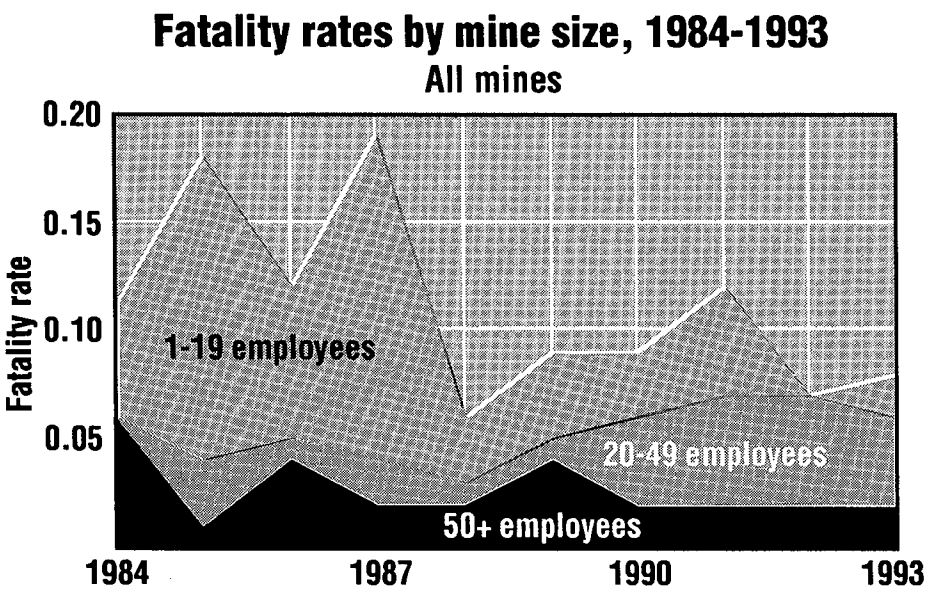
Following multiple fatality accidents at two small coal mines, internal reviews were conducted by MSHA that identified the need for improvement of enforcement efforts at small mines. In reevaluating its coal mine enforcement strategy, the Agency concluded that it should focus more strongly on basic inspection activities. Accordingly, mandated regular inspections (AAA) along with 103(i) inspections constitute MSHA's core business and have the highest priority. In addition, MSHA recognizes the following categories as priority activities:

- Plan approval activities;
- Accident investigations;
- Special investigations;
- 104(e) pattern of violations; and
- 103(g) inspections.

MSHA recognizes its responsibility to make thorough, complete inspections at all mines, regardless of size. The Agency has directed its management to improve enforcement at smaller mines through improved oversight procedures (PIL I93-V-8, 06/07/93). In addition, MSHA has established procedures for district managers to identify problem mines for increased inspection activity, including the types of inspection activities that should be considered. These procedures allow district manag-

Percent of underground coal mines by size group, first quarter 1993





ers to determine appropriate inspection activities for problem mines that lead to increased inspector presence, thereby improving the level of compliance at these mines (PIL I93-V-2, 01/11/93).

Management oversight procedures include: supervisors traveling with inspectors; supervisors debriefing inspectors after each inspection; review of citations and orders for appropriateness; rotation of inspector assignments; conduct of compliance follow-up inspections; and enforcement sanctions where operator compliance is deficient.

Increased inspector presence activities include: "impact" inspections at irregular intervals with at least two inspectors; "stretch" inspections in which an inspection is spread over a period of time; additional spot inspections; inspectors traveling in pairs to offset intimidation where it might exist; and group inspections.

Information considered when determining whether to apply increased inspection time is: the mine's compliance history; the accident and injury rate along with the number and types of injuries; mine management's safety efforts, such as procedures used in the mine, the quality and type of instructions given the workforce, and training provided to the employees; and management's involvement or commitment to the safety and health of the miners.

Mine operator assistance

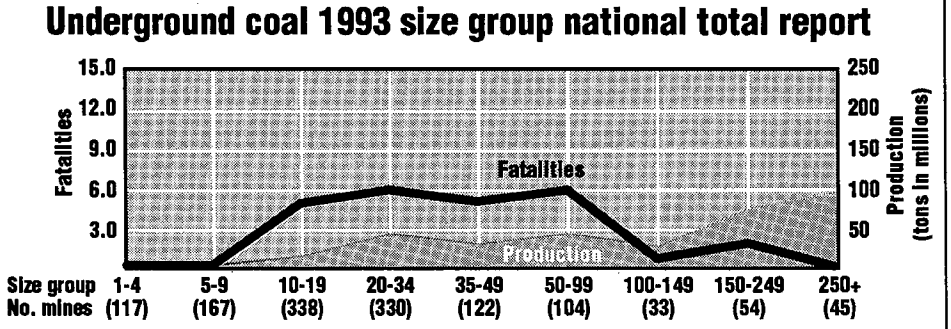
MSHA's responsibility is to enforce the Mine Act and regulations through fair and impartial inspections. It is understood that mine operators are responsible for their compliance with health and safety regulations and safety records, and should take whatever actions are necessary to make needed adjustments. MSHA expects improvements at mines with poor compliance histories and will assist mine operators where possible. The Agency has a number of programs available to assist mine operators in improving compliance. They are the:

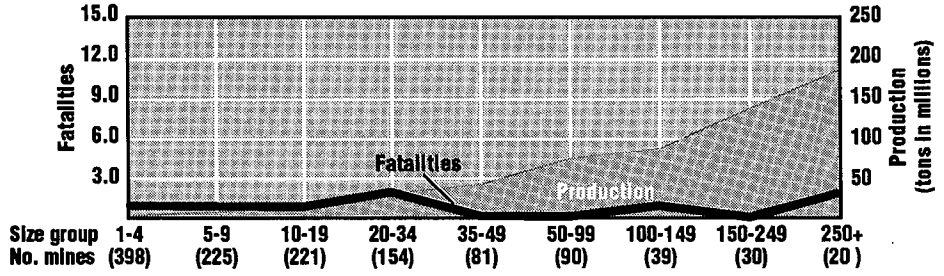
- Job Safety Analysis program;
- Joint Mine Assistance program;
- Small Mines Training Initiative;
- Technical assistance in mine ventilation, respirable dust, or roof control;
- Accident analysis; and
- Discussions with MSHA mine inspectors, supervisors, and subdistrict and district managers.

MSHA has entered into several agreements with four states to provide assistance to mine operators. These agreements are covered by the Joint Mine Assistance (JMA) program which is a coordinated effort conducted with the state mining authorities of Kentucky, Pennsylvania, West Virginia, and Virginia.

The objectives of this program are to enhance cooperation and improve the coordination of resources between the states and MSHA. It is an effort to provide increased assistance to the mining industry in reducing serious and fatal accidents and improving compliance performance with state and federal mining laws and regulations.

Working together, the mining industry, the states, and MSHA identify mines that need assistance in accident reduction and/or regulatory compliance. Eligibility for inclusion in the JMA program may be based on several factors including: accident history; specific mining problems and/or conditions inherent to the mine; regulatory compliance history; availability and coordination of technical assistance within the mine operator's organization; effectiveness of the operator's mine plans and training





plans; and prior efforts of the agencies to provide assistance.

Once a determination has been made to target a mine for the JMA program, MSHA, the state and mine operations personnel discuss methods to be used to achieve improvement.

Methods for improving a mine's safety performance and accident record may include any/or all of the following: providing technical aid in solving specific mining problems; providing assistance to develop and implement training programs to address specific problems; using MSHA Education and Training staff to carry out the Job Safety Analysis program; provision for joint review, revision, and approval of mine plans; coordination of inspection activities; providing added and/or specialized inspections when necessary; and periodic review to identify additional needs and determine future direction.

Financial ties

Business arrangements of small mine operators can be an important factor in the safety and health of mine operations. Small operations may be controlled by higher authority obscured by organizational arrangements, to the extent that the local person in charge lacks authority to make needed decisions to react to safety and health issues.

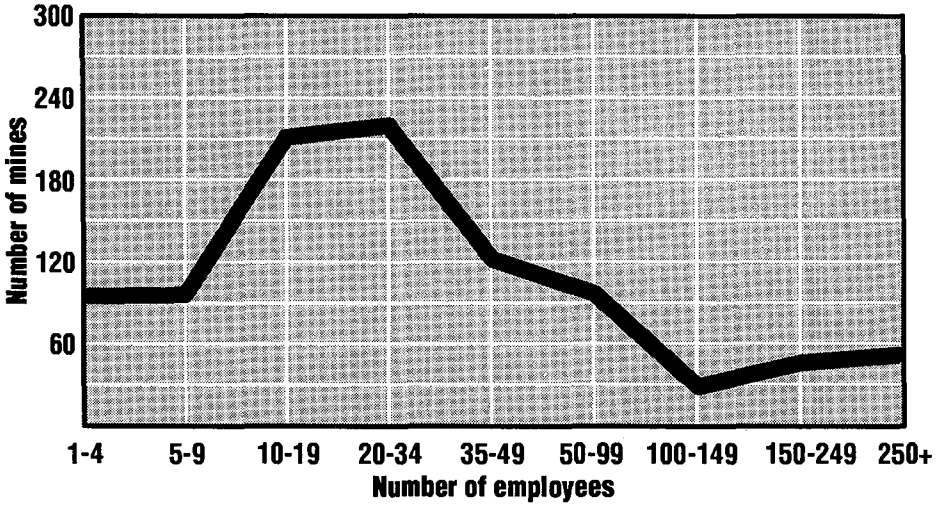
For example, disapproval of purchases by some distant authority can result in poor maintenance of mining equipment. Safety can be significantly compromised when local management is responsible for safe mining operations but lacks the authority for that responsibility.

A business arrangement of particular concern is that in which a larger company employs a contract mining company to insulate the larger company from MSHA civil penalty assessments. These smaller operators often refuse to pay civil penalty assessments, then quickly go out of business before the civil penalties are collected, only to be replaced by another small operator. This cycle can be repeated with the larger company subsequently hiring other small contract mine operators to enter the mine site and extract the coal.

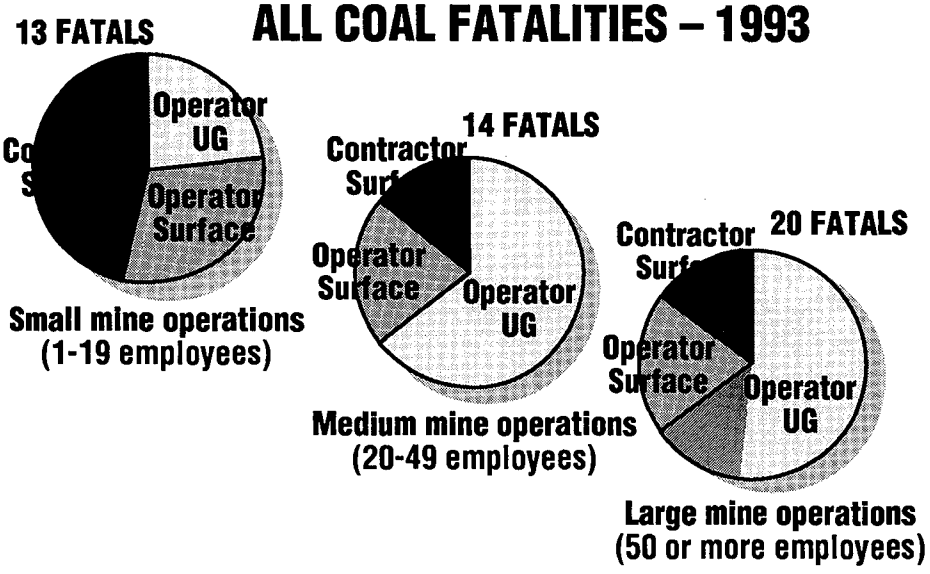
Where MSHA finds that the contracting company's control is enough and available information is such that the contract company can be classified as a "co-operator" under Section 3(d) of the Act, MSHA will then cite both the contract miner and the contracting entity.

It is important that MSHA continue to explore and uncover business arrangements that adversely affect the safe operation of the mine. Larger contracting entities may exercise control over mining operations that limit local management from exercising full authority over purchasing, planning, or mine operational scheduling without appropriate knowledge or concern for the effect this control has on safety.

Number of underground coal mines by size group, first quarter 1994



ALL COAL FATALITIES – 1993



State Grants

In view of the poor safety record of small mines generally, MSHA has determined that applications for grant funding, from states in which coal is mined, must concentrate on accident reduction programs at small coal mines.

Each state applying for federal assistance under the MSHA State Grants program is required to describe in detail how it will address health and safety issues and is encouraged to give a high priority to education and training projects aimed at reducing deaths and serious injuries at smaller operations and several other high-risk mining areas. Applications will be evaluated to determine how compre-

hensively each addresses those priority issues and other activities to be performed under the grant. MSHA is interested in grant programs which use innovative training techniques, provide for mine specific training, and result in improved safety management.

