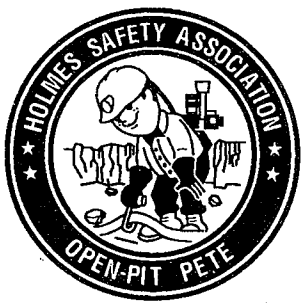
BULLETIN

July 1993



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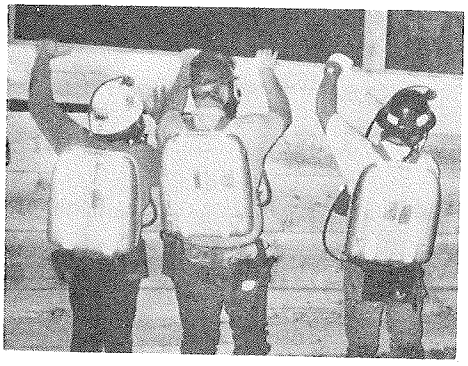

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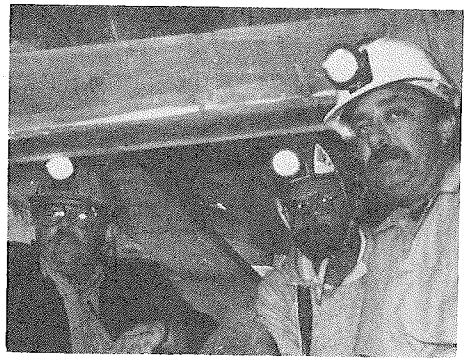

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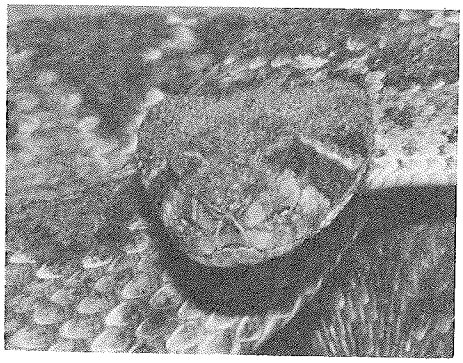

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Please note: The views and conclusions expressed in HSA Bulletin articles are those of the authors and should not be interpreted as representing official policy of the Mine Safety and Health Administration.

KEEP US IN CIRCULATION

The Holmes Safety Association Bulletin contains safety articles on a variety of subjects: fatal accident abstracts, studies, posters and other 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.

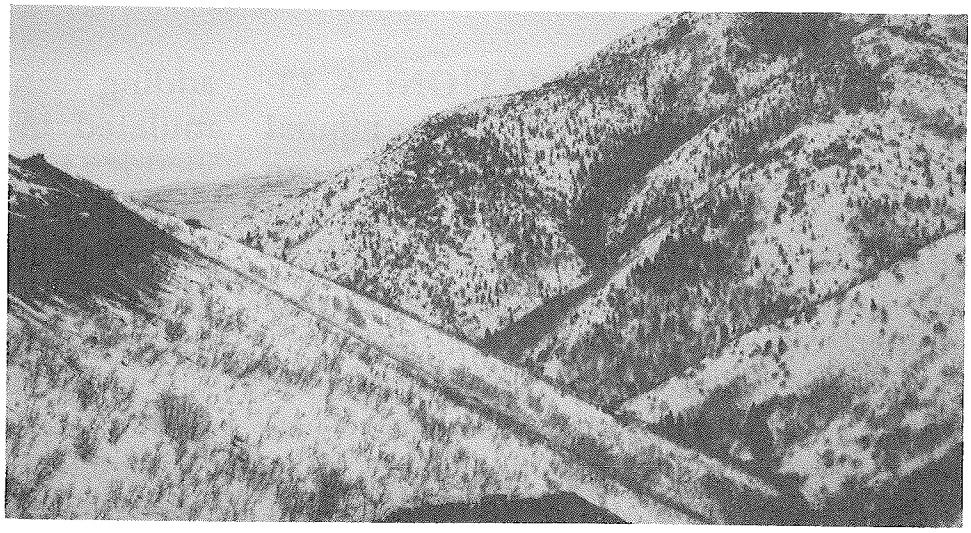
Welcome new members

NAME	CHAPTER NO.	LOCATION
Wildish Land Company	10369	Eugene, Or
H&H #2 Mine	10370	Tunnelton, WV
Hawaiian Cement—Cement Division	10371	Kapolei, HI
Resource Recovery, Ltd.	10372	Ewa Beach, HI
RMC Lonestar	10373	Lemoncove, CA
RMC Lonestar	10374	Fresno, CA
Ventura County Rock, Inc.	10375	Santa Paula, CA
Acme Paving Co., Inc.	10376	Hanford, CA
Jenkins Pit	10377	Milton, VT
A-1 Grit Co.–Redlands Plant	10378	Redlands, CA
Ray Weston Excavating	10379	Essex Junction, VT
Pine Tree Gravel	10380	Bristol, VT
L.A. Demers–Middlebury	10381	Essex Junction, VT
Milton Sand	10382	Milton, VT
Eureka Sand and Gravel	10383	Eureka, CA
Eureka Sand and Gravel–Alton Pit	10384	Eureka, CA
[Ontario] Sand Pit	10385	Ontario, CA
CZS Corporation	10386	Simi Valley, CA
Sand Canyon Rock Plant	10387	California City, CA
Arrow Rock Materials, Inc.	10388	Azusa, CA
Hi-Grade Materials	10389	Littlerock, CA
San Gabriel Rock	10390	Glendora, CA
Gene's Training	10391	Arlington, TX
Brown Equipment and Machine Co.	10392	Starr City, WV
Raven Mining	10393	Pikeville, KY
B and C Repair Company	10394	Belva, WV
Morris Sand and Gravel Plant 1	10395	Spring, TX
Morris Sand and Gravel Plant 2	10396	Spring, TX
Trial Sand Corporation	10397	Cypress, TX
Emerald Creek Garnet	10398	Fernwood, ID
Graham Aggregate Products	10399	Watertown, NY
Baker Electric	10400	Gloversville, NY
Goodfellow Bros., Inc., Poipu Branch	10401	Koloa, HI
Costain Coal Company	10402	Pikeville, KY
Big Buck Asphalt, Inc.	10403	Laredo, TX
Asbury Graphite	10404	Kittanning, PA
Heldeberg Mill Rats	10405	Sidney, NY
Heldeberg Quarry Dogs	10406	Sidney, NY
Wm. Benjamin Trucking, Inc.	10407	Mantua, OH
Town of Middletown	10408	Margaretville, NY
Francis Sturtevant	10409	New Haven, VT
Davis H. Gilmore	10410	Middlebury, VT
El Rancho Rock and Sand	10411	Stockton, CA
Brown Sand, Inc., #4	10412	Manteca, CA
Western Slate, Inc.	10413	Poultney, VT
Waste, Inc.	10414	Concord, NH
Grines, Inc.	10415	Morrisville, VT
Saline Crushing and Excavating	10416	Benton, AR
Bihlman Butte Rock	10417	Live Oak, CA
Rhone-Poulenc	10418	Montpelier, ID

Buckle-Up Program

Nomination for recognition

Michael Jeffries, age 26 years, is a Caterpillar 631-E scraper operator for Ames Construction, Inc. of Copper, Utah. Work at the site consisted of removing overburden and construction of roads for expansion of the pit.



Jeffries operated one of the scrapers parked on the ramp waiting for the push cat to get into position. As his tractor made the turn he noted that the trailer started to slide sideways so he gave it some throttle to pull it out of the slide. When it did not straighten out, he lowered the pan to the ground in an effort to stabilize the vehicle as the scraper began to roll over.

Jeffries received only a laceration to his head and contusions as his scraper traveled down hill approximately 750-800 feet and made nine 360-degree rolls in that distance. The hill was covered with 3-4 feet of snow, and the scraper in its downhill plunge, uprooted and broke several trees, some of which were 10 inches in diameter.

Jeffries stated that he only remembers the first roll and then climbing out of the cab at the bottom of the ravine. Jeffries stated that he always wears his seat belt while operating equipment. The scraper was equipped with roll-over-protection and seat belts which he attributes to saving his life.

Training provided by this company and their safety policies and procedures prevented this accident from becoming a major incident which could have resulted in a fatality.

Submitted by: William Tanner, Jr. Supervisory Inspector, MSHA

Holmes Safety Association Monthly safety topic

Fatal electrical accident

GENERAL INFORMATION: A 43-year-old truck driver was fatally injured when he raised the bed of his truck into an overhead power line. The victim had a total of 20 years experience as a truck driver, the last 4 months hauling for a customer from this operation.

The operation was a surface aggregate and lime producing facility. The plant was normally operated three 8-hour shifts a day, 7 days a week. A total of 86 persons was employed.

The victim was employed by an independent trucker to haul calcium chips from this operation to their facility in a nearby state.

The limestone deposit was mined by drilling and blasting multiple benches. Broken stone was loaded by front-end loader into haulage trucks which transported the material to a crushing and screening plant outside the quarry. Aggregates were stockpiled and lime products were stored in silos and bins.

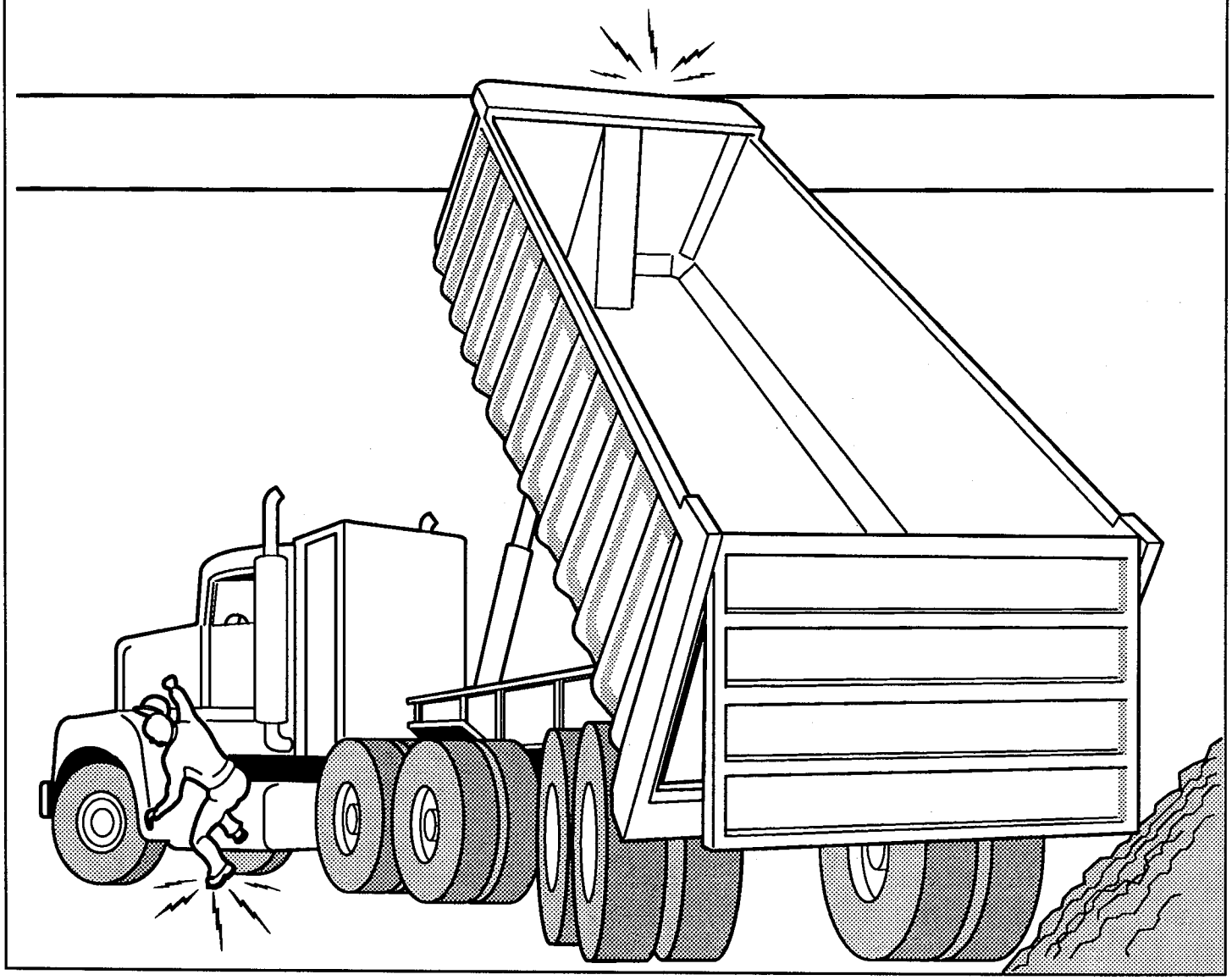
DESCRIPTION OF ACCIDENT: On the day of the accident, the victim arrived at the mine at about 9:45 a.m. The weather was cold and windy and visibility was poor. It had snowed the night before and was snowing on the day of the accident. The front-end loader operator saw the victim at the water spray station (located on a spur-type access road to the lime plant) adding water to the snow that had accumulated in the bed of the trailer. The victim's truck had been parked overnight and snow had accumulated in the bed. Since the product had to be delivered clean and dry, he drove under the water spray to liquefy the snow so it could be dumped. The victim then drove the truck about 250 feet toward the plant and pulled over to the side of the road. He raised the trailer to dump the snow and the front of the bed contacted the overhead power line. The power line ran parallel and adjacent to the road and was 28 feet above the ground at this location. The overhead power line involved supplied power to the plant at 7,200 volts.

The lab technician was driving toward the plant and saw the truck on fire. He quickly returned to the office to get help and a fire extinguisher. He and the plant superintendent returned to the scene but could not get close to the truck because of dense smoke. The victim was lying on the ground beside the cab. When the plant superintendent attempted to use a fire extinguisher from about 10 feet away, he received an electrical shock. At this time they noticed that the bed of the truck was in contact with the overhead power line.

The local fire department and rescue squad were summoned and the victim was pulled away from the truck with an insulated pole. He was transported to a local

Metal and Nonmetal mine fatalities to date—thru 06-17-93

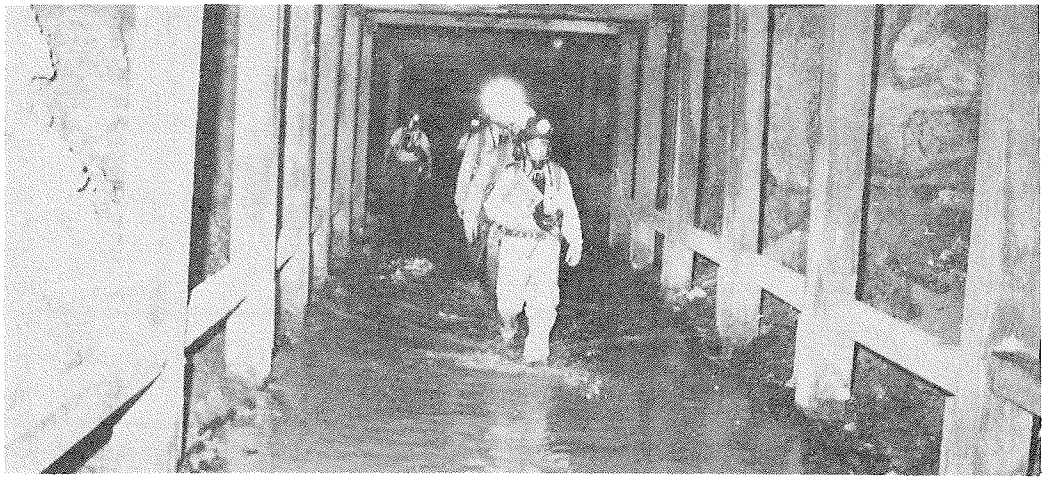
Type	1989		1990		1991		1992		1993	
	UG	S	UG	S	UG	S	UG	S	UG	S
Fall of roof/back	2	0	1	0	2	0	2	0	2	0
Haulage	1	2	1	8	0	4	1	7	1	4
Machinery	0	4	0	5	0	1	0	5	1	3
Electrical	1	1	0	0	0	4	0	1	0	1
Other	2	11	2	6	3	7	0	2	3	3
Total	6	18	4	19	5	16	3	15	6	12



hospital where he was pronounced dead. Utility company personnel arrived about 1-1/2 hours later to shut off the power.

CONCLUSION: The accident was caused by the proximity of the overhead power line to the water spray station and access road. The water spray was provided primarily to wet loaded trucks as a dust control measure when they left the plant. A similar nonfatal accident occurred at this same location five years before, which should have provided adequate notice of an existing hazard.

They hope mine rescue training will never be needed

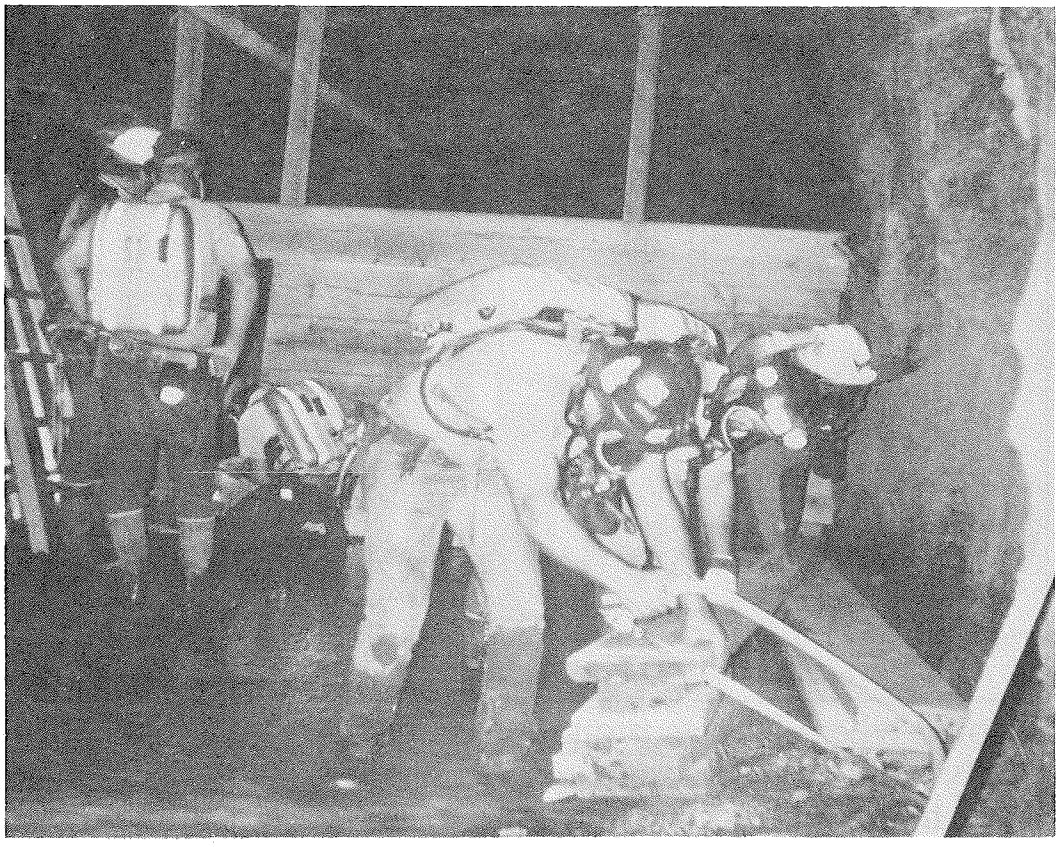


Having finished their training exercise the two teams walked down the tunnel to the adit and got ready to compare notes during the debriefing. First they had lunch and cleaned the breathing apparatus.

Ten underground miners trained recently for an event they hope never will happen—a mine emergency, probably a cave-in or a fire.

The two five-man rescue teams gathered in Jerome, Arizona, from three small underground mining operations in central Arizona for the regularly scheduled training exercise; they and other miners who volunteer for the special teams meet six times a year to test their equipment and themselves in simulated mine disasters. Each volunteer must have at least a year of underground mining experience and pass a physical; he/she then receives 20 hours of initial training and 40 hours a year of training thereafter.

This time the two teams were fighting a simulated fire in the old United Verde Extension (UVX) mine in Jerome. While five of the men walked more than a mile into the ore haulage tunnel to the station intersecting the shaft for a



One man saws a 2 x 12 for the bulkhead while the others measure for the next one. It took the team an hour and 15 minutes to complete the bulkhead, which would restrict air flow and smother a fire in a real emergency. The men worked in six inches of water, which was flowing out of the mine.

mapping and ventilation exercise, the other five men constructed a bulkhead 1,000 feet in from the portal to restrict air flow; one of the basic ways to extinguish a fire is to starve its oxygen supply.