Collection of penalties

MSHA has taken a number of steps to ensure the civil penalties assessed against mine operators are paid. Each proposed assessment is sent by certified mail, return receipt requested, to mine operators. The operators have 30 days to either pay or initiate a contest of the assessment. Those who fail to do either are sent a payment demand letter. Follow-up activities to collect delinquent civil penalties from non-payers include a field collection program. Under this program civil compliance specialists are stationed in MSHA coal districts having the highest concentration of active mines and delinquent debt, Districts 4, 6, and 7. These specialists meet face-to-face with mine operators or their representatives in Kentucky, West Virginia, and Virginia to collect delinquent penalties. They also provide assistance and advice to operators on how they can reduce the amount of future civil penalties through improved compliance. They do investigations and work directly with the U.S. Attorney in their jurisdiction on those delinquent civil penalties cases referred for enforced collection in U.S. District Court.

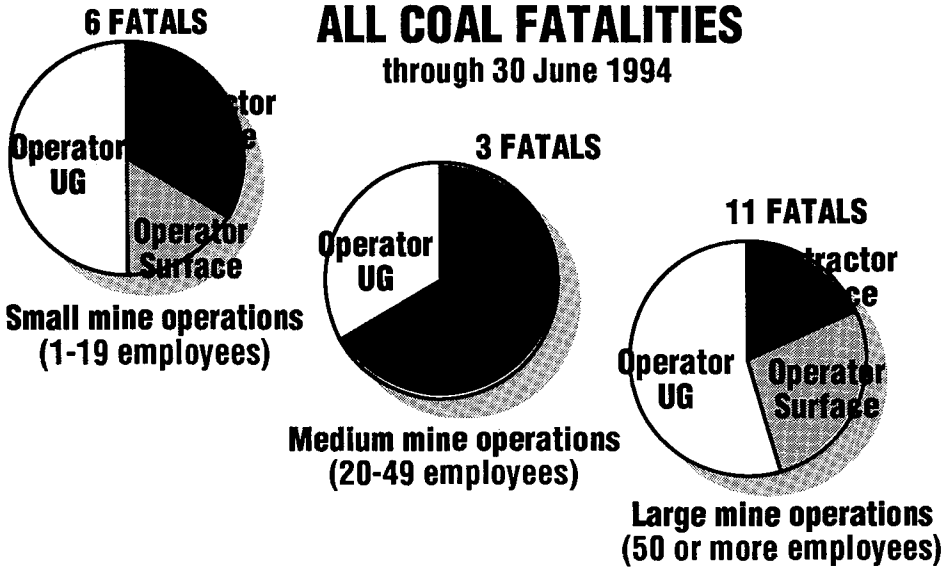
In the remaining districts, a contract debt collection agency is used to attempt collections. This debt collector has 180 days to collect on accounts referred to them. Uncollected accounts are returned to MSHA's Civil Penalty Compliance Office (CPCO), and after further research, cases meeting specific criteria are referred to the U. S. Attorney for enforced collection in District Court.

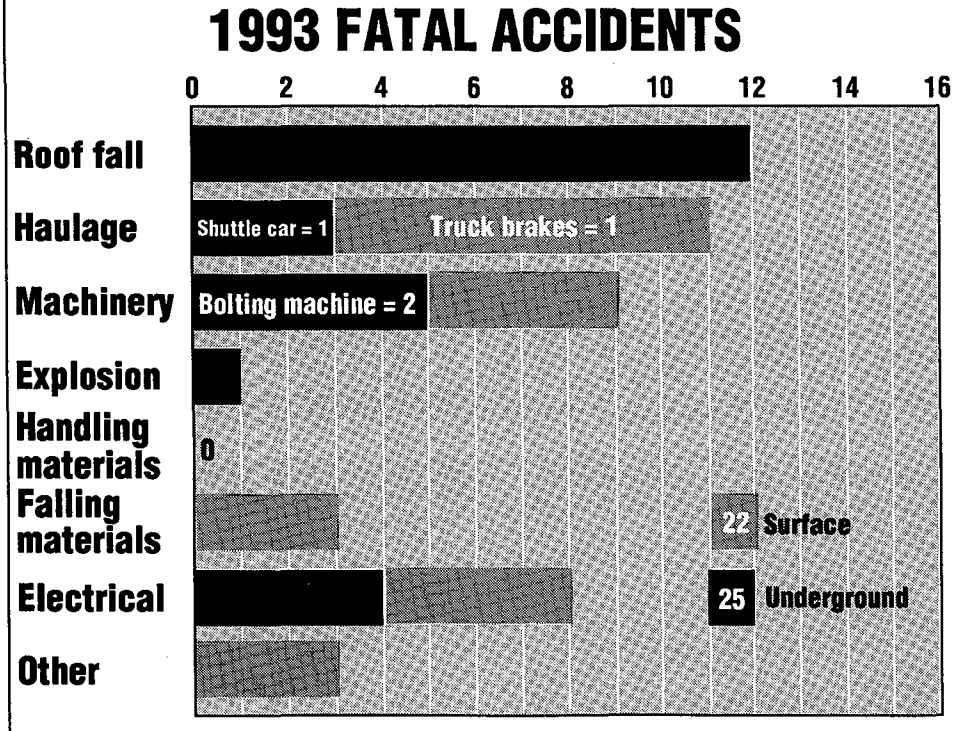
Staff members in MSHA's CPCO monitor the above activities and pursue contact with debtors one last time before referral to the U. S. Attorney.

As part of its collection activities, MSHA has established excellent working relations with the U.S. Attorneys nationwide. Because the Department of Justice litigates for all government agencies, enforced collections oftentimes get displaced by other pressing matters before Justice. Therefore, the Special Collections Section of MSHA's CPCO, in cooperation with the MSHA Solicitors Office, prepares all legal papers required for collection in U.S. District Court. MSHA also provides resources to serve summons and other papers related to enforcement collection cases, as well as oversee those cases where seizure of assets is appropriate.

MSHA maintains an excellent relationship with the Office of Surface Mining personnel and has on-line access to their Applicator Violator System to ascertain ties between companies that may not be readily apparent from MSHA records. This research can lead to co-citing each company for violations and has led to collection of delinquent penalties for "hidden" companies. HSA

Reprint of a paper delivered by Jack Tisdale of MSHA at the VPI Annual Institute on Mining Health, Safety, and Research on September 1, 1993. Some of the graphics have been updated to reflect more current information.





Hot work fire safety

By G. Lee Clark

Historically, cutting, welding, and other temporary "hot work" have resulted in a significant number of major fires and explosions. These incidents can be attributed to improper fire safety precautions, such as failure to remove flammable/combustible materials prior to commencing work activities; not covering materials that cannot be removed with fire-resistant shields; inadequate fixed and portable fire extinguishing equipment; absence of fire-watch personnel during hot work; and failure to inspect the area following project completion.

Implementing adequate controls over hot-work fire hazards requires management to develop safe work procedures. These procedures apply to any temporary hot work (i.e., cutting, welding, brazing, soldering, grinding, or torch-applied pipe thawing or roofing operations). They also apply to use of non-explosion-proof electrical equipment, portable power tools, air hammers, and other power-actuated tools in potentially hazardous flammable/explosive atmospheres. These controls should be applied to work performed by both employees and contractors.

Hot-work permit system

Property and plant management should oversee the permit-issuance system and designated supervisory personnel should issue the permits—only after certain precautions are followed. Prior to permit issuance, a supervisor's pre-work evaluation, worksite inspection, and fire protection evaluation must be completed and filed.

Pre-work evaluation

Answer these questions. In doing so, reasons to cancel proposed hot work may be discovered:

- Can this job be avoided? Does a safer procedure exist?
- Can work be moved to a maintenance area where hot work can be safely performed?
- Should the proposed work area be designated "off limits to hot work"?
- Are hot-work personnel properly trained and authorized?

References:
NFPA 51B, Standard for Fire Prevention in Use of Cutting and Welding Processes
29 CFR 1910.252(a)

This is a sample hot work permit form.

HOT WORK PERMIT

NOTE: Before issuing this permit, all of the precautions described in Company SOP should be followed.

Both sides must be completed

Good for **this** shift **ONLY** _____ *date*

From _____ *time* to _____ *time*

Bldg. _____ Dept. _____ Floor _____

Work to be done: _____

_____

_____

_____

Work performed by: _____

Fire watch assigned? Yes ☐ No ☐

Names of fire watches: _____

_____

Other special precautions taken: _____

_____

_____

_____

I have been instructed and I understand the hazards as well as the precautions necessary to do this work.

_____
Signature of person performing work

I verify that the work site has been inspected, all necessary precautions have been taken to prevent fire, and the individual signed above is authorized to do this work.

_____
Signature of supervisor

_____
Date and time of signature

Side 1

1. Have all flammable or combustible materials been removed from the work area (35' radius)? Yes ☐ No ☐
2. If any flammables or combustibles cannot be removed, have they been properly covered by fire-resistive shields or tarpaulins? Yes ☐ No ☐
3. Are fire extinguishing systems in service? Yes ☐ No ☐
4. Are adequate portable fire extinguishers and/or hoses provided? Yes ☐ No ☐
5. Have combustible floors or roofs been wet-down and/or properly covered? Yes ☐ No ☐
6. Have wall or floor openings been properly covered? Yes ☐ No ☐
7. Is hot work equipment in good working condition? Yes ☐ No ☐
8. Is a confined space permit required? Yes ☐ No ☐
9. Is a line breaking permit required? Yes ☐ No ☐
10. Is lock-out/tag-out required? Yes ☐ No ☐
11. Has the atmosphere been checked with a combustible gas detector? Yes ☐ No ☐
12. Is ventilation adequate? Yes ☐ No ☐
13. Is adequate PPE provided (glasses, mask, gloves, breathing apparatus)? Yes ☐ No ☐

Work completed _____
Date/time

I have inspected the work site after completion of the work and find the area to be in safe condition.

_____
Signature of supervisor

_____
Date and time of signature

Side 2

• Are fixed fire protection systems functioning? Will they continue to function during and after hot work operations?

Worksite Inspection

The following questions may uncover unsatisfactory worksite conditions that must be corrected before issuing a permit:

Is approved equipment provided? Is it well-maintained?

• Is gas-cutting and welding equipment properly secured to prevent upset? Is it located away from possible damage?

• Are combustibles or flammables located within 35 feet of the work area? If they cannot be removed, are they adequately covered by metal shields or fire resistant tarps?

• Does the work atmosphere contain flammable/explosive vapors? If so, has the area been properly cleaned and purged? Has air sampling been performed using approved equipment? Are combustible vapors less than 10 percent of lower explosive limit (LEL)?

• Have vessels containing flammable or combustible materials been drained, cleaned, purged, and tested for flammable vapors? Has transfer piping been drained, purged, and blanked?

• Are combustible floors or roofs present? Have they been wet-down and/or covered with metal shields or fire resistant tarps?

• Have wall and floor openings been covered with non-combustible shields?

• Are walls and ceilings in the area combustible?

Fire protection evaluation

Work should not be performed if fixed fire protection systems are malfunctioning. To evaluate worksite protection, answer the following questions:

• Are control valves for fixed protection systems fully open?

• Are portable fire extinguishers and/or charged fire hoses adequate?

• Are fire-resistant tarps suspended beneath the work area as needed?

• Is mechanical ventilation and/or combustible gas monitoring equipment provided?

• Is trained fire-watch personnel at the worksite? In adjoining areas or on lower floors?

Permit Issuance

A hot-work permit should be issued only after the described precautions are met. After assigning fire-watch personnel, the supervisor should sign the permit and issue it to the authorized hot work employee. The permit must be posted at the worksite; it should expire no later than the end of the authorizing supervisor's shift.

Fire-watch personnel should be ready to extinguish sparks that could ignite combustibles; adjust protective shields or tarps as necessary; observe and confirm proper grounding for electrical hot work equipment; and sound the fire alarm if needed.

Immediately after project completion (no more than 31) minutes), the supervisor should inspect the worksite and relieve fire-watch personnel. The permit must be signed again to verify that the area is safe; it should also be filed for documentation purposes. The work area should be periodically inspected at least four hours after work completion to check for smoldering fires. HSA

G. Lee Clark, CSP, is a Murrysville, PA-based self-employed safety/loss control consultant in western Pennsylvania. Clark has more than 17 years' experience in the field, including four years with the U.S. Air Force as a fire protection specialist. He holds a B.S. in Education from Duquesne University and an M.S. in Safety Sciences from Indiana University of Pennsylvania. Clark is a Professional Member of ASSE's Western Pennsylvania Chapter.

Reprinted from the journal of the American Society of Safety Engineers' December 1993 issue of ***Professional Safety****.*

Mine operations recognized for outstanding safety records

Eight mining operations have been honored for their outstanding 1993 safety records in the annual Sentinels of Safety awards program sponsored by the U.S. Department of Labor's Mine Safety and Health Administration (MSHA) and the American Mining Congress (AMC).

"The workers and companies who received Sentinels of Safety awards deserve our highest praise," said Robert B. Reich, Secretary of Labor. "They demonstrate to the industry that a commitment to sound safety programs and training reduces disabling accidents."