David Hamm (left, without the self-contained breathing apparatus), Arizona State Deputy Mine Inspector, monitors progress on construction of the bulkhead during the mine rescue training exercise. The other team of underground miners was about a mile up the tunnel on a mapping ventilation exercise.

A fire in an underground mine is hard to fight; the miners can't just call the local fire department to come put it out. It takes highly trained, physically strong people skilled in underground mining techniques to do the job.

Up to 40 years ago, there were many more underground mines—and miners—in Arizona and almost all of the mines had their own teams trained to rescue trapped miners and extinguish fires. The larger companies had fully staffed and well-equipped mine rescue stations. Teams from different mining companies would stage regular competitions and members of winning teams were highly valued employees.

Also, the companies had agreements to help each other in case of emergency; if a cave-in or fire occurred at a mine, teams from other companies would rush to the site to help with the rescue. Mine rescue contests still are held and teams from different states compete in the various skills required.

There aren't nearly as many underground mines or miners now, but the risks still exist, so rescue capabilities still have to be maintained. Since 1977 the federal government has required that rescue capability be maintained within two hours ground travel time of any underground mine, and for many years the Arizona State Mine Inspector's office has coordinated the training and deployment of the rescue teams.

Douglas K Martin, Arizona State Mine Inspector, stated that he is proud of the work his office has done in maintaining the underground mine rescue capability around the state.

"Our staff is highly skilled," Martin stated. "My deputy inspectors had many years experience in underground mining prior to entering state service. They have been able to do an outstanding job coordinating this invaluable service for the underground mine operators around the state. Unfortunately, we may not be able to continue it much longer."

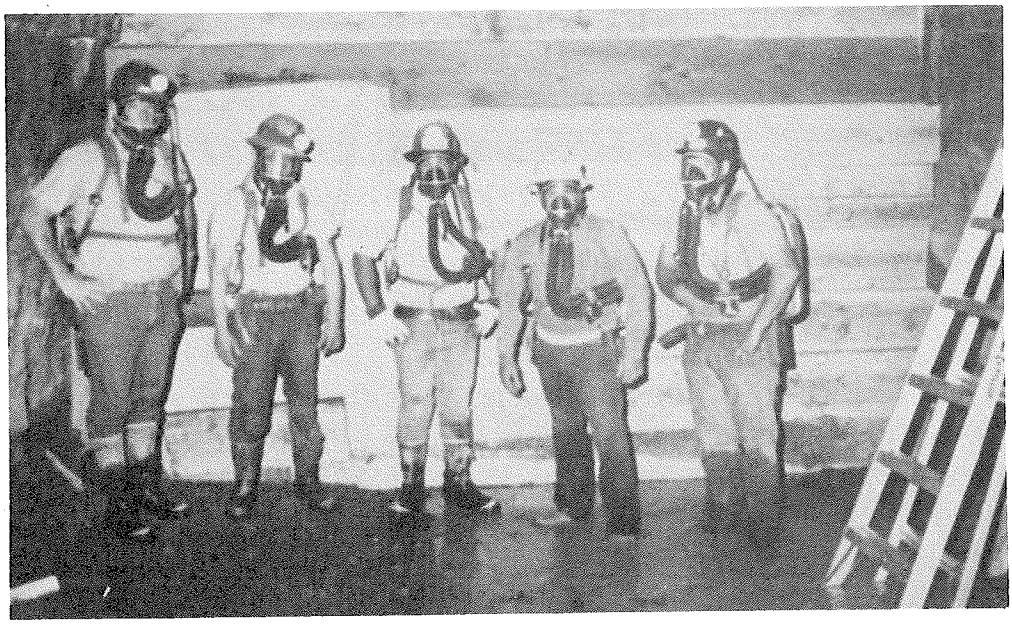
Martin explained that his office cannot afford, among other things, to continue maintaining the expensive equipment necessary for the mine rescue teams. For instance, the self-contained breathing apparatus the rescue miners must wear to enter a mine with a bad atmosphere costs $3,000 each. These units are stored strategically around the state at centrally located underground mines; they are used, cleaned and maintained during the regularly scheduled mine rescue exercises. Replacement parts for these units are expensive; each unit costs approximately $1,200 a year to maintain.

For that reason the State Mine Inspector's office has been instrumental in seeking to form the Arizona Mine Emergency Association, Inc. This is a group that would be made up of participating underground mine operators; other states already have formed such associations. The equipment now maintained by the Arizona State Mine Inspector's office would be turned over to the association.

Units used in the most recent training exercise in Jerome March 15 are Drager BG 174A oxygen breathing apparatus. Each weighs 48 pounds and will supply a rescue miner with up to four hours of air while he/she works in a confined and dangerous environment.

During that training exercise the two five-man teams entered the UVX haulage tunnel at 10 a.m.; they were to meet at the bulkhead at 11:30 a.m. In between, members of the first team had to make their way to the station over a mile away, conduct their mapping and ventilation exercise and return, and the other team had to construct the bulkhead. After it was finished, about 11:15 a.m., the team waited for the mapping/ventilation team to return; when their lights were seen coming down the tunnel, David Hamm, Deputy State Mine Inspector conducting the training session, lit a smoke bomb.

Airflow up the tunnel—normally com-



Having finished constructing the bulkhead, the team gets ready to check each other's breathing apparatus for time available before they have to get out of the tunnel; from left are Jerry Cross, with Phelps Dodge; Mike Shivers, with Arizona Resources; Graham Pattison, with RMG Mining, Inc.; Victor Martinez, with Arizona Resources, and Neal Sabyan, with RMG Mining, Inc. Each breathing unit weighs 48 pounds.

parable to about a 10 mile per hour wind—had been drastically reduced. Only a little leaked around the edges of the bulkhead, and that could have been stopped if necessary. What air passed the bulkhead was enough to send a thick cloud of smoke up the tunnel to the approaching mapping/ventilation team.

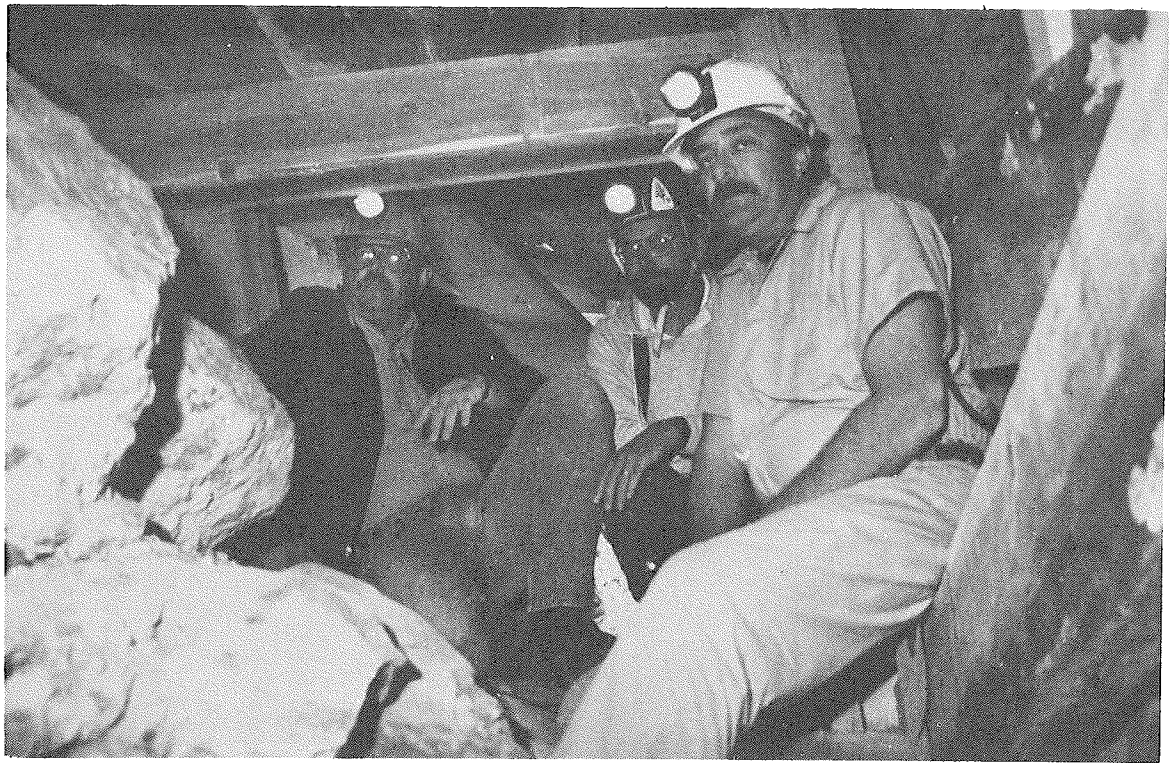
Each team member's self-contained breathing apparatus was functioning properly and all emerged safely through the door built into the bulkhead. They quickly compared notes, checked each other's breathing apparatus once more for time left and tore down the bulkhead. After lunch back at the mine office they would clean the equipment and go through a debriefing.

The underground miners who were participating in this training exercise were Ralph Ladner, Wayne Ladner, Tony Elley, Marty Wiggins, and Jerry Cross from Phelps Dodge Corporation's UVX Branch in Jerome; Mike Shivers, Victor Martinez, and Charles Huffaker from Arizona Resources' Budge Mine in Jerome; and Graham Pattison and Neal Sabyan from RMG Mining Inc.'s Mystic Mine northwest of Phoenix.

Reprinted from the April 1993 issue of Copper Queen Publishing Company's ***Southwestern Pay Dirt*** *of Bisbee, Arizona.*

Arizona's Kartchner Caverns get help from miners

Some old underground mining skills were used recently to assist state Parks Department officials who are planning development of the future Kartchner Caverns State Park in southeast Arizona.



Inspecting the work *Jeff Dexter (center), manager of Kartchner Caverns State Park, Gary Cothrun (left) and David Hamm, Deputy Arizona State Mine Inspectors, inspect some of the timbering inside the opening of the sink hole entry.*

The helping hand came from another state agency, the Arizona State Mine Inspector, and a neighboring mining company, Phelps Dodge Corporation's Copper Queen Branch in Bisbee, Arizona.

Unusually heavy rains have softened the earth and rock around the only

access to the caverns and it had become dangerous for Arizona State Parks personnel to enter. They contacted Douglas K. Martin, the Arizona State Mine Inspector, and in mid-February he dispatched two deputy inspectors to Kartchner Caverns.

"We are pleased to be able to assist another state agency," Martin said. "Our people are the experts; they have a lot of experience in active mines as well as dangerous, abandoned mines; when we can help make a project like this safe, all parties are better served."