"The Sentinels of Safety trophy is the most prestigious award in the mining industry," said J. Davitt McAteer, assistant secretary of labor for mine safety and health. "It is awarded to those mines with the best safety records in the country and reminds all of us that working in mines can be a safety occupation."

The sentinels award is the oldest established award for occupational safety. The first Sentinels of Safety award was announced by former President Herbert Hoover, a mining engineer, when he was Secretary of Commerce in 1925. The annual safety competition has continued uninterrupted to the present day.

Mining companies in various operational categories were recognized for achieving the greatest number of employee work-hours in 1993 without an injury that resulted in lost workdays. To have qualified, a company had to compile at least 30,000 employee work-hours during the year without a lost-time injury or fatality.

First place winners and their number of consecutive employee-hours recorded in each of the MSHA/AMC sponsored mining categories are:

Underground Coal Group
Mine No. 4A—No. 2 Portal, D & K Coal Co., Birch River, WV 132,254 hours.

Surface Coal Group
Trapper Mine, Trapper Mining Inc., Craig, CO 337,125 hours.

Underground Metal Group
Sweetwater Unit, ASARCO Inc., Bunker, MO 260,698 hours.

Underground Nonmetal Group
Oakfield Mine, United States Gypsum Co., Oakfield, NY 144,159 hours.

Open Pit Group
Cyprus Sierrita Corp., Cyprus Climax Metal Co., Green Valley, AZ 741,966 hours.

Quarry Group
F E C Quarry, Rinker Materials Corp., Hialeah, FL 210,872 hours.

Sand and Gravel Bank or Pit Group
Arena Plant, Pioneer Concrete of Texas, Inc., Altair, TX 130,401 hours.

Sand and Gravel Dredge Group
Bridgeburg Dredge & Mill, Glacial Sand & Gravel Co., Kittanning, PA 82,217 hours.

Other mining operations with exceptional safety records during 1993 included the following:

Underground Coal Group
No. 1 Mine, Cherry Point Coals Inc., Gilbert, WV 115,131 hours.
Benco No. 2, Benco Mining Inc., Hazard, KY 110,431 hours.
Sterling North Mine, Sterling Mining Corp., North Lima, OH 90,326 hours.
1-C Mine, Martin County Coal Corp., Inez, KY 83,336 hours.

Surface Coal Group
Rochelle Mine, Powder River Coal Co., Gillette, WY 321,230 hours.
La Plata Mine, BHP Minerals, Farmington, NM 233,457 hours.
Medicine Bow Mine, Arch of Wyoming, Inc., Hanna, WY 214,832 hours.
Buckskin Mine, Triton Coal Co., Gillette, WY 195,094 hours.

Underground Metal Group
Immel Mine, ASARCO Inc., Strawberry Plains, TN 166,790 hours.
West Fork Unit, ASARCO Inc., Bunker, MO 154,767 hours.
McCoy/Cove Underground, Echo Bay Minerals Co., Battle Mountain, NV 77,837 hours.
Cumberland Mine, Jersey Miniere Zinc, Carthage, TN 46,199 hours.

Underground Nonmetal Group
Sperry Mine, United States Gypsum Co., Sperry, IA 121,322 hours.
Shoals Mine, United States Gypsum Co., Shoals, IN 84,347 hours.
Kentucky Avenue Mine & Mill, Martin Marietta Aggregates, Indianapolis, IN 74,531 hours.
Thomasville Mine 1, 2, & 3, Thomasville Stone & Lime Co., Thomasville, PA 64,571 hours.

Open Pit Group
Barrick Mercur Gold Mine, Barrick Resources (USA) Inc., Toole, UT 184,496 hours.
Rain Mine, Lost Dutchman Construction, Inc., Sparks, NV 177,765 hours.
Glenbrook Nickel Mine, Glenbrook Nickel Co., Riddle, OR 175,328 hours.
Castle Mountain Mine, M K Gold Co., Searchlight, NV 173,391 hours.

Quarry Group
Reed Quarry, Vulcan Materials Co., Gilbertsville, KY 134,577 hours.
Sylacauga Quarry, ECC International, Sylacauga, AL 112,441 hours.
Brooksville Gregg Mine, Florida Crushed Stone Co., Brooksville, FL 110,462 hours.
Miramar Rock, Miramar Lakes Inc., South Florida, FL 101,740 hours.

Sand and Gravel Bank or Pit Group
Sun Valley Plant, Calmat Co. Sun Valley, CA 116,608 hours.
Chipley Plant, The Fordyce Co., Victoria, TX 98,291 hours.
Plant #1, The Tanner Companies United Metro Materials, Phoenix, AZ 97,846 hours.
Grove Stone Quarry, Grove Stone & Sand Co., Swannanoa, NC 91,402 hours.

Sand and Gravel Dredge Group
Brazos Plant 02-06, Pioneer Concrete of Texas, Inc., Brookshire, TX 51,883 hours.
Greenville Plant and Dredge, Greenville Gravel Co., Greenville, MS 51,510 hours.
Northern Gravel Plant & Dredge, Northern Gravel Co., Muscatine, IA 51,327 hours.
A Tower, Standard Sand & Silica Co., Davenport, FL 50,999 hours.

Reprinted from a U.S. Department of Labor news release dated July 11, 1994.

Emergency response planning

By Michael J. Brnich, Jr., Mining Engineer, Launa Mallett, Research Sociologist, and Charles Vaught, Research Sociologist
Pittsburgh Research Center, U.S. Bureau of Mines, Pittsburgh, PA.

Large-scale mine emergencies are infrequent events and so it is difficult to put daily concerns aside to focus attention on them. They do, however, occur with results that can be devastating economically for the mining operation, and economically as well as emotionally for the individuals involved. These consequences can be mitigated with even limited emergency response planning. When an incident occurs at a site, there will be an effort to rescue victims, get medical assistance, clean up the affected area, correct all hazards, and return the mine to production as soon as possible. If each of these activities must be planned as it is conducted, valuable time will be lost and responders who are under stress because of the event may not be able to make the best possible decisions. If emergency response planning is done before an event happens, it will be less difficult and take less time to return the mine to normal operation.

The insights about emergency response planning contained in this article come from information that was obtained during Bureau of Mines research that has been conducted over the past four years. The work is part of an overall Bureau effort to improve the efficiency and effectiveness of emergency response activities and thereby protect potential victims and response personnel. The authors have reviewed literature that addresses all types of emergency response. They have also conducted in-depth interviews with twenty-eight individuals who have extensive experience managing large-scale mine emergencies and ten people who played key roles in responding to a major mine fire. This paper is based on preliminary analyses of these data.

How much emergency preparation is needed?

Rules and regulations only specify what is acceptable at a minimum. Policies attempt to ensure compliance under real world conditions. Strictly adhering to what is legally required in the way of mine emergency planning may offer enough protection for small-scale accidents or situations in which an evacuation can be accomplished easily. When something more serious occurs, however, minimal planning will provide only for minimal activities related to mine evacuation, obtaining medical attention for any injured workers, and calling for assistance from a mine rescue team. There are no requirements to plan for a well-coordinated response which can protect personnel and return the mine to routine production in an efficient manner.

There is a wide range of possible emergencies that can be encountered at a mine site. Many mining companies have not developed formal plans for dealing with these potential events. Instead, they have relied upon the skills of upper level mine managers and others in analyzing and responding to emergencies as they have arisen. In some cases, these informal procedures have worked well and many events have been managed successfully without the use of a formal emergency plan. At the same time, however, managing a mine emergency without a formal plan can pose great risks and result in poor handling of the event. There may be mine emergencies that exceed the technical capabilities of initial responders. In some events the best technical people can become involved in front line rescue or exploratory work when they could be better utilized in response planning and coordination. A disaster may incapacitate or kill key management officials. In other cases, the emergency can be of such magnitude that successful management requires sizable outlays for personnel, materials, technical advisors and services of external organizations. One way to be prepared is to develop an Emergency Response Plan.[1]

An Emergency Response Plan is an all-encompassing document. It covers many aspects of response, including the following: 1) mine or area evacuation; 2) setting up site security; 3) dealing with the media; 4) providing information to family members; 5) determining where cars ought to be parked to lessen traffic problems; and 6) scheduling shifts for workers, including decision-makers. There are many other aspects of response that should be considered but the resulting plan should not be an encyclopedia that is too long and complex to understand. Instead, the plan should be a living document that is kept up-to-date, gets tested and refined during practice, and is useful if it is ever needed. Selected details of what goes into a plan will be discussed later. The first step in planning, however, is to decide that simple adherence to the laws regarding emergency response will not offer as much protection to a mine and the people who work there as is possible. Next, one must be willing to allocate resources to go that extra step toward being prepared for a large-scale mine emergency.

Topics to include in an emergency response plan

Adequate mine emergency plans need to be suitable for use in managing any situation that could arise at a mine. These range from easily foreseen predicaments such as fires, explosions, inundations, or roof fall entrapments to less probable events such as a hazardous chemical spill. If a mine emergency plan is well prepared, it can cover the worst foreseeable situation. And, if it is designed to utilize all available resources in order to achieve predefined objectives, then it is likely

[1] *An example of a comprehensive written plan can be found in the paper "Emergency Response Planning: Who Needs It?", L. Mallett, M. Brnich, Jr., and C. Vaught in* ***Improving Safety at Small Mines,*** *SP18-94, Bureau of Mines.*

that the basic plan can be adapted to cover a wide range of possible emergency situations. The scope of this article does not permit the presentation of detailed descriptions of all of the elements of a mine emergency plan. This section, however, provides insight regarding some of the major components that comprise a basic Mine Emergency Response Plan. The ideas presented were taken from the interviews discussed above and from related literature.

Plan objectives—A mine emergency plan must contain clearly defined objectives for each portion. If objectives are considered carefully and defined as an integral part of planning, then all individuals engaged in developing the plan, training in its use, or implementing it in an emergency will be better prepared to respond. Quite often, major events are handled initially by individuals who have little or no experience in dealing with a mine emergency. Determining the objectives and stating them within the plan helps personnel with less knowledge and experience deal with the emergency.

Initial response to the emergency—As soon as possible after the onset of an emergency, certain tasks should be done. These items ought to be listed explicitly in the plan. Some things that the mine operator needs to consider having on this list follow:

1. Determine if miners are trapped or missing and if communication with them is possible.
2. Ascertain the exact nature of the emergency and its location in or about the mine.
3. Notify mine rescue teams if necessary.
4. Notify emergency medical services, hospital(s), rescue squad(s), fire department(s), or other outside services if they are needed.
5. Notify federal and state regulatory agencies.
6. Initiate fire fighting or rescue and recovery operations.
7. For underground mines, determine if all mine fans are still operating.

Command center and other facilities—Work places should be available for use by a number of individuals on the surface. These include company personnel, officials from state and federal agencies, miners' representatives, and others who will be involved in directing a response to the emergency. An area needs to be set aside to serve as the command center. Space may also be required for meetings and briefings, servicing mine rescue equipment, first aid administration, a temporary morgue, and other functions.

Definition of roles and responsibilities—Each person who will be participating in handling an emergency, from rank-and-file workers to the mine manager or superintendent, needs to know exactly what his or her responsibilities are during this event. Roles should be so well defined that any qualified person can be assigned any position and know what the associated duties are. This may be accomplished by developing task cards—pocket size cards that define clearly the duties and responsibilities for each position. The cards can be distributed to responders, who will carry and refer to them at any particular moment during a situation. This will ensure that they have properly attended to all assigned duties.

Rotation of commanding personnel—Depending on the nature of a mine emergency, company officials may be required to be at the scene for several days. In one reported case, a mine superintendent worked 37 straight hours at a mine fire before leaving the command center. Research has shown that lack of adequate rest severely inhibits a person's ability to make quality decisions. Poor decisions in a mine emergency can jeopardize the lives of responders at the scene and/or severely hamper efforts to deal with the event. Company officials need to make arrangements for rotation of command personnel at the emergency site to ensure that those individuals who will be required to make critical decisions are well rested.

Activities logging—At least until additional personnel arrive at a scene, the company should assign someone on the surface to maintain a log of all rescue and recovery activities. This log ought to be detailed and include all major activities that have occurred since the onset of the emergency.

Fan Operation—When required, the mine operator should have all surface fans examined to determine their condition. The operator should assign a person to each operating surface fan to ensure its continued operation.

Property entrance restriction/security—The operator should, as part of planning, establish a policy restricting entrance to authorized personnel in the event of a mine emergency. Only those required to handle the situation should be permitted on mine property. Guards ought to be assigned at each mine entrance. Often, local law enforcement agencies will provide officers to fill this job.

Supplies and Equipment—Depending on the nature of a particular mine emergency, supplies such as crib blocks, timbers, brattice curtain, concrete blocks, water line, rock dust, and other articles may be needed in quantity very quickly. In the event of an underground mine fire or explosion, materials such as ready mix concrete, steel plates, wood, and stone or gravel may be required for sealing the mine. Liquid carbon dioxide may be needed in an attempt to smother a fire. Provision should be made with suppliers and other mining operations to provide these items on short notice when needed. Machinery such as scoop tractors, auxiliary fans, foam generators, power centers, pumps, front end loaders, bulldozers, drill rigs, and other equipment and tools may have to be brought on site quickly. Arrangements should be made in advance with company purchasing agents and suppliers of this equipment to ensure quick delivery to the mine site of these and all other necessary items.

Interacting with the media—Any major mine emergency will draw attention very quickly. In a matter of hours, media representatives will be at the scene to obtain current information about the situation. It is important to determine beforehand how the media is to be dealt with and who will interact with them to ensure dissemination of accurate information. One group of small mine

owners are looking to their operators association for support in this area. During a response, mine management keeps the operators association staff updated and tells all media representatives to go to that staff for information. The association staff then prepares press releases and handles all inquiries from the media. Whether the media is to be handled by mine personnel or by some designated representative should be decided and communicated before an event occurs.

Needs of personnel on the scene—If a number of responders are required on the scene for a long period of time, arrangements should be made to provide these individuals with sleeping quarters, food, and other essentials. Agreements can be made in advance with area motels to provide lodging. Local restaurants and grocery stores can be commissioned to provide food as needed.

Needs of relatives and friends—When an emergency occurs, relatives and friends of miners working at the operation may arrive on site seeking information about loved ones. Mine officials should prepare to deal with relatives and friends by providing them with the latest factual information available. If possible, there should be arrangements to have counselors and clergy available to interact with family members during the emergency. A suitable facility might be necessary for family members who wish to remain on site during the response.

Special needs of response personnel and others involved—In a mine emergency, workers and rescue personnel are faced with numerous situations that may result in severe emotional stress and trauma. This condition, called Critical Incident Stress, can frequently result in short or long term emotional difficulties that affect one's ability to function. There should be arrangements to have counselors, trained in Critical Incident Stress Debriefing (CISD), available for workers who witnessed or were involved in the emergency. These counselors could also assist individuals who participated in the response. CISD is a technique for helping normal people cope with stress associated with abnormal events.

Communications—Communications is one of the most crucial elements in managing a mine emergency. Quality communication links are needed between a command center and the emergency location. There must also be good links between a command center and facilities away from the mine site. An operator needs to assign a person to ensure that mine phones or other communication systems are in place and working. It is not uncommon for a mine to have only one telephone line servicing the operation. Depending on the nature of an emergency, however, additional phone lines may be needed. The capability to add additional lines during an emergency should be prearranged with the phone company.

The purpose of this portion of the paper was to stimulate thinking by illustrating some of the many items that must be dealt with during a mine emergency. The elements of a mine emergency response plan that have been mentioned are but a few of the many components that could comprise a quality effort. An important point to remember is that the time to plan for a mine emergency is before an event occurs rather than in the middle of a situation.

Developing a plan you can use

When the planning process has resulted in a final document, a Mine Emergency Response Plan, then the next phase of preparation begins. Everyone who works at the mine site ought to be trained in the plan's contents. They should also be introduced to the various roles included. Individuals must know what they are likely to be asked to do if the plan were put into use. They should also be aware of company policy on response issues such as site security and interactions with the media. If possible, miners and responders should be given an opportunity to practice carrying out the plan or, at least, some portion of it. Less direction and coordination will be needed to start up a response if more people are trained to follow the plan. During training, the plan will also be tested and can be revised and refined to match mine site demands.

Preparation for a large-scale emergency should be an on-going process. Phone lists and mine maps should be up-dated routinely. New hires should be introduced to the mine emergency response plan before they start to work. On occasion, everyone ought to be reminded of the plan and of their role(s) in it. When there are changes to a mine, mine management, or local resources, the plan should reflect those changes. The result will be a work force that is more confident of management's commitment to their safety, inspectors who see that the extra step has been taken at this site, and responders and decision-makers who are better prepared. If the worst happens, management will know all that could be done to make an emergency response as efficient and effective as possible was done.

HSA

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Safe vibration levels when blasting next to buried high pressure gas pipelines

By Jim Ludwiczak

For many years, the main interest for protecting structures from damaging blasting-related ground vibrations has been for structures such as buildings and other man-made surface structures. Even the regulatory agencies have focused on limitations for the protection of "controlled structures." Current industry and regulatory standards regulating the limitations of ground vibrations from blasting are also mainly concerned with damage control to man-made surface structures. Many of the regulations, especially for surface coal mining, are based on the Bureau of Mines Report of Investigation 8507, titled "Structural Response and Damage Produced by Ground Vibrations From Surface Mine Blasting." Essentially, the report suggests a safe level of one inch of peak particle velocity (PPV) for buildings. As the title indicates, this work was for the development of safe vibration levels for surface structures/buildings, not underground mines, buried pipelines, or other utilities.

Underground utilities, such as pipelines, are known to react differently than buildings and are able to withstand vibrations at much higher levels than those recommended for buildings. This fact caused the Federal government (and many states) not to establish a safe vibration limit for buried pipelines/utilities. The regulations only required that the operator notify the owner and conduct a preblasting survey of the line. The vibration limitation was commonly established by the owner of the line. Unfortunately, in most cases, the pipeline owners used the same vibration limitations as those established for buildings. Due to the lack of historical data on the effects of ground vibrations on buried pipelines, it was difficult, if not impossible, to convince the pipeline owner that one, or two, inches of PPV was too stringent for pipelines. These limitations caused the blaster to design very complicated and expensive blasting programs to comply with the limitations.

In recent years, the effects that blasting vibrations had on pipelines has become increasingly more important. This is due to both encroachment of surface mining and construction blasting. The construction blasting also included the construction of new pipelines next to existing lines. With the increase of new high pressure gas pipeline construction, the pipeline owners fell under the same limitations that they had established for others. They discovered that their own contractors had a very difficult and expensive time blasting next to existing lines and staying within one or two inch vibration limitations. As a result, the pipeline owners started working closer with the blasting industry to learn more about the "real" effects the blast-induced vibrations had on the pipelines. The fruit of this research has proven to be very beneficial for both industries.

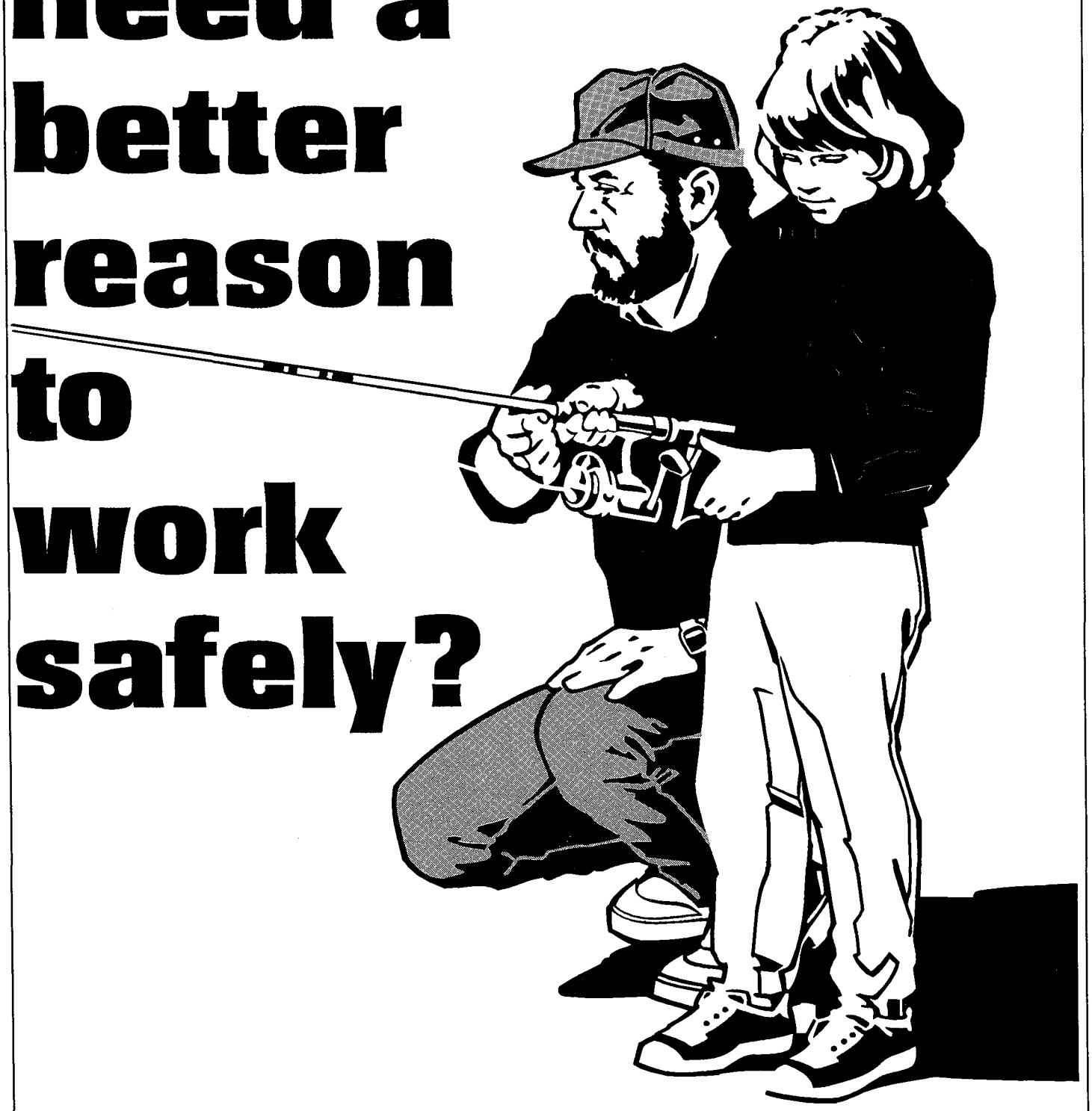
As a result of this cooperative effort between the pipeline owners and the blasting industry, many pipeline owners have increased the vibrations levels allowed at the line. Many owners have increased the vibrations levels for both large and small-scale blasting to four, and as much as six, inches of PPV. These higher levels were not only supported by data collected by the line owners, but have now been supported by recent Bureau of Mines (BOM) studies. Depending on the construction and age of the line, the BOM studies have recommended an initial safe vibration level of five inches of PPV. After additional data is analyzed, the BOM expects this level could even be higher.

After working for years with some of the major gas transmission companies in both blast designs and monitoring blast vibrations at the pipelines, I support the increase in the vibration levels . Although presently I would not recommend such levels, I have personally experienced vibration levels exceeding ten inches of PPV with no damage or adverse effects to the pipeline. After working with these people, I can also appreciate the concerns of the gas transmission industry. The danger and liability of rupturing a gas pipeline is tremendous. Their initial vibration limitations had to be very conservative for the safety of the pipeline. Blasting effects on the pipelines were just as new to them as they were to the blasting industry. It was never their intent to stop blasting next to the line. They had to make sure that the line would not be damaged. As a result, they used the only existing data available to them when developing the initial vibrations limitations. Now, with the past and present studies, they have realized that the line can withstand much higher levels of vibration than can buildings.

This does not, and should not, mean that "all" buried high pressure gas pipelines, or other utilities, can withstand the same vibration levels. The blaster must consider each line on a case-by-case basis, and work with the owners when establishing the limitations. HSA

From an article provided by Blasting & Mining Consultants, Inc., 1801 Bonnie Castle Drive, Owensboro,KY 42301; 502-683-7222 for the July 1994 issue of Acquire's ***COAL TODAY.***

Do YOU need a better reason to work safely?



Surface haulage safety: trucks, backs and belts

C.M. Keran and J.A. Aldinger, Twin Cities Research Center, U.S. Bureau of Mines

Introduction

The U.S. Bureau of Mines (USBM) is involved with reducing the accidents and injuries associated with mining. Accidents associated with mine mobile equipment are a continuing problem accounting for 12 percent (pct) of all surface mining accidents, and 39 pct of the fatalities. The largest portion (40 pct) of these accidents occur to the operator of the equipment. This article details accidents associated with the operation of mobile equipment including haulage trucks, front-end loaders, scrapers, bulldozers, and road graders for the three-year period 1989-1991, covering both coal and metal/nonmetal surface mining. The data used in these analyses were gathered from the USBM Accident Data Analysis database which includes only those accidents that are reportable to MSHA, and does not include contractor accidents.