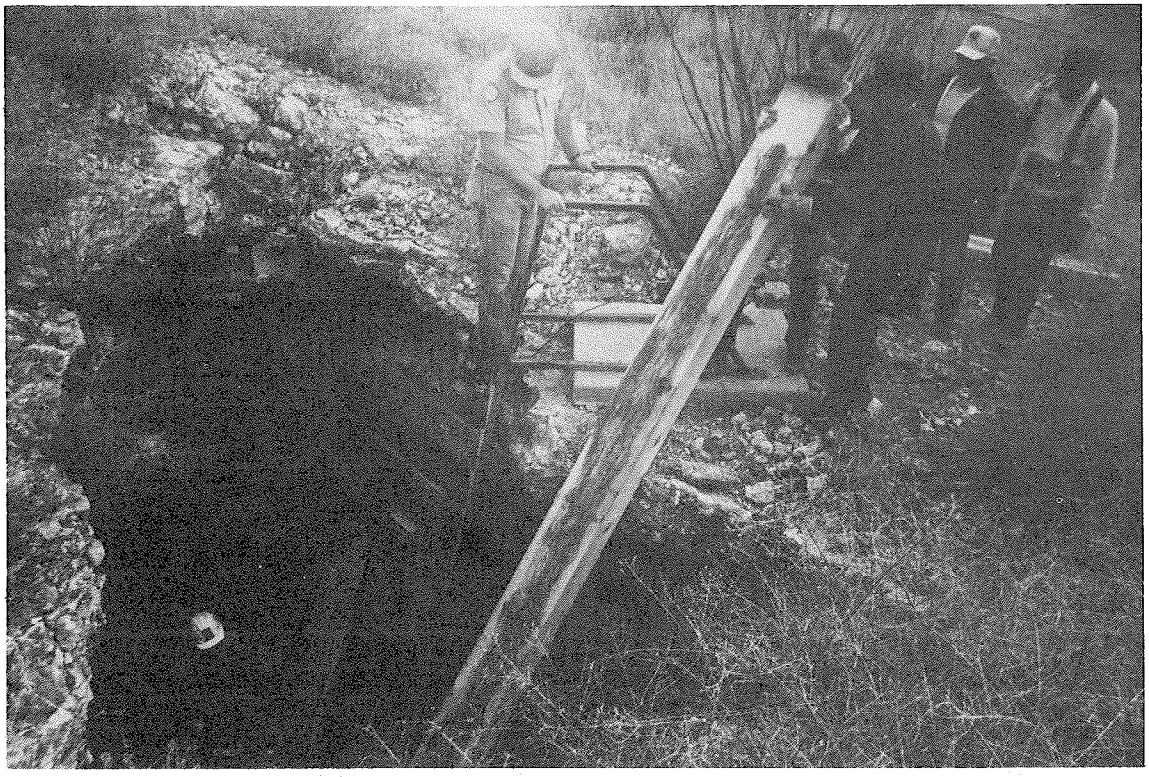
Experienced in underground mining, Deputy Inspectors Gary Cothrun of Globe and Dave Hamm of Tucson inspected the cavern opening with Jeff Dexter, manager of Kartchner Caverns State Park They confirmed what Dexter had suspected: it was too dangerous to continue using; the opening would have to be either closed or reinforced with timber.

"If this was an underground mine, we would have closed within a minute," Hamm said. "There was rock moving and in danger of falling at any time. In fact, one 40-ton slab overhead just inside the opening was rocking as we set a 16-foot 10x12 timber; it was very tense there for a minute."

After inspecting the cavern entry Hamm talked with management at Phelps Dodge in Bisbee and they offered to help stabilize the entrance. They donated timber and sent four miners to help with the project.

"One problem [with stabilization] is that park personnel have to keep this as environmentally pristine as possible," Cothrun explained. "On the other hand they have to enter the caverns periodically to monitor temperature, humidity, barometric pressure and other things so they can establish a base line to maintain when the caverns open for the public.

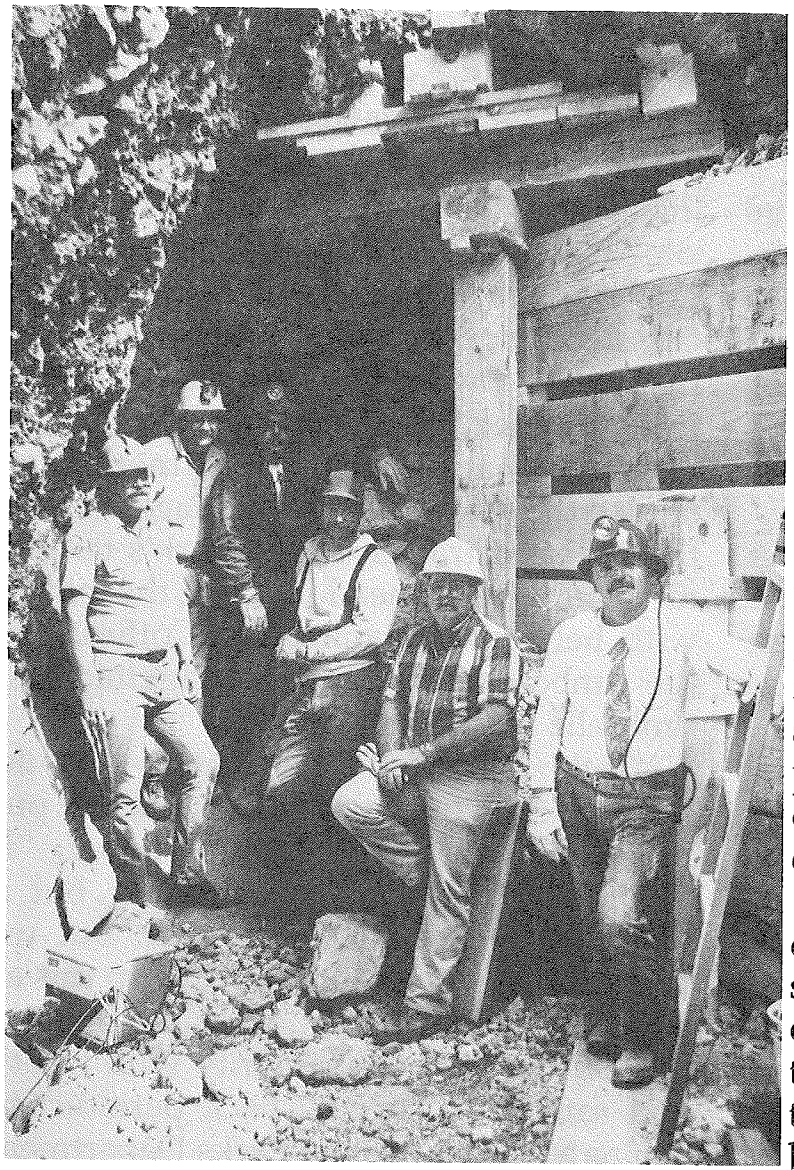
"If they are going to enter it, then the entrance had to be made safe. That's where our department's expertise came in. We're not used to working with natural caverns; we inspect underground mines—man-made openings in the earth. They are en-



Hauling timber *Jeff Dexter, manager of Kartchner Caverns State Park, and other Arizona Parks Department employees lower a 16-foot 10 x 12 timber down the sink hole for miners to install in the caverns opening, seen at left of the photo.*

tirely different than this; but a falling rock is a falling rock no matter where it is; and that we can work with."

The entry is an old sink hole that was known to ranchers in the area more than a hundred years ago, according to Dexter. In 1974 two young cavers from Tucson discovered the sink hole led to extensive underground caverns.



A Job well done *The crew takes a break before starting clean-up after timbering the entry to the caverns. From left, they are Gary Cothrun and David Hamm, Deputy Arizona State Mine Inspectors; Gary Torrez, underground miner; Jeff Dexter, manager of Kartchner Caverns State Park, and John Carbajal, underground miner.*

Located in a limestone hill at the base of the Whetstone Mountains in Cochise County, the towns of Sierra Vista to the south, Tombstone to the east, and St. David are visible from the opening.

Recognizing they had an exceptional find, the two young cavers kept it secret for years. Eventually they contacted the owners of the land, the James Kartchner family, who shared the secret and agreed it should have special treatment.

"The cave is located only half a mile from a state highway and other cavers were searching the limestone ridges of the Whetstone Mountains," Dexter said. "It was inevitable that someone would duplicate their discovery sooner or later, so they decided that only by sharing their discovery with the world could they ensure that the cave would remain as beautiful and pristine as it was when first seen by man.

"The cost of developing the cave was beyond their financial means so they began looking for an organization with the financial ability and dedication to their stewardship. This search required more people to become acquainted with the cave, increasing the risk of unauthorized entry.

"Eventually, Arizona State Parks emerged as the most enthusiastic sponsor of the project. A rare closed session of the legislature approved purchase of the 550-acre property allowing the state to establish site security only hours before the press announcement in 1988."

A two-year consulting contract with some of the original discoverers for environmental studies of the cave has been completed. It establishes the environmental parameters which must be main-

tained to keep the caverns alive and growing.

"This may be the first time such an effort has been undertaken before cave development," Dexter said."Usually these studies are started after a decline in cave conditions is noted."

The master plan for the park facilities also has been completed. Construction is underway for the roads, campgrounds, and visitor center. The campground could be open as early as late 1994, Dexter said, but the tunnel for public access to the cavern probably won't be completed until two years later.

With a humidity of 99.8 percent or more in the caverns, the 300-foot tunnel leading to them will have to have air locks to maintain that level.

"And there is a tremendous amount of work that will have to be done inside the caverns to make it safe for visitors without compromising its environmental integrity," Dexter said. "There are two and a half miles of passageways now and everything is covered with a layer of mud. Planning is just beginning on designing hardened pathways and other features to protect the caverns."

It is important to maintain the natural condition of the caverns, Dexter emphasized. "Most other caves have had a tremendous amount of change," he said. "Carlsbad Caverns, for instance, was a mine before it became a tourist destination. So was Mammoth Cave in Kentucky. In Kartchner Caverns, 75 percent of the floor has never been walked on."

Dexter estimates that only 200 people have entered the caverns since their discovery, most within the last five years. The largest number at one time was 10, when a team from National Geographic magazine photographed it in March, 1988, for publication the following year.

Entry from the sink hole is through a narrow passage, Dexter said, making it necessary to crawl on your stomach and squeeze through narrow holes for much of the 200 feet into the first cavern. Most of the way is considered safe, he said, but close to the surface the rock had begun to move so he felt it necessary to have it inspected and stabilized, if necessary.

The decision was made to keep the entry open but stabilize it with traditional mining methods. So on Tuesday and Wednesday, Feb. 23-24, Dexter and other State Parks personnel and Deputy State Mine Inspectors, Hamm and Cothrun, were joined by four men from the Phelps Dodge Copper Queen Branch in Bisbee: Baker Olmstead, supervisor of safety and security; and Gary Torrez, John Carbajal, and Ernie Jiminez, underground miners.

While State Parks Department men hauled the heavy timbers and lagging over the 225-yard trail from the park's temporary camp-trailer headquarters, the miners with help from Hamm and Cothrun set the timber caps and posts, lagging, and umbrella stulls.

"If this had been a mine site we would have mucked out most of the rock and put in nice square sets," Hamm noted. "It wouldn't have been any stronger, but it would have been a lot prettier. But we understand why they have to keep this as close to original condition as possible.

"Our concern is primarily with health and safety. We'll come back periodically just as a courtesy to the Parks Department to make sure the entry remains stable."

Reprinted from the April 1993 issue of Copper Queen Publishing Company's ***Rocky Mountain Pay Dirt*** *of Bisbee, Arizona.*

Safety belts proper use

Safety belts are your best protection in a crash. They are designed so that the forces in a crash are absorbed by the strongest areas of your body—the bones of your hips, shoulders, and chest. They keep you in place so that your head, face, and chest are less likely to strike the steering wheel, windshield, dashboard, or the vehicle's interior frame, and they prevent you and other occupants from being thrown into each other or ejected from the vehicle.

When you buckle up, use caution in the way you adjust your belt. Do not wear the belt **across your stomach** because the likelihood of serious injury increases dramatically.

Do not place the shoulder belt **behind your back,** as it cannot restrain your upper torso when it is in this position. Your head and chest could strike the steering wheel, the dashboard, or the back of the front seat.

Do not wear the belt **under your arm,** since this causes the belt to ride over the lower part of your rib cage. You could break ribs and sustain serious internal injuries.

The right way to wear your safety belts

Small adjustments in either the belt position or in your position on the seat can improve your comfort and make the belt work better in a crash.

The lap belt or lap portion of the lap/shoulder belt combination should be adjusted so it is low across the **hips and pelvis**, and never across the stomach. Adjust the lap belt so it is snug.

Wear it right!

The shoulder belt should cross the chest and the collarbone and be snug. The belt should never cross the *front* of the neck or face. Do not introduce excessive slack (more than one inch) into the shoulder belt.

If your vehicle has an **air bag,** you will notice that it also has a safety belt system. Air bags provide **supplemental** protection. They are effective primarily in protecting occupants involved in frontal collisions, but offer little or no protection in a side, rear, or rollover crash. *For maximum safety, lap and shoulder belts should always be used in air bag-equipped vehicles.*

In some vehicles, the shoulder belt comes across your chest automatically, but the lap belt must be buckled manually. *If your vehicle has a manual lap belt, it must be buckled for maximum protection.* Use the complete system the manufacturer installed in your vehicle and follow the instructions provided in the owner's manual.

Some vehicles have **shoulder belt adjusters** that allow you to move the shoulder belt upper anchorage. This feature makes it easier to adjust the shoulder belt so that it does not touch the neck.

The right way to sit

The way you sit when you ride in a vehicle is important. Your safety belts cannot work properly if you have the

seat back in a reclined position or if you are slouched in your seat. The shoulder belt will not be against your chest and the lap belt could ride up over your stomach.

For best protection, have the seat back upright and sit well back in the seat. Adjust your safety belts for a snug fit.

When children ride in your vehicle

Lap and shoulder belts do not provide adequate protection for infants and small children. They need the special protection of a child safety seat designed for their body size. **The best place for a child safety seat is in the back seat.**

Never use a rear-facing infant safety seat in the front seat of a vehicle equipped with an air bag on the passenger side.

Be sure to check the owner's manual about the correct way to install child safety seats in your vehicle.

Safety belts and pregnancy

Pregnant women should not be afraid to use safety belts. The main risk to the baby is injury or death of its mother, and motor vehicle crashes are a leading killer of women in their child-bearing years. Injuries and death to the baby are closely related to the extent of injury sustained by its mother. Since mothers who wear safety belts sustain fewer injuries than those who do not, risk to the unborn baby is reduced.

Buckle up in the back seat

As of December 11, 1989, all passenger cars (except convertibles) manufactured for sale in the United States must come equipped with shoulder and lap belts in the outboard (window) seating positions of the back seat. This rule was extended to require shoulder and lap belts in the outboard positions of the rear seat of convertibles, vans, light trucks, and multi-purpose vehicles manufactured after September 1, 1991.

Most vehicles manufactured before 1989 do not have combination lap and shoulder belts. **Retrofit kits** may be available for consumers who want them. To find out if a retrofit kit is available for your model vehicle, contact your dealer or call the National Highway Traffic Safety Administration's toll-free Auto Safety Hotline (800-424-9393 or 202-366-0123 in the Washington, D.C. metropolitan area).

Lap Belts: If your vehicle only has a lap belt in the back seat, wear it. Lap belts are proven safety devices. The belt will keep you in your seat and inside the vehicle during a crash. Remember to wear the belt low and tight on your hips and not over your stomach.

State Belt Laws: Most states have laws requiring safety belt use, and all states require child passengers to be in a safety seat. These laws have been extremely effective in increasing usage of belts and child safety seats and are responsible for saving thousands of lives each year. By obeying these laws, you take advantage of the best available protection in the event of a crash.

Reprinted from the November 1992 issue of the U.S. Department of Transportation's ***Consumer Information Bulletin.***

A challenge for all safety and health professionals

A recent review of the United States Department of Health publications reveals that the Office of Disease Prevention and Health Promotion has established several worksite objectives. These objectives affect both MSHA- and OSHA-governed industries and appear to be very realistic and attainable.

From the MSHA perspective, they go hand-in-hand with the goal of "Zero Fatalities by the Year 2000." All organizations working within the mining environment are challenged to accept and voluntarily meet the objectives that have been established.

When you do achieve these objectives, or if you have already achieved them, please advise the Texas Mine Safety and Health Program (TMSHP) staff so you can be appropriately recognized. They are:

Worksite health promotion by the year 2000

Increase the proportion of worksites offering employer-sponsored physical activity and fitness programs as follows:

Worksites with	1985 baseline	2000 target
50-99 employees	14%	20%
100-249 employees	23%	35%
250-749 employees	32%	50%
750+ employees	54%	80%

- Increase to at least 50% nutrition education and/or weight management programs.
- Increase to at least 75% formal smoking policies that prohibit or severely restrict smoking at the workplace.
- Extend adoption of alcohol and drug policies for the work environment to at least 60%.
- Increase to at least 40% worksites providing programs to reduce employee stress.
- Increase to at least 85% worksites that offer health promotion activities for their employees, preferably as part of a comprehensive employee health promotion program.
- Increase to at least 20% the proportion of hourly workers who participate regularly in employer-sponsored health promotion activities.

Worksite health protection by the year 2000

- Reduce deaths from work-related injuries to no more than 4 per 100,000 full-time workers.

Special targets: mining, construction, transportation, and farming

- Reduce work-related injuries resulting in medical treatment, lost time from work, or restricted work activity to no more than 6 cases per 100 full-time workers.

Special targets: construction, nursing, personal care, farming, transportation, and mining

- Reduce cumulative trauma disorders to an incidence of no more than 60 cases per 100,000 full-time workers.

Special targets: manufacturing and meat industry

- Reduce occupational skin disorders or diseases to an incidence of no more than 55 per 100,000 full-time workers.
- Reduce hepatitis B infections among occupationally exposed workers to an incidence of no more than 1,250 cases.
- Increase to at least 75% worksites that mandate employee use of occupant protec-

tions systems, such as seat belts, during all work-related motor vehicle travel.
- Reduce to no more than 15% the proportion of workers exposed to average noise levels that exceed 85 dBA.
- Eliminate exposures that result in workers having blood lead concentrations greater than 25 µg/dL of whole blood.
- Increase hepatitis B immunization levels to 90% among occupationally exposed workers.
- Increase to at least 70% worksite programs on worker health and safety.
- Increase to at least 50% worksite back injury prevention and rehabilitation programs.

Worksite preventive services by the year 2000
- Increase to at least 50% worksite high blood pressure and/or cholesterol education and control activities.
- Increase to at least 75% worksites with voluntary established policies or programs for the hiring of people with disabilities.
- Extend to all facilities where workers are at risk for occupational transmission of HIV, regulations to protect workers from exposure to blood-borne infections, including HIV infection.

The above list of objectives has been edited. To receive a complete list of objectives call the Government Printing Office (202) 783-3238. The full report is #017-001-00474-0 and is $31.00. The summary report is #017-001-0473-1 and is $9.00.

Electrical lockout accidents...*a plague to the mining industry*

by Robert E. Morgan, Virginia Department of Mines, Minerals, and Energy

What makes a person take the dangerous risk of working on electrically powered machinery prior to locking out? Safety professionals around the country ponder this question with the arrival of every new lockout FATALGRAM. According to the MSHA Metal Nonmetal Safety Division, five additional fatal accidents occurred in 1991 as a result of failing to lock out. In addition, numerous other nonfatal accidents resulted from this dangerous practice. ***Why do they do it?*** The number of lockout accidents clearly indicate that we have yet to eradicate this plague that has menaced the mining industry for so long. The lives that have been lost or irreparably injured implore us to find the answer.

Electrical lockout accidents in the mining industry usually involve at least three parties: the injured victim; the mine operator/employer: and the regulatory agency requiring the use of lockout safety devices. All of the parties play an important part, both before and after an accident. In order to find out why the accidents happen and the best way to prevent them dictates that we concentrate on the period before the accident happens.

In attempting to determine the reason why people fail to lock out, one must first identify the various factors that can influence such a flawed and often fatal decision. Although one's first impulse may be to lay blame squarely on the victim's shoulders, an in-depth analysis can often identify other significant factors. For instance, was the victim provided with a suitable lockout device that was readily accessible? Was the victim properly trained in the use of such devices and company rules requiring the use of such devices? And, finally, was mine management consistent in enforcing lockout rules? Any of these circumstances can influence the human factor of committing an unsafe act.