Table 1.—Accident frequency and severity by equipment type (1989-91)

Equipment	Accidents No.	Accidents Pct	Mean LWD	Fatalities No.	Fatalities Pct	Fatalities Ratio[1]
Haulage trucks	1203	42.2	19.2	28	60	0.023
Front-end loaders	881	30.9	18.6	10	21	0.011
Bulldozers	537	18.8	19.0	5	11	0.009
Scrapers	171	6.0	12.3	2	4	0.012
Road graders	60	2.1	11.5	2	4	0.033
Total	2852	100.0	18.4	47	100	0.016

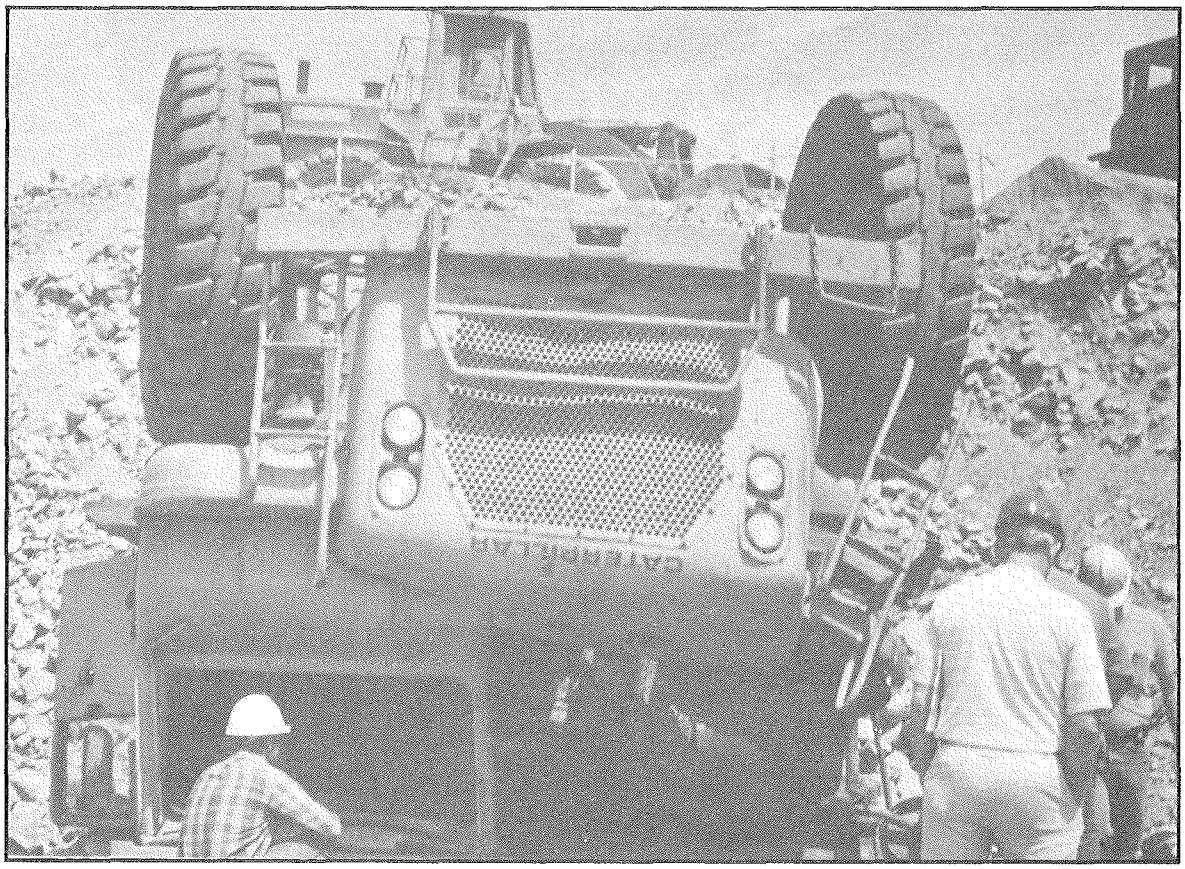
LWD = Lost work day

[1]*Number of fatalities divided by number of accidents*

Analysis of surface mine mobile equipment accidents

Type of equipment

Table 1 shows the number of accidents, mean number of lost work days and number of fatalities for each type of equipment. Haulage trucks, loaders and dozers accounted for 92 percent of the accidents and were the most severe, as measured by the mean number of lost work days. The fatality ratio for haulage trucks was second only to road graders and accounted for 60 percent of the fatalities.



A truck driver was fatally injured in 1990 when he backed his truck to the edge of the surge pile to dump his load. The pile gave way under the weight of the loaded truck and the truck went over the edge backwards. The driver was found out of the cab. He was not wearing a seat belt. According to the MSHA accident report: "Contributing to the severity of the accident was the operator not using his seat belt."

Cause of fatalities

Loss of control accidents, which include runaways,

Table 2.—Classifications of accidents related to equipment operation

Accident classification	No.	Pct	Mean LWD
Jarring	983	34.5	19.2
Loss of control	472	16.5	24.3
Passive strains	322	11.3	19.4
Collisions	234	8.2	20.0
Being struck by flying object	139	4.9	14.5
Debris in eye	130	4.6	1.2
Getting caught or smashed	108	3.8	15.7
Struck against	57	2.0	14.0
Highwall collapse or rock fall	54	1.9	20.4
Overexertion	53	1.9	21.8
Fire	51	1.8	5.2
All others	249	8.7	15.4
Grand total	**2852**	**100**	**18.4**

LWD = Lost work day.

accidents, which include runaways, being too close to the edge, etc., were responsible for 29 of the 47 fatalities. Loss of control fatalities most frequently involved haulage trucks, especially while the truck was dumping. Twelve of the 29 loss of control fatalities involved the operator either jumping or getting thrown from the vehicle. Collisions were the second most common cause of fatalities, and nine of the twelve fatal collisions involved a pedestrian getting struck by a vehicle.

Types of Injuries

The types of injuries that result from mobile equipment accidents vary, but sprains and strains were far and away the largest category of injuries (42 percent), followed by multiple injuries, bruises, lacerations, and fractures. Sprain or strain injuries averaged 19.4 lost work days while fractures were among the most severe, averaging 33.1 lost work days.

The most frequent body part injured was the back, accounting for 29.8 percent of the accidents. Back injuries tended to be more severe (22.2 lost work days) than the average injury for all accidents (18.4 days). Multiple body part injuries were the second most common and one of the most severe, averaging 28.1 lost work days. Other frequently injured body parts were the neck, eyes, fingers, head, and shoulders.

Accident classifications

The accidents were classified by the action, event, or cause which best describes the circumstances of the accident. Table 2 shows the major classifications, the percentage, and the mean number of lost work days for each type. The number one cause of accidents was jarring of the equipment operator. These accidents involved an acute trauma event which jarred or jolted the operator during otherwise normal operation (i.e., rough ground, loading shock, dumping shock). Combining jarring with rollovers, runaways, collisions, and other impact related accidents accounted for 60 percent of the accidents involving the operator.

Seat belt usage

Generally, only the most severe accidents reported whether seat belts were worn or not worn. Given this limited database, there are several points worth mentioning (see Table 3). When seat belts were worn, the lost time accidents averaged 31 lost work days and no fatalities occurred. When belts were not worn, lost time accidents averaged 41 lost work days and 8 fatalities occurred.

The difference between wearing and not wearing a seat belt is magnified for the loss of control accidents (not represented in Table). Loss of control accidents with a rollover averaged 18 lost work days when a seat belt was used, with no fatalities. When not wearing a seat belt, the lost work time jumped to 44 days and 4 fatalities occurred.

Summary and discussion

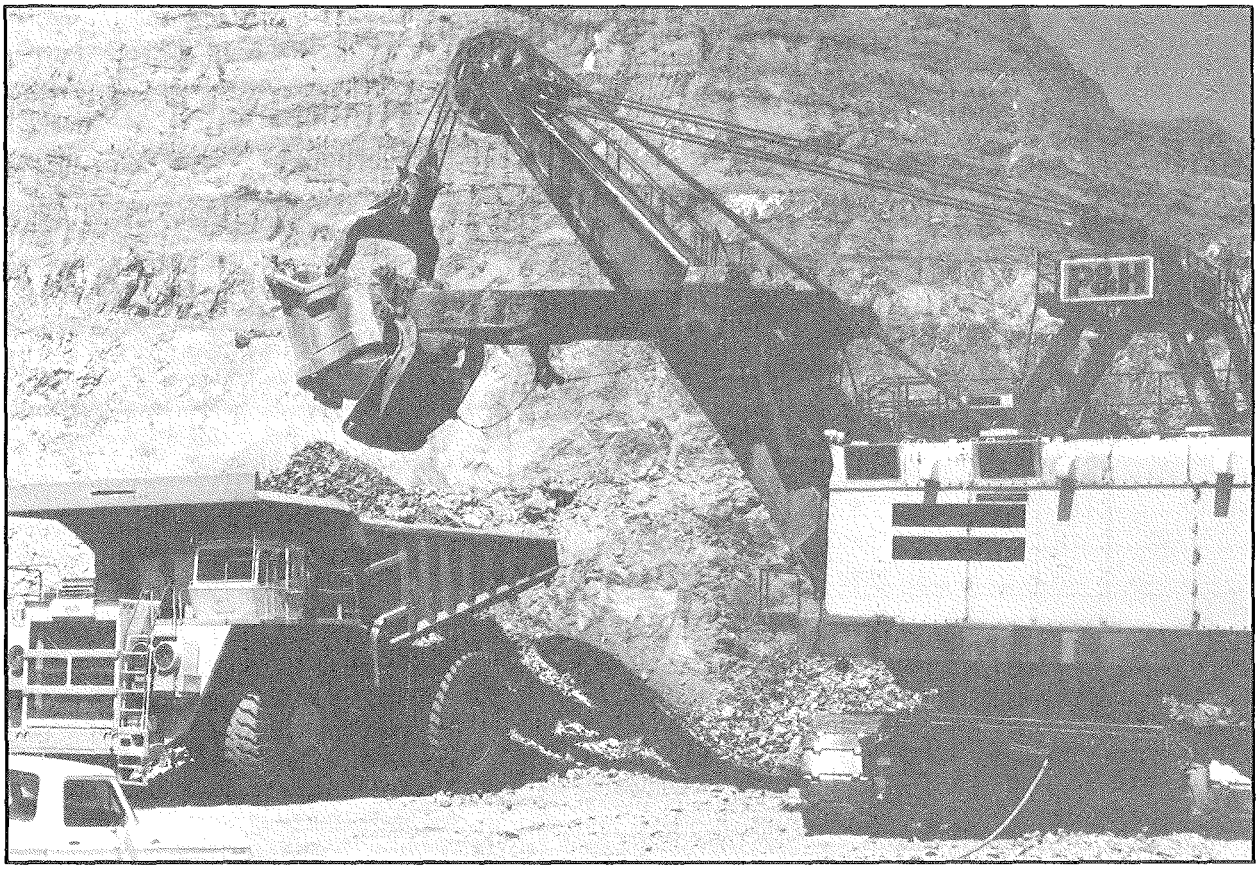
Haulage trucks were responsible for 60 percent of the fatalities involving operators of mobile mining equipment. Most of the haulage truck fatalities were from loss of control accidents, either at dump points or while tramming haulroads. Many of these accidents result in rollovers and also operators jumping or being thrown from the vehicle. These statistics point to the importance of wearing a seat belt and staying within the cab's rollover protective structure.

The other large portion of fatal accidents was pedestrians being struck by a vehicle (9 of 47 fatalities). Seven of these occurred with haulage trucks, which typically have larger blind areas than other machines. Miner training needs to emphasize the poor visibility of objects near mobile equipment, particularly haul trucks.

Table 3.—Seat belt usage and its effect on accident severity

Accidents with seat belt use determined	Seat belts: Worn No.	Worn Pct	Not worn No.	Not worn Pct
Total	89	100	74	100
Lost work day accidents	61	68	54	73
Lost work days (mean)	31	NAp	41	NAp
Accidents with no time lost	22	25	5	7
Restricted work	6	7	4	5
All others	0	0	3	4
Fatalities	0	0	8	11

NAp = Not applicable.



Injuries to haul truck drivers can occur while the truck is being loaded if the operator is not adequately protected against loading shocks. Loading shocks can occur due to the bucket striking the truck body or from large boulders being dropped into the bed.

to be the most common injury. Fitness programs supported by the mine and seats that have good shock and vibration attenuation capabilities may help prevent many of the injuries due to impacts. Upper body motion during sudden vehicle movements contributes to back and neck injuries. A person tightly coupled to the seat by a seat belt with lap and shoulder harness is more likely to escape injury in the event of an accident.

Not wearing a seat belt more than doubled the lost work days for rollover accidents compared to similar accidents with seat belts worn. Most of the operator accidents involving impacts could potentially be eliminated, or their severity reduced, by improved seats and the use of operator restraints. Perhaps the most important reason for wearing a seat belt is saving lives. Of those accidents where seat belt use or non-use could be determined, no fatalities occurred with the operator wearing a seat belt; however, eight fatalities occurred when belts were not used.