It seems clear that the answer to why they do it may often involve other people and things, not just the victim per se. In fact, some accidents have been the direct result of a supervisor failing to require an employee to lock out prior to starting a work assignment. An effective solution must address both the employee who may fail to lock out on his/her own, and the supervisor who may condone the unsafe act by failing to enforce company safety rules during a scheduled or unexpected work assignment.

Human and physical factors that can impair a person's safety awareness while working around electrically powered machinery can be mitigated by implementing the following safeguards:

(1) Suitable lockout devices should be provided to all employees who work in areas containing electrically powered machinery.

(2) Employees and supervisors should be given periodic training in electrical lockout rules and procedures.

(3) To facilitate the use of lockout devices, disconnect switches should be installed at, or near, electrically powered machinery.

(4) Supervisors who are responsible for the operation and maintenance of electrical machinery should make frequent checks to ensure that lockout devices are being used; incidents of failure to lock out should be documented for appropriate disciplinary action.

(5) Electrical lockout accident data published by state and federal safety agencies should be incorporated into company safety training sessions.

Implementing these safeguards into company safety programs would instill a sense of caution in employees and be reinforced by mine management on a frequent basis.

Why do people fail to lock out...because they fail to consider the immense risk to themselves as a result of their own unsafe act. FATALGRAMS describing grizzly lockout accidents serve as a reminder to us of just how unforgiving electrically powered machinery can be. If the menacing plague of electrical lockout accidents is to be eradicated, we must all work toward developing a better cure.

About the Author:
Robert E. Morgan has worked in the field of safety/health/environment for over twenty years. His various assignments have included work for government agencies such as NIOSH, HEW, and NASA; and the private mining industry. He currently works for a state agency enforcing safety, health, and environmental regulations.

No falls this Spring!

Slips and falls are the No. 1 cause of injuries at Arch of West Virginia (AOWV) and the No. 2 cause of unexpected death in the U.S.

There are two types of falls:

1. Falls on the "same" level, which happen more often, and

2. Falls from a "different" level, which tend to result in more serious injury.

Why falls occur:

• Falls happen when our body's center of gravity is extended "beyond" a natural stability line that runs through the center of our body.

• Under normal walking conditions, our foot rises off the ground only 5/8" at a brisk pace and only 1/2" at a slower pace. This explains why tree roots and uneven sidewalks can trip us up.

•Falls going up steps usually aren't serious, but falls going down steps often result in significant injuries.

•When walking down stairs, the critical part is when the ball of the foot comes into contact with the step. Don't "space out" on steps; pay attention to each foothold.

• Railings are important because they provide something to grab hold of; they also create a visual warning of an elevation change.

•Women tend to fall more often than men; their center of gravity is lower, and their shoes tend to be less stable (high heels and slippery soles).

How to prevent a fall

• Make sure all stairs at home and work are safe (handrails, treads, no-slip carpeting, proper lighting, etc.).

• Follow safety regulations when working in elevated places.

• Take your time going down stairs, no matter what your age.

• Carrying a load of any weight down stairs is especially risky. Make several trips with small loads, and be especially attentive to foot placement.

• Get in, and stay in, shape; it's easier to prevent an injury should you fall.

• Be careful of walking down stairs in stocking feet or slippers.

• At night, turn on lights—even if the stairs are familiar.

• Teach children to "walk" on stairs and not push.

• If you take nonprescription or prescription medication that makes you drowsy, be especially careful on stairs.

• Alcohol and stairs don't mix; be careful.

• Women should stick to flats and low heels.

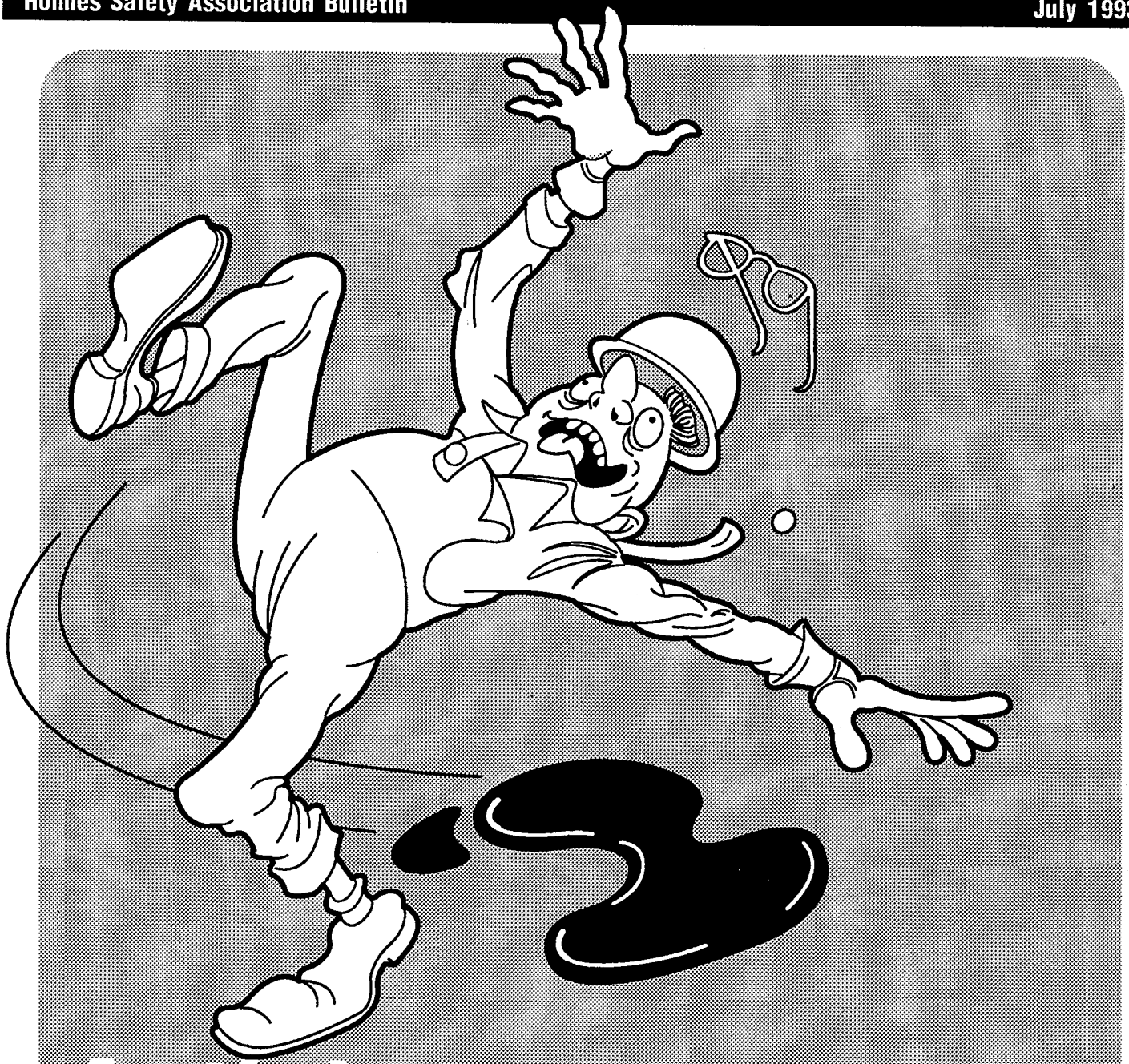
• Consider having nonslip soles or treads put on your dress shoes.

• Use common sense and appropriate shoes on water, snow, and ice. One moment's caution can save weeks of untold pain and medical expenses.

• Be alert to possible spills around toilets, sinks, vending areas, cafeterias, porches, and entryways.

• When you see a spill, clean it up or report it so no one will fall.

Reprinted from the May 1993 issue of Arch of West Virginia Employee Newsletter



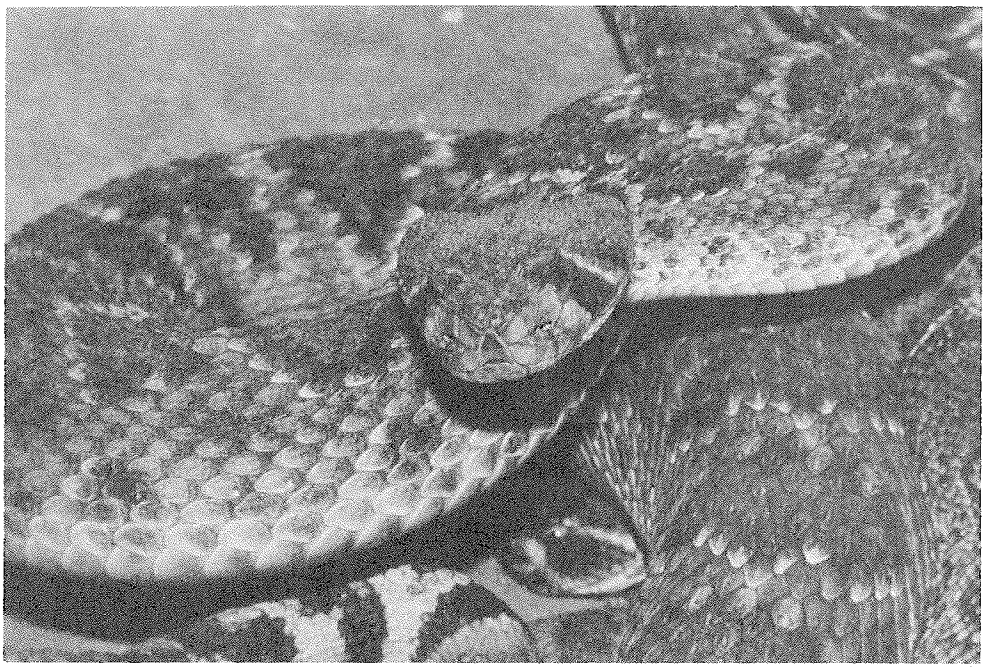
Anticipate and avoid fall conditions... Clean up spills!

Rattlesnakes

Robert C. Peterson, PE, Lone Star Industries, Inc.

With the coming of spring and warmer weather, mining must deal with an additional hazard—rattlesnakes. Understanding some of their habits and what to do if one is encountered can avoid a potentially serious incident. Knowing what to do in the event of a bite can reduce the seriousness of the injury.

Practically all areas of North America are inhabited by some species of rattlesnake. There is the Massasauga of the central and northeast United States, the Eastern Diamondback of the southeast United States, the Prairie of central and western North America and the Western Diamondback of the western United States and Mexico. In total there are 29 species of rattlesnake in North America.



Rattlesnakes tend to hide most of the time. Their coloration acts as camouflage. They usually live in dry areas. Arizona has the most number of species. Like all reptiles rattlesnakes have no metabolic temperature control (they are "cold blooded"). To function normally they must live in a region with an ambient temperature between 65° and 95° F.

Rattlesnakes are pit vipers. They sense their prey by heat-sensitive nerve endings in a "pit" on their heads. They lie in ambush and when their prey, usually small mammals and lizards, comes by, they strike and inject venom into the victim. This eventually kills and starts the digestion process. One myth is that rattlesnakes can spit their venom. Some cobras are able to do this, but not rattlesnakes.

Rattlesnakes defensive behavior is divided into three strategies. First, they will try to hide. Next, they will attempt to run away, especially from a large animal such as a human. Lastly, if left with no alternative, they will fight. Some species, especially the Western Diamondback, can be aggressive. All of the species tend to be belligerent after shedding their skin.

There are differences in the toxicity of the venom from different species. Eastern

Diamondbacks are at the top of the list, followed by the Western Diamondback. Factors affecting the gravity of the bite include age and overall health of the victim, whether the bite is on an extremity or in a blood vessel, how deep a bite is inflicted, the number of bites and the availability of medical help.

The most important act of first aid in a snakebite is to keep the victim calm. If possible apply suction to the wound (several types of suction snakebite kits are available). **DO NOT** apply tourniquets or ice. Most important, get the victim to professional medical attention ASAP.

The best procedure is to avoid being bitten. Always remain alert, especially around remote or seldom used areas of the mine. Don't put your hands or feet where you can't see. Avoid dark, cool places on hot days. Don't move objects with your hands or feet; use a bar or mechanical means. Don't let trash build up in corners. If you hear a rattler, freeze and locate the snake. Look around to see if any others are present. Then back away from the snake slowly and alert other workers in the area.

The best medicine for snakebites is not to get bitten—

Be Alert—Look and Listen.

Flyrock...*a blaster's worst nightmare*

by Robert E. Morgan, Virginia Department of Mines, Minerals, and Energy

Over the years, the mining industry has developed many terms to describe various things or events associated with the production of minerals. Few terms in this category can provoke the degree of nightmarish images as does the term flyrock. The high degree of anguish brought about by the term is justified by the serious potential for property damage or personal injury normally associated with uncontrolled flying material generated by a blast. For the blaster in charge of the blast and the mine operator who assumes overall responsibility, the mention of the word often is only the beginning of long and costly confrontations with adjoining property owners and regulatory agencies.

In recent years, the explosives industry developed many products which have improved fragmentation and overall safety; however, a safe and effective product is only one half of the equation. Blasters who use the products must ensure that they are used in a safe and effective manner. A recent analysis of blasting incidents in Virginia revealed that flyrock often occurred as a result of:

- shallow boreholes used to eliminate toe on the face,
- insufficient stemming of boreholes, and
- inadequate burden around boreholes drilled at an angle.

Shallow boreholes (snake holes) used to break "toe" on the face can often be eliminated by increasing the amount of subdrilling in the front line boreholes and loading the bottom portion with a high density explosive product.

The risk of flyrock resulting from insufficient stemming of boreholes can normally be eliminated by ensuring a 1:1 ratio of borehole stemming to burden.

Flyrock resulting from inadequate burden was the culprit in many incidents where rock was thrown in excess of one thousand feet with subsequent property damage. In most instances, angled boreholes were used in the front row of the shot. When angled boreholes are used, there is often an increased risk of flyrock from inadequate burden. The risk can be significantly reduced by changing the direction of face development when mining an inclined stratum. In most cases, better fragmentation and ground control can be achieved by blasting perpendicular to the strike (plane) of the stratum. If angled boreholes must be used, burden should be accurately measured by mechanical means (burden pole) or the newly introduced laser profiling system.

Using techniques that minimize the risk of flyrock is only one factor that must be taken into account by the certified blaster. A successful blast is the culmination of several important factors that must be taken into consideration; these include the following:

- evaluation of the rock strata
- design of the drill pattern
- design of the detonation sequence
- calculation of powder factors
- compliance with state and/or federal blasting regulations
- sensitivity of adjoining property owners
- good judgment by the blaster in charge.

A miscalculation or flawed judgment by the blaster in any of these factors may result in undesirable results such as flyrock. In order to prevent flyrock or other undesirable effects, mine operators must ensure that their blasters are competent in all factors relating to both drilling and blasting. This is the reason that Virginia, and some other states, have adopted regulations requiring training and certification of blasters.

The focus of any blaster's training and certification program must be directed toward designing a blast that produces the desired fragmentation with the least potential for personal injury or property damage. Unfortunately, we can never totally eliminate the potential for error in any given situation, but the blasters in charge must assure themselves that they have considered all of the relevant factors and designed the blast to the best of their ability. When this has been accomplished, the chance of error is greatly diminished and overall safety improved.

There is also an obligation for the regulatory agency having responsibility for investigating accidents involving flyrock or explosives in general. The investigation should focus on the **cause** of the incident and specify preventive measures based on sound blasting practices. In most instances, design or loading factors are the most common causes of flyrock. And finally, the information relating to the cause of flyrock and preventive measures must be disseminated to other blasters in the mining industry in order to prevent a similar occurrence. The investigation report should serve as a vital education link in the agency's effort to reduce blasting accidents.

As with most accidents, the nightmare of flyrock can best be avoided by using prevention techniques in all stages of the blast; planning, drilling, loading, and detonation. Blasting has been, and continues to be, both an art and a science which relies heavily upon good judgment by the blaster in charge.

About the author: *As a representative of Virginia's mine safety/reclamation enforcement agency, Robert E. Morgan enforces state blasting regulations, investigates blasting complaints, and teaches explosives safety and blaster certification classes. He also developed the agency's blaster training course and served as chairman of the state's advisory committee on explosives.*

Welding around explosives

Two recent incidents reported by Canada's Mines Accident Prevention Association of Ontario (MAPAO) demonstrate the potential hazards of using welding or cutting equipment in workplaces where explosives are used.

In the first, a welder employed by a MAPAO firm was attempting to remove a JS600 LHD engine subframe by flame-cutting. He had removed the engine and was standing in the engine cavity cutting an engine mount. Because of the low lighting conditions, he was leaning quite close to his work to see his cutting. As the torch cut through the subframe, the flame or slag ignited a Nonel cap that had become lodged behind the frame in an area that was boxed in on three sides and which could not be seen. The explosion caused small lacerations to his face, but his welding goggles prevented injury to his eyes.

In the second incident, a boilermaker working at an out-of-province mine was attaching a length of used drill steel to the edge of a scoop bucket to act as a wear component. One length had already been welded to one side of the bucket and a second length tack welded on the other side. He was in the process of heating the steel using an oxy-acetylene torch to bend it to conform to the shape of the bucket before further welding. There was an explosion and the boilermaker was killed instantly. Upon examination of the first length of drill steel to be attached, it was found that the first 5/8" of core was blocked by tightly-packed material which turned out to be ammonium nitrate—(ANFO). It is probable that the length which exploded had been cut from the same drill steel.

Precautions taken to avoid a recurrence of the first incident included reviewing current practices and creating separate procedures for transporting, handling and storage of explosives. The new procedures were reviewed with all underground crews.

Recommended preventive measures for the out-of-province incident were limited to checking the core of used drill steel for blockages before discarding it or before using it in any process involving cutting, heating, or hammering. A more thorough investigation would have addressed the issue of how explosive material got into the steel in the first place.

Reprinted from Ontario, Canada's, Mines Accident Prevention Association's February 1993 issue of ***Incident Report.***

Holmes Safety Association Monthly safety topic

Fatal powered haulage accident

GENERAL INFORMATION: A 35-year-old truck driver with 7 years of mining experience was killed when he lost control of his truck while negotiating a sharp curve, tried to jump to safety, and was run over by the truck. The operation is a contour strip mine using independent contractors to haul coal.

DESCRIPTION OF ACCIDENT: On the day of the accident the victim began his shift at 6:00 a.m. by transporting coal to the preparation plant via access haulage roads. The distance along the 35 foot wide haulage road to the preparation plant was 7.3 miles and the descending grade of the haulage road involved in the accident averaged from 8.3 to 18 percent for a distance of one mile. There were no escape ramps and/or barriers for emergency use. Traffic rules and warning signs had not been posted along the roadway to warn coal truck drivers to use lower gears and travel at slow speeds. The fifth truckload of coal was hauled by the victim about 1:00 p.m.

Another truck driver stated that he stopped at the top of the hill and briefly talked to the victim while he was waiting to load his own coal truck. The conversation consisted of how many loads of coal they had hauled during the day. The victim then loaded the coal truck and left en route to the preparation plant. During this trip he conversed with the owner of the trucking company about the maintenance performed on the truck.

The trip apparently continued without incident until he approached the last sharp curve near the bottom of the haulage road. At that point he apparently lost control of the truck, and he immediately communicated via CB radio to the other drivers that the truck was out of control.