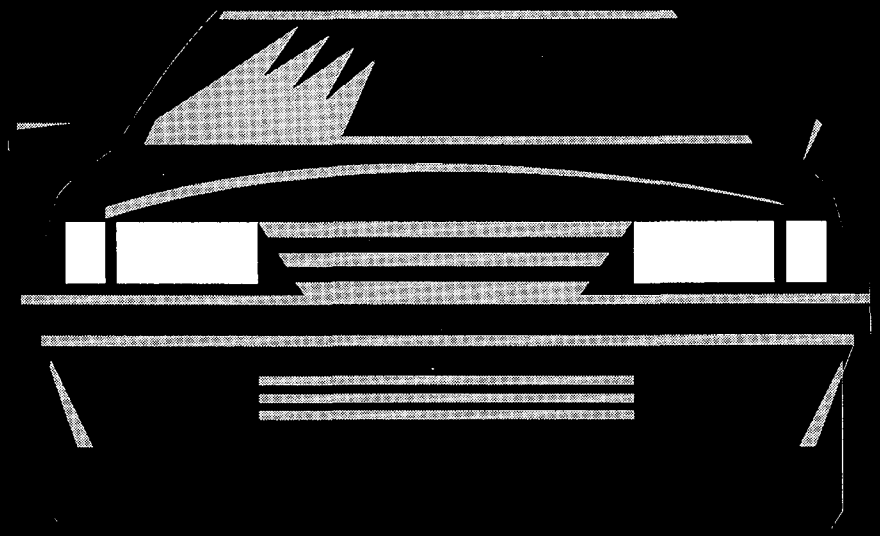
HSA

OCTOBER NOVEMBER DECEMBER JANUARY FEBRUARY MARCH

W I N T E R

ALERT reminder: *● Always maintain adequate mine ventilation and make frequent checks for methane and proper airflow. ● Know your mine's ventilation plan and escapeways. Properly maintain methane detection devices. Communicate changing mine conditions to one another during each shift and to the oncoming shift. ● Control coal dust with frequent applications of rock dust. ● Make frequent visual and sound checks of mine roof during each shift. NEVER travel under unsupported roof.* *Adapted from Va. Dept. of Mines, Minerals, & Energy*

Take precautions to deal with hazards of night driving



The Phelps Dodge Morenci, Inc., Human Resources Safety Team obtained the following information from the Arizona Chapter of the National Safety Council. We hope it will help protect you and your loved ones.

Driving at night results in three times more deaths than driving during the day. Yet many of us are not aware of night driving's special hazards or don't know effective ways to deal with them.

Driving at night is more of a challenge than many people think. It's also more dangerous.

Why is night driving so dangerous? One obvious answer is darkness. Ninety percent of a driver's reaction depends on vision, and vision is severely limited at night. Depth perception, color recognition and peripheral vision are compromised after sundown.

Older drivers have even greater difficulties seeing at night. A 50-year old driver needs twice as much light to see as well as a 36-year old.

Another factor adding danger to night driving is fatigue. Drowsiness makes driving more difficult by dulling concentration and slowing reaction time.

Alcohol is the single most significant factor in fatal traffic crashes, playing a part in more than half of all motor vehicle related deaths. That makes weekend nights more dangerous. More fatal crashes take place on Friday and Saturday nights than at any other time in the week.

Fortunately, you can take several effective measures to minimize these after-dark dangers by preparing your car and following special guidelines while you drive.

Recommended steps

■ Prepare your car for night driving. Clean headlights, taillights, signal lights, and windows once a week, more often if necessary.

■ Aim your headlights properly. Improperly aimed headlights blind other drivers and reduce your ability to see the road.

■ Don't drink and drive. Not only does alcohol severely impair your driving ability, but it also acts as a depressant. Just one drink can induce fatigue. Also, avoid smoking when you drive. Smoke's nicotine and carbon monoxide hamper night vision.

■ If there is any doubt, turn your headlights on. Lights will not help you see better in early twilight, but they'll make it easier for other drivers to see you. Being seen is as important as seeing.

■ Reduce your speed and increase your following distances. It is more difficult to judge other vehicle's speeds and distances at night.

■ Don't overdrive your headlights. You should be able to stop inside the illuminated area. If you're not, you are creating a blind crash area in front of your vehicle.

■ When following another vehicle, keep your headlights on low, avoid glare by watching the right edge of the road and use it as a steering guide.

■ Make frequent stops for light snacks and exercise. If you're too tired to drive, stop and get rest.

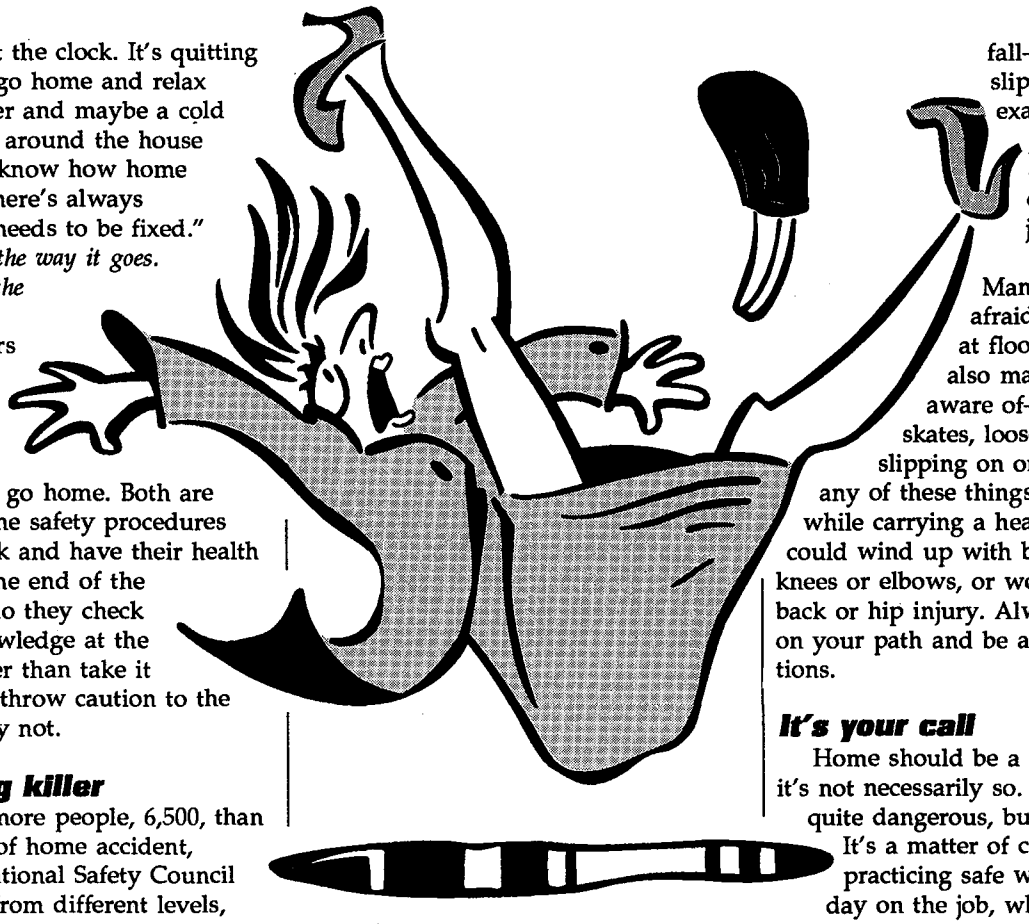
■ If you have car trouble, pull off the road as far as possible. Warn approaching traffic at once by setting up flares or reflecting triangles near your vehicle and 300 feet behind it. Turn on flashers and the dome light. Stay off the roadway and get passengers away from the area.

Observe night driving safety as soon as the sun goes down. Twilight is one of the most difficult times to drive, because your eyes are constantly changing to adapt to the growing darkness.

Please practice safe methods and procedures, both on and off the job. You and your family are important to us. HSA

Reprinted from the May 1994 issue of the Morenci Copper Review.

Safe at home



"Hey, look at the clock. It's quitting time. Guess I'll go home and relax with some dinner and maybe a cold one, then putter around the house until dark. You know how home ownership is—there's always something that needs to be fixed."

"Yeah, that's the way it goes. Well, see you in the morning."

These workers have spent another accident-free day on the job, and now it's time to go home. Both are well-versed in the safety procedures required at work and have their health to show it. At the end of the day, however, do they check their safety knowledge at the plant door rather than take it home? Do they throw caution to the wind? Hopefully not.

A surprising killer

Falls killed more people, 6,500, than any other type of home accident, according to National Safety Council statistics. Falls from different levels, such as from a roof or a ladder, are not the only concern. A same-level fall—on a wet, slippery floor for example—can be just as injurious, and in the right circumstances, just as deadly. Watch your step.

Many people are afraid of heights, but at floor level there are also many hazards to be aware of—spills, roller skates, loose rugs. By slipping on or tripping over any of these things, especially while carrying a heavy object, you could wind up with bruises, skinned knees or elbows, or worse yet a serious back or hip injury. Always keep an eye on your path and be aware of obstructions.

It's your call

Home should be a safe haven, but it's not necessarily so. Home can be quite dangerous, but it needn't be. It's a matter of choice. After practicing safe work habits all day on the job, why take unnecessary chances when you get home? HSA

Spread the news about safety

Despite the importance of safety meetings, your employees may feel they have better ways to spend their time. To help combat this lack of interest, use a variety of teaching methods and be as prepared as possible.

It's important to present your ideas with enthusiasm. Keep in mind that adults tend to be self-directed learners (they do more intentional learning outside of a classroom). As a result, they may resent being "required" to attend safety meetings. Once you acknowledge this and explain how safety procedures can mean the difference between life and death, you should have their attention.

Don't insult the intelligence of your "students" by talking down to them. They are adults, and you need to treat them as such if you want them to learn. Use real-life experiences to help workers relate to the material. Remember, the more workers are able to associate with your message, the more likely they are to pay attention and give new ideas a try. HSA

From Today's Supervisor

November 18, 1913; Acton No. 2 Mine, Acton, Ala.; 24 killed

The explosion occurred at about 3:20 p.m., with 29 men in the mine, 24 of whom lost their lives, 13 received fatal injuries, and 11 were asphyxiated. At about 6:00 p.m., 3 men escaped unassisted, and about 9:00 p.m., a man was found overcome and was taken to the surface; another man regained consciousness after being overcome and made his way to the slope where he was found by rescuers. The explosion originated from overcharged and blown-out shots of black powder in the dry and dusty workings of the 8th left entry. Inexperienced foreign workers were placed there without safe instruction. Shooting was off the solid. No water was used. HSA

From Bureau of Mines report, by E.B. Sutton.

Non-fatal accident, mobile equipment (FEL) Rock Crushers, Inc., Harmel Pit North

On July 28, 1994, Jack Mathis, a front-end loader (FEL) operator, started to work at 7:30 am, his normal starting time. He had less than 4 months of experience on the 1994 Fiat Allis 5-yard rubber tire loader. The Fiat Allis was equipped with a joy stick control in place of the conventional twin levers for tilt and hoist. Mr. Mathis' total mining experience could not be determined but at best he had very limited expierence. In fact the only known work related experience was operating a farm tractor with bucket attachment.

On the day of the accident, Mathis was assigned to strip overburden, as he had been doing for the past 2 weeks, and put the stripped overburden in a spoil pile for future use. On his second load of the morning, he was traveling up a slight grade on unlevel ground with a full bucket of material that was in a fully raised position and making a right hand turn. When he had reached the top of the ramp, the FEL started a slow roll to his right rolling 3/4 of a turn coming to rest on its left side. Mathis was wearing his seat belt and did not suffer any injury. When questioned, Mathis stated that "seatbelts do work." HSA

Robert White
Mine Inspecior
San Antonio Field Office
San Antonio, Texas

Coal industry extensively impacts U.S. economy

WASHINGTON—The indirect economic effects of coal production on the U.S. economy are more than six times the direct ones, extending to every other sector of the economy and every region of the country, according to a Pennsylvania State University study, "The Impact of Coal on the U.S. Economy."

The report says while the direct contribution of coal production to the economy has a value of $21 billion, the industry's stimulation to other business sectors across America indirectly results in a $132 billion contribution to the economy.

The U.S. coal industry directly employs 136,000 workers, but is indirectly responsible for nearly 1.5 million workers. Thus, every American coal miner results in an employment of 11 additional jobs in the larger economy, according to the study's author, Dr. Adam Rose, a Penn State professor. The analysis also shows coal's $13.8 billion in direct personal income actually results in nearly $67 billion in personal income in the overall economy.

The impacts of the U.S. coal industry on the gross output of all of the sectors of the nation's economy total $132 billion. Those other sectors most affected by coal production are (in rank order): real estate, health/education/social services, wholesale/retail trade, business services, finance, food products, finance, transportation, electric utilities, motor vehicles, maintenance/repair, oil/gas extraction, and refined petroleum products—all with gross output increases in excess of $1 billion. The total increase in employee wages and salaries is more than $24 billion.

Coal is the largest domestic source of energy produced in the U.S.; coal is the basis for 55-58% of all electricity generated in the U.S.; coal is a vital ingredient for the steel industry; coal directly serves industrial energy requirements; and U.S. coal exports, which go around the world, add some $4 billion to the U.S. balance of trade. *"Coal forms the backbone of the nation's energy supply, and energy is the backbone of our economy,"* the study concludes. HSA

Reprinted from the July 1994 issue of Acquire's ***COAL TODAY.***

Holmes Safety Association Monthly safety topic

Fatal powered haulage accident

GENERAL INFORMATION: A 35-year old truck driver was fatally injured when he was run over by a 10-wheeled Mack dump truck which was backing up. The victim had a total of 14 years experience as a truck driver, the last 5 days with a contractor trucking company. He was a customer at the operation when the fatality occurred.

The victim was employed by a contractor trucking company that purchased stone and transported it to various customer sites. The company had a fleet of trucks which hauled aggregate and asphalt (black top) to various job sites in the area.

The quarry was a stone aggregate operation. Granite was mined from an adjacent quarry. The material was crushed and screened to produce various sized aggregate. Customer trucks were loaded by a front-end loader and the product entered commerce in the road and building construction industry.

The mining company provided outside vendors and customers written notice of operational requirements and company safety rules. The victim signed the notice at about 8:00 a.m. on the day of the accident, acknowledging that he read and understood he was to stay in his truck while it was being loaded.

DESCRIPTION OF ACCIDENT: On the day of the accident, the victim reported for work at his regular starting time of 7:00 a.m. He was assigned a 10-wheeled dump truck, No. 6, and was to haul crushed stone from the quarry to customers. Reportedly, around 8:00 a.m., he arrived at the quarry to pick up his first load of crushed stone. On this trip, he was accompanied by a truck driver trainee. Upon stopping at the scale station, the victim was given the hazard warning and recognition form required by the mining company, which he signed. He then left the quarry to deliver the aggregate. The victim returned for another load of crushed stone shortly after 9:00 a.m. He backed his truck up to the 3/4-inch stone pile. After stopping the truck, he dismounted and walked to the front of the vehicle.

At that time, another truck driver, who was operating a second 10-wheeled Mack dump truck, No. 5, and the truck driver trainee, who was now traveling with him, arrived at the same stockpile. The other driver pulled to the opposite side of the haul road and parked. The other driver and the truck driver trainee dismounted and walked toward the victim who was standing at a point between the two trucks. Their conversation included a discussion of what size stone was needed and where it was to be delivered.

At about 9:20 a.m., the Caterpillar 988 front-end loader operator, arrived where the three men were standing. He asked if they wanted to be loaded with the 3/4-inch stone and they answered in the affirmative. The Caterpillar 988 front-end loader operator proceeded into the stockpile and began loading the victim's truck. At this time, the other driver and the trainee returned to their truck and the victim began walking toward his truck which was being loaded.

As the front-end loader operator backed away from the stockpile and started forward to empty the bucket load into the victim's truck, he noticed the victim on the ground in front of the other driver's truck. He immediately attempted to get the attention of the other driver and the company vice president, who was working nearby. The company vice president performed CPR. The front-end loader operator called for help and within minutes the local rescue squad responded and administered first aid. The victim was then transported by ambulance to a local hospital where he died shortly after arrival.

It was concluded that the victim had stepped directly into the blind spot of the other truck to stay clear of the operating front-end loader. While being interviewed, the other driver stated that after his initial look into both rear view mirrors he did not observe the victim. The other driver backed his truck into position next to the victim's truck without knowing that he had struck anyone.

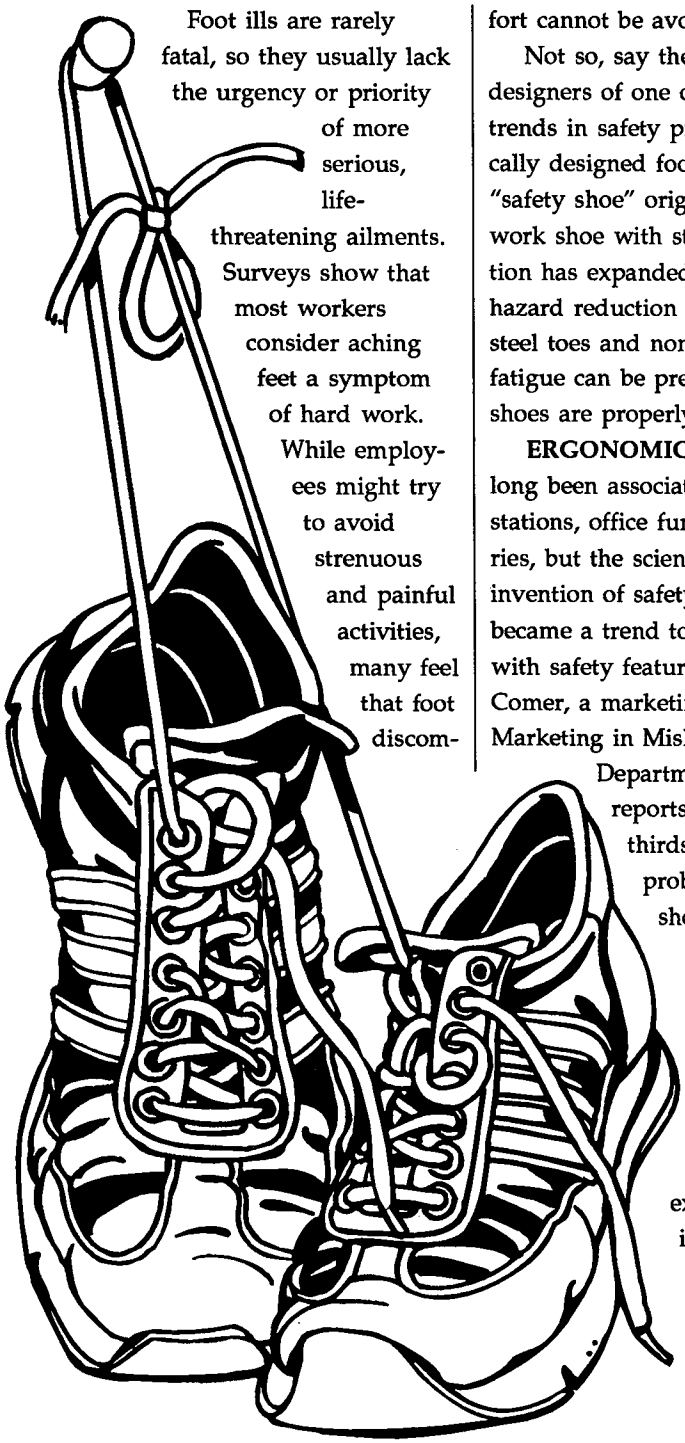
CONCLUSION: The primary cause of the accident was that the operator of truck 5 backed up his vehicle without sufficient audible warning or other effective means to alert persons of moving equipment. The surrounding noise level made the backup alarm ineffective. A contributing factor was the victim left the cab of his truck to engage in incidental discussion while in a congested loading area, after signing a statement which warned against this practice. Another contributing factor was the failure of the front-end loader operator to insist upon driver compliance with loading policies at this site.

The back-up alarm on Truck No. 5 was tested during a re-creation of the accident. The same front-end loader was assigned the task of digging into the stone stockpile while Truck No. 6 remained in place, idling. Truck No. 5 was required to back to about the same location where the victim was found. Sound level measurements taken at about ear level, with all equipment running (as it was when the accident occurred), were 87 dba. Measurements taken with all equipment shut down and the back-up alarm activated, indicated a 76 dba reading. Clearly, the back-up alarm could not be heard above the surrounding noise at the time of the accident. HSA

Footwear alleviates aches, fatigue through better fit, shock absorption

Ergonomically designed shoes assume comfort and injury prevention are compatible objectives

By Julie Johnson



Foot ills are rarely fatal, so they usually lack the urgency or priority of more serious, life-threatening ailments. Surveys show that most workers consider aching feet a symptom of hard work. While employees might try to avoid strenuous and painful activities, many feel that foot discomfort cannot be avoided.

Not so, say the manufacturers and designers of one of the developing trends in safety products: ergonomically designed footwear. The term "safety shoe" originally described a work shoe with steel toes. The definition has expanded to include electrical hazard reduction materials, improved steel toes and non-slip soles. Injury and fatigue can be prevented when the shoes are properly chosen and worn.

ERGONOMICS. Ergonomics has long been associated with work stations, office furniture and accessories, but the science was a factor in the invention of safety shoes long before it became a trend to see sport-type shoes with safety features, according to Pam Comer, a marketing expert with Juhl Marketing in Mishawaka, Ind. A 1984 Department of Labor study reports that at least two-thirds of documented foot problems were caused by shoes.

Steve Slater, an executive with an occupational footwear manufacturer, said shoe designers use ergonomics to examine how the foot is affected by walking, running and standing. According to research conducted by his company, "By-Test," the three primary causes of foot problems are:

- Constant standing or walking on hard pavement and floors.
- Shoes that do not fit, including those previously worn.
- Habitual wearing of the wrong shoes.

PHYSICAL AILMENTS. Despite the tendency to categorize physical discomfort as a normal occurrence, nonergonomic footwear can induce serious, long-lasting problems. Skeletal shock produced by everyday walking on hard surfaces is a major cause of backache among workers. Skeletal shock from repeated foot impact against hard surfaces can cause pain in the foot, ankle, knee, hip, and spine.

Other problems associated with skeletal shock due to foot impact on hard surfaces include plantar fascitis, metatarsalgia, Achilles tendonitis, and other joint ailments, according to the Department of Health and Human Services. "Those technical terms don't mean much to the average person who has been diagnosed with a joint ailment. They translate to mean one thing—intense pain," said Terry Martinez, an HHS researcher.

"It is important to remember that skeletal shock is a very volatile area. Normal activities such as walking up a flight of stairs or standing at the kitchen sink all contribute reasonable amounts of stress to the body," Martinez said. "It is the *unreasonable* shock that we're concerned about, and it must be combated with proper matting, foot support, and periodic rests." Concrete or hard floors also contribute.

The insoles serve as the foot's shock absorber, says Comer. An ergonomically designed shoe helps dampen harmful shock waves by incorporating an energy absorbing heel pad within the insole. The heel pad resists permanent compression when the heel lifts and rebounds to release stored energy before it can travel through the body as a shock wave. This design provides support and cushioning, evenly distributes body weight, reduces foot discomfort and minimizes fatigue.

The effect is cyclical. The reduction of harmful shock waves through the heel pad means that the foot can remain stable while serving as a foundation for the rest of the body.

HARMFUL HABITS. The key, then, is selecting the proper shoe that can combine comfort with shock absorption. "Old habits die hard, so to speak, and although various agencies are attempting to regulate occupational conditions and requirements, the tendency for companies and individuals is to 'Do what we've always done.' That is, in most cases, the wrong answer," Martinez said.

In 1979, a Bureau of Labor Statistics survey reported that, of those workers not wearing safety shoes, 51 percent said their employer did not require the shoes. Other reasons for not wearing safety shoes included: Did not feel they were needed (33 percent); not normally worn or impractical (30 percent); not available through employer (26 percent); and uncomfortable (16 percent).

SHOE SELECTION. Choosing the proper ergonomic shoe is as important as selecting other safety equipment, said a spokesperson for the Industrial Safety Equipment Association in Arlington, Va. "The same careful consideration should be applied to safety shoes as choosing a respirator, for example."

Risk factors for each particular worker or job must be evaluated for severity by worksite surveillance and analysis. Mark Johnson, a group leader in Corporate Ergonomics for Eastman Kodak Company, Rochester, N.Y., suggests that safety directors consider the physical, mental and environmental demands of each case.

Other selection factors which can be industry-specific include degree of repetitiveness and force of required motion, constrained postures, vibration, lack of control over job pace, duration of the work, extent of recovery opportunities, and, most important, the frequency and extent of rest breaks, Slater said.

With the current influx of manufacturers incorporating ergonomics into their shoe design and production, the final decision can be difficult. Different companies provide specific features such as waterproof protection or vulcanized rubber construction. However, some basic features serve as a benchmark:

This checklist, according to Comer, can help the feet function safely and comfortably.

- Test new shoes for their fit, and always measure both feet. Feet can widen and enlarge over time.
- The shoe is built around a "last," or a font-shaped form. A proper last places the ball joint in a position that gives space between the longest toe and the end of the shoe.
- Ensure there is space between the toes and the end of the shoe and that there is room to wiggle the toes.
- Proper length is important, since shoes that are too short block air flow and can cramp and twist the toes.
- Choose leather shoes when available. Leather allows the shoes to breathe, so the feet stay dry and comfortable.
- Test shoe flexibility by holding it and applying slight pressure with the hands.
- Choose shoes that have cushioning built in and do not add separate cushions.

Foot safety today implies more than the steel-toe protection of past generations. Comfort and injury prevention are critical elements in ergonomic footwear. Workplace footwear now have the capability to protect workers from occupational injury with something that would be worn in any situation. HSA

*Reprinted from the March 1994 issue of **Occupational Safety & Health** magazine.*

January 20, 1912; Kemmerer No. 4 Mine, Kemmerer, Wyo.; 6 killed

At about 4 p.m., a coal-dust explosion caused by a blown-out shot of black powder resulted in the death of 6 men and injury to 20 others. The mine foreman on the surface heard a rumble and saw smoke issuing from the mouth of the slope. He ordered the fan speed increased and notified the company office and the Bureau of Mines car No. 4. He went into the mine and was overcome but revived and crawled up the slope. The rescue car arrived at 4:45 p.m. and rescue crews with breathing apparatus recovered the bodies and the injured in a short while. The explosion had little force and did not damage the mine. All coal was shot off the solid. Haulageways were watered once a week. HSA

From Bureau of Mines report, by J. C. Roberts.

Reducing stress in the workplace

The work ethic is the foundation for Western society. This has resulted in the development of a serious and yet insensitive attitude toward work. We usually work long hours, silently enduring uncomfortable working conditions. The average work day, that we are paid for, is eight hours long. That does not include the overtime, time spent getting ready for or traveling to and from the worksite. The sum total of work-related hours is far greater than the paid hours. It has been documented that work and related events account for the major part of our waking hours, five or six days a week.

Fortunately, our beliefs about work are beginning to change, gradually. We are no longer focused exclusively on pay and working conditions, but now consider the quality of the work and the personal fulfillment offered by the job. Working provides us with a sense of belonging and purpose. Since we live in a society that is built on commerce and industry, the work we do defines our role in the community and strengthens our sense of identity and influences the way we confront responsibility.

Sometimes we are inclined to see a promotion as a representation of success, rather than as a means of gratification, and associate our self-esteem with our earning power. On most individual's list of priorities associated with work, happiness with their job ranks near the middle to bottom, leading to a rise in the stress related to that job. Recently, job-related stress is increasingly recognized as a leading cause of illness and mental disorders. On the other hand, too little work, boredom and dissatisfaction resulting from unemployment can also cause stress. Strengthening your self-discipline helps to avoid drifting into an abyss and loss of identity.

Therefore, recognition of our strengths is essential to job satisfaction. Each individual determines the importance of other components for their personal satisfaction. Some people view the most important element as security, others see it as the freedom to target selections. The happier you are with your job situation, the less likely you are to suffer from stress. As already mentioned, many different things influence job satisfaction. Some of these influences are beyond your control. However, a change in attitude can often produce surprising benefits. Enhancing your self-motivation should result in the recognition of your worth and pride in your abilities. Setting short and long-term goals also increase your level of satisfaction. This will add zest and meaning to your work especially if you are offered only limited feedback from your co-workers or supervisor. Lastly, try not to get trapped in a "rut." A short break periodically will enhance your work. Accordingly, you should stand back and take an objective look at what you are doing from time to time to gain a sense of gratification and enjoyment from a job well-done. HSA

Reprinted from the March 1994 issue of The EAP Advisor.

Take this stress test

❑ If you feel you have a supportive family, **give yourself 10 points.**

❑ If you have a hobby you enjoy, **give yourself 10 points.**

❑ If you belong to a social activity group (other than your family) that meets at least once a month, **give yourself 10 points.**

❑ If you are within five pounds of your ideal weight, **give yourself 15 points.**

❑ If you practice some form of "deep relaxation" at least three times a week, **give yourself 15 points.**

❑ For *each* day during the course of an average week that you get at least 30 minutes of brisk exercise, **give yourself 5 points.**

❑ For *each* nutritionally balanced, wholesome meal that you eat during an average day, **give yourself 5 points** (maximum: 15 points).

❑ If, during the course of an average week, you plan and do something you really enjoy (that's *just for you*), **give yourself 5 points.**

❑ If there's somewhere in your home you can go to for relaxation and to be by yourself, **give yourself 10 points.**

❑ If you practice "time-management" skills in your daily life, **give yourself 10 points.**

❑ **Subtract 5 points** *for each* pack of cigarettes you smoke in an average day.

❑ **Subtract 10 points** for *each* time during the day of an average week that you use alcohol or other drugs to help you relax.

❑ **Subtract 5 points** for each evening during an average week that you use alcohol or other drugs to relax.

❑ **Subtract 5 points** for each evening during an average week that you bring office-work home.

What's your score?

A "perfect" score is about 120 points. Short of that, the higher your score, the greater the likelihood that you cope well with the ups and downs of life (an "average" score is about 50 or 60). HSA

Source: Adapted from a test developed for the U.S. Department of Health and Human Services by University of Maryland psychologist George S. Everly Jr.

Seasonal affective disorder (SAD)

■ **People who suffer from SAD typically experience depression** in the fall and winter months that disappears in the spring.

Other SAD symptoms can include: mild anxiety, fatigue, loss of interest in sex, increased appetite (especially for carbohydrates), a desire to get more sleep, and a profound lack of interest in socializing.

■ **Five to six times more women than men suffer from SAD.** Typically, the disorder surfaces after age 30.

■ **The majority of people with SAD** have at least one near relative who has a psychiatric condition—usually a major mood disorder or alcohol abuse.

■ **Two hours or more of photo-therapy (light treatment)** a day can help 85% of SAD sufferers.

Most SAD studies have used *full-spectrum* light for treatment, but there is evidence that this may not be necessary to have an antidepressant effect.

■ **Treatment consists of sitting near a special light box** (five to ten times brighter than ordinary room lighting), and staring at it for a few seconds every minute.

Depression is usually improved after several days of treatment, and returns if light therapy is discontinued.

■ **The experts really don't understand** why or how SAD light treatment works to help relieve depression.

The best guess is that light entering the eye corrects a brain chemistry and physiological imbalance in the patient. HSA

Reprinted from the February 1994 issue of Arch of West Virginia Health Letter.

AS WINTER APPROACHES... *things to know about frostbite*

■ When your torso is kept warm, **the blood flow to your fingers and toes will be better—so wear layers of warm clothing.**

Layers can be removed, one by one, if and when you get overheated during exercise.

■ Use mittens instead of gloves **it's very cold. Make sure your hat covers your ears.**

■ Wear windproof outer garments and a face mask if it is windy.

■ Cold skin appears red, **and then becomes painful.**

As frostbite develops, the skin becomes white or grayish yellow, and then becomes numb. Frostbite is *painless.*

■ Common places for frostbite: **ears and ear lobes, nose, cheeks, fingers, and toes.**

■ Contributors to frostbite: **extreme cold; wind; wet clothes; and poor blood circulation due to tight clothing or boots, cramped position, certain medications, cigarettes, alcohol, and cardiovascular disease or diabetes.**

■ Often the victim isn't aware of frostbite **until someone else notices the poor skin coloration.**

What to do...

■ Do *not* rub or massage the frostbitten part **with snow, or with anything else.**

■ Take the victim inside as soon as possible. **Remove constricting clothing.**

■ To warm mildly frostbitten hands and feet, **place them in 100° to 105° F warm (*not* hot) water.**

To warm ears or face, **wrap in a moist, warm (not hot) towel.**

Burning pain, swelling, and color changes may occur before the skin turns soft and sensation returns. Do *not* thaw out a frostbitten part if you cannot keep it thawed.

■ Do *not* use heat lamps, hot water bottles, heating pads, hair dryers, etc. **Do *not* put victim near a hot stove or radiator.**

Reason: The numb frostbitten parts may be burned *before* feeling returns.

■ If blisters form, **do NOT break them.**

■ Do *not* allow the victim to use alcohol or cigarettes **(they restrict blood flow).**

■ If the skin is black in color, blistered, or hard and frozen, get emergency help immediately.

Do not attempt to rewarm victim with above problems without medical advice. HSA

Sources: The American Red Cross First Aid & Safety Handbook, The American Medical Association Handbook of First Aid
Reprinted from the February 1994 issue of Arch of West Virginia Health Letter.

You're working too hard if...

- You rush home from your 9-to-5 job just in time to catch the 11 o'clock news.
- You wake up at 6 a.m. and get dressed for work before you realize it's your day off.
- You answer your home phone, "Acme Widget Company."
- You eat breakfast, lunch, and dinner at work.
- You buy new underwear because you haven't had a chance to do your laundry.
- You type your grocery shopping list.
- Your dog doesn't recognize you.
- You're on a first-name basis with all the night watchmen.
- More of your personal belongings are at work than at home—dishes, plants, photos, shoes... HSA

Reprinted from the October 1993 issue of Arch of West Virginia employee Health Letter.

From our readers...

This is a new feature we plan to run, as material becomes available, related to small mining operations who have had success stories they would like to share with other people. Our goal is to promote health and safety throughout the mining industry. If you want to share your story with us for publication in the Holmes Safety Association Bulletin, please send the information and any photos (they will be returned) to:

Holmes Safety Association
Att: Bob Glatter, Secretary-Treasurer
P.O. Box 4187
Falls Church, VA 22044-0187

or

Fred Bigio, Editor
Holmes Safety Association Bulletin
U.S. Dept. of Labor, MSHA, EPD
4015 Wilson Blvd., #535A
Arlington, VA 22203-1984

This is a story about three small mines located in Maine, which receive training under the Maine State Grants Program. These three companies not only fall under the Mine Safety and Health Administration (MSHA) requirements, but also the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA).

The first company, in creating a safe workplace environment, asks the trainer to meet with the safety director of the mine to assess issues related to the mining company and to look at MSHA, OSHA, and EPA issues before training their employees. In setting up their training plan, we include all items related to safety and health issues. If the other agencies wish to participate in the training, we offer them the opportunity.

We have provided training for this company for the past ten years. We have established a continuing program by working with the different forces to assist the company's success. During the last ten years, the company has expanded and its safety and health record are excellent by industry standards. The safety director informed me that we made them aware of what was involved in safety and health and that we started them on their programs.

Company number two is a business that has three generations of owners from the same family. We have also done annual refresher training at this company for the past ten years. The company spreads the training throughout the year. The training begins at 6 a.m. and one key issue is addressed at each of the training sessions. This issue is followed closely for a month to see if the behavior is consistent with the training. It is then reviewed at the next training session before the next issue is scheduled. The employees suggest the issues; this is the involvement part of the sessions.

Does this work? At the last session (July 1994), the safety director informed me that the insurance carrier returned $90,000 because of their safety programs.

The third company has only eleven employees. They are very committed to safety. The president of the company issued a letter to all employees stressing their commitment to the principle to providing a safe workplace and devotes the resources necessary to see that all injuries are prevented. Because of their training program, the insurance carrier is reducing [the cost of] this company's policy between 2% and 21% as of October 1, 1994.

If we ask objective sources if there has been a change over the past ten years, the answer is look for yourself: more hard hats are worn, safety glasses are apparent, hearing protection is being worn, seat belts are used, and back up alarms are heard. This is visual evidence of success. HSA

Thomas Joyce, Maine Department of Labor

May 17, 1913; Noble Mine, Belle Valley, Ohio; 15 killed

A night crew of 20 men was engaged in the construction of a new motor road with the superintendent in charge. A few minutes before 7 o'clock, the explosion occurred at a sidetrack about 5,800 feet from the shaft bottom, where 14 of the men were working. All were killed instantly. Six other men escaped, 2 badly burned. When some of these men brought word of the explosion to the outside, miners responded at once and a party was lowered, traveling the intake airway to where 1 of the 6 survivors lay injured. He was rescued, but one of the rescuers who made several trips alone into the unventilated explosion area collapsed and died on the way out. Open lights were used, the only safety lamps being a Davy and a Clanny lamp belonging to the foreman and the fireboss. Six Wolfe lamps were procured and used in subsequent rescue work, and more rescue equipment arrived later, including Draeger helmets that were not used. In building the new door on the motor road, between 7th and 8th East entries, the opening was open for 2 hours allowing an accumulation of gas in this section. When the new door was closed, the gas was moved out upon the naked lights of the workmen. The explosion was limited and did not propagate along the haulageway. HSA

From Bureau of Mines report, by H. D. Mason and G.W. Salisbury

THE LAST WORD...

Wit is the salt of conversation, not the food.— *William Hazlitt*

If it were not for the company of fools, a witty man would often be greatly at a loss.— *François de La Rochefoucould*

He who has provoked the shaft of wit, cannot complain that he smarts from it.— *Samuel Johnson*

To be witty is not enough. One must possess sufficient wit to avoid having too much of it.— *André Maurois*

The next best thing to being witty one's self, is to be able to quote another's wit.— *Christian Nestell Bovee*

Wit ought to be a glorious treat like caviar; never spread it about like marmalade.— *Noel Coward*

Less judgment than wit, is more sail than ballast.— *William Penn*

Wit makes its own welcome, and levels all distinctions. No dignity, no learning, no force of character, can make any stand against good wit.— *Ralph Waldo Emerson*

Everything is funny as long as it is happening to somebody else.— *Will Rogers*

The satirist shoots to kill while the humorist brings his prey back alive and eventually releases him again for another chance.— *Peter De Vries*

Humor is merely tragedy standing on its head with its pants torn.— *Irvin S. Cobb*

Good humor is one of the best articles of dress one can wear in society.— *William Makepeace Thackeray*

NOTICE: We welcome any materials that you submit to the Holmes Safety Association 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 1994 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

Phone: (703) 235-1400