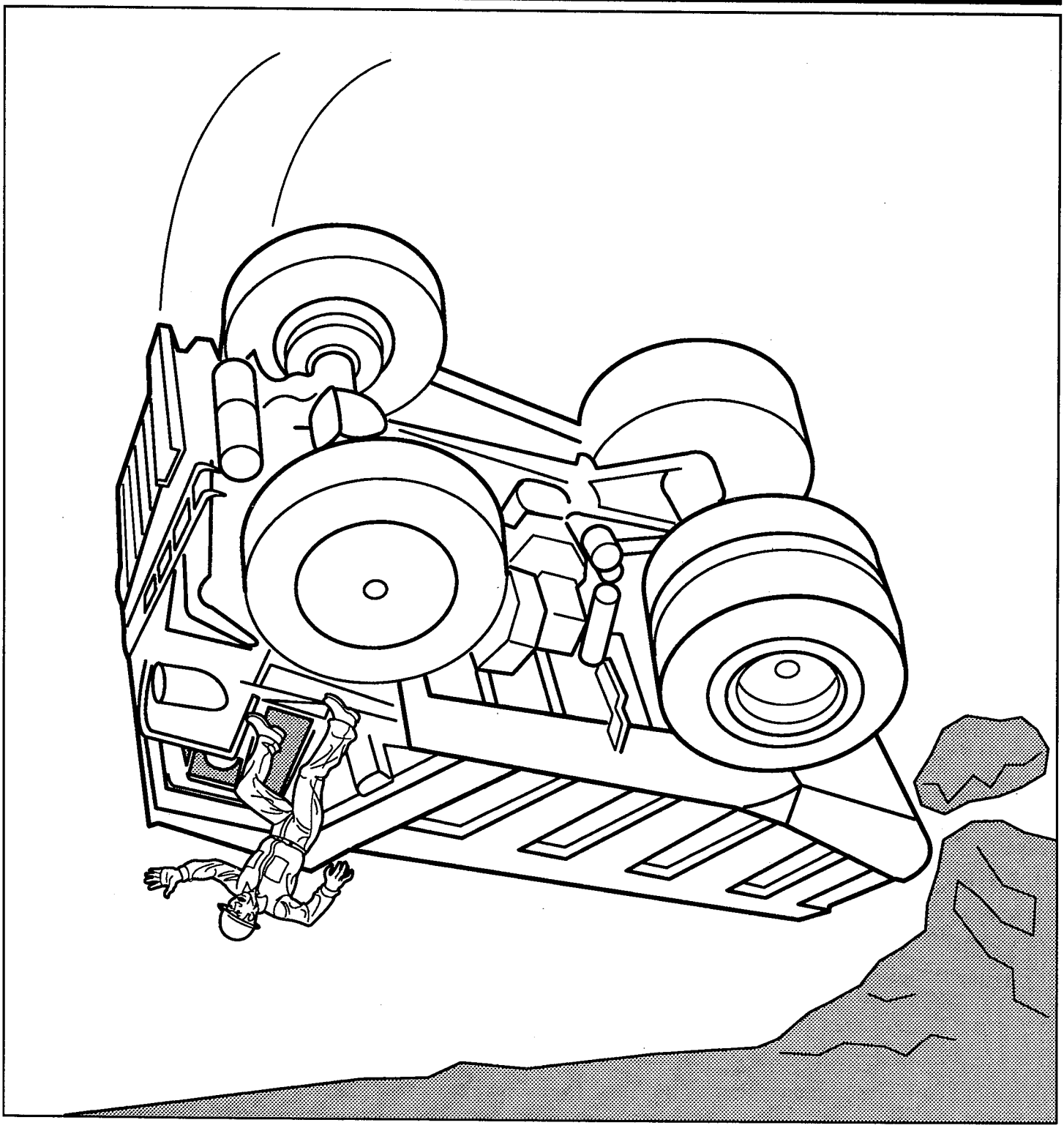
Another truck driver heard the victim say that his truck was out of control. He stated that he had just started onto the coal haulage road near the switchback when he observed the victim's truck pass by the switchback at a high rate of speed and enter the upper road where the road forks at the switchback. The victim's truck ran up on the roadway embankment and rolled over, turning upside down. The truck came to a stop on the lower roadway.

He did not see the victim jump from the truck and called the tipple attendant via CB radio and informed him that a coal truck had wrecked.

The tipple attendant immediately called an ambulance and the plant foreman.

The other truck driver arrived at the scene and observed the gravely injured victim lying facedown on the roadway.

The victim was examined by paramedics and transported to the hospital where he was pronounced dead on arrival by the county coroner.



CONCLUSION: The accident and resultant fatality occurred because the operator failed to ensure that the required daily inspection was conducted; maintenance of the truck's braking systems was inadequate; the grades of the coal-haulage road were too steep for the payloads being hauled by the coal trucks; and no runaway ramps were provided.

Ammonia exposure underground

by Jim Armstrong, Industrial Hygienist, MAPAO

In high enough concentrations in air, ammonia causes the eyes to water and irritates the nose and throat. This is a familiar sensation for many underground miners. Many mines in Canada have problems controlling workers' exposure to ammonia. It is often a source of complaints to supervisors and worker representatives. Where does it come from? How does it get into a mine? What health effects does it have? How can it be controlled? These are questions that are often asked by miners.

Health effects

Ammonia is a colorless gas with a sharp, intensely irritating odor. It is known as an irritant gas, which means that it will irritate the eyes and upper respiratory tract during low-to-moderate exposures. Most underground exposures are at this level. As concentrations increase, however, the effects become increasingly intolerable. Single massive exposures to ammonia have resulted in permanent damage to the airway and lungs, and even death. The effects of ammonia at various concentrations are shown in Figure 1.

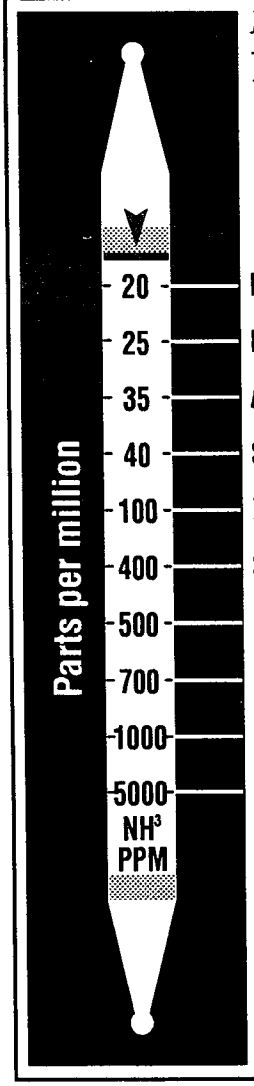
Where it comes from

One source of ammonia in the underground work environment is the blasting agent commonly called "ANFO", an acronym created from the first letters of the words ammonium nitrate and fuel oil. Some of the product names for ammonium nitrate and fuel oil explosives are AMEX, NUMEX, LOMEX, and NILITE.

The explosive nature of ammonium nitrate became obvious in the 1940s when, on more than one occasion, ships carrying fertilizer in their holds exploded with devastating results. Perhaps the most notorious case occurred in the harbor of Texas City, Texas, in April 1947, when a ship carrying ammonium nitrate experienced a fire in its hold and exploded. Approximately 600 persons were killed, 3,000 were

Figure 1

Effects of ammonia



Modified to reflect MSHA/NIOSH standards

injured, and property damage exceeded $58 million.

Since that time, we have learned to both harness the explosive power of ammonium nitrate and maximize its explosive efficiency by adding fuel oil to it. Fortunately, we treat ANFO with respect because we know the devastating consequences if we mishandle it and trigger a chemical reaction—BOOM!

Just add water

Unfortunately, there is a chemical reaction that ammonium nitrate can undergo in the presence of another substance that we don't control nearly as well. That substance is water with a pH of 8 or more.

The pH is a measure of how acidic or basic a substance is.

Drinking water usually has a pH of 6.5 to 8. A number less than 7 is acidic (vinegar has a pH of 3) and a number above 7 (to a limit of 14) is basic (calcium oxide, a major component of cement, has a pH of 12.5 when dissolved in water).

When basic water (pH 8) and ammonium nitrate come into contact, the chemical reaction releases ammonia as a gas which floats up (ammonia is lighter than air) and is inhaled by the miner, causing the irritating symptoms with which we are all familiar. The simple experiment of placing these ingredients in a plastic bag and then carefully sniffing it will prove the point.

The amount of ammonia released into the air in a mine will increase with the amount of basic water and ammonium nitrate available to react. For example, if we spill half a bag of ANFO on a floor that is wet with water that has come into contact with cement, we can expect that there will soon be ammonia in the air, as ammonium nitrate dissolves as easily in water as sugar does in your coffee. Similarly, if we spill the same amount on a dry floor and it is eventually transported with the muck to a crusher where basic water is added, ammonia will be generated at the crusher and the crusher operator will suffer the symptoms of exposure.

Controls

The answer to the problem is to control the contact of ANFO and water. Our training tells us the best way to control a hazard is at the source. There are several things that can be done to help control the problem at the source.

First, care must be taken to avoid spills of ANFO during transportation and handling.

Second, loading should be completed with extra care. If the flow on the pneumatic loader has not been adjusted properly, blowback or improper compacting of the charge occurs. Both situations result in wasted blasting materials, either through spillage or failure to detonate. Loading boreholes to the collar is usually unnecessary for good fragmentation. Difficulties with detonation may also be encountered if agents are loaded into wet holes.

Third, drilling must be accurate to maintain proper distances between boreholes. Where drilled holes are started too close together or angle towards each other, the detonation of one hole may affect the adjacent hole, causing it not to detonate. The undetonated explosives then end up in the muckpile.

Finally, any unused ANFO that remains at the end of the shift should be returned to the magazine, **not** dumped on the muckpile.

The environment

In addition to the occupational health problems associated with the careless use of ANFO underground, environmental problems develop on surface as well. Any undetonated material which is dissolved in water underground can make its way into the mine dewatering system and be pumped to mine water treatment facilities at the surface, and eventually find its way into the natural environment. Treatment facilities are designed to remove heavy metals from water. They aren't designed to remove ammonia. The ammonia-laced water ends up flowing downstream with the treated water, harming aquatic life. Elevated concentrations of ammonia in aquatic environments are directly toxic to fish, especially sport fish such as trout.

So there are two incentives for miners to reduce the amount of spillage of explosives underground: first, to make their environment more comfortable during working hours; and second, to make their environment more enjoyable after hours by helping to guarantee that the "big one" will be there waiting for them.

Reprinted from the Ontario, Canada's Mines Accident Prevention Association's Spring 1993 issue of ***safety news.***

Musculoskeletal injuries (MSIs)

Try this. Using your right hand with your wrist straight, squeeze the first two fingers of your left hand hard enough so you have difficulty pulling your fingers free. Now try the same thing with your right wrist bent to 90 degrees. You should now notice a loss of grip strength and be able to pull your fingers free more easily. You may even notice a slight pain in your right forearm as you strain to maintain your grip. That's because you can apply about 40 lbs. of force with your wrist straight, compared to only 15 lbs. when bent. Your muscles must work harder to do the same task.

If your job required frequent use of arm or hand muscles with bent wrists, you would become a prime candidate to develop an MSI. MSIs are injuries to muscles, tendons, nerves, joints, etc., that result from overuse or misuse over a period of time. Thus they are often called cumulative trauma disorders (CTDs) or repetitive strain injuries (RSIs). Lower back pain, carpal tunnel syndrome and tendonitis are among the most common examples.

The best approach to preventing MSIs is an effective ergonomics program: i.e., designing or redesigning the work environment (tools, equipment, processes, etc.) to fit the physiology and psychology of workers, rather than expecting them to adapt to the environment. Administrative controls that lessen exposure time to hazards are a second line of defense. As with other forms of personal protective equipment, aids such as wrist splints or back support belts should be used only when engineering and/or administrative controls are insufficient or impractical.

Another approach when ergonomic redesign is not possible is brief, but regular, stretching exercises, similar to those used by athletes. Repetitive motions or

sustained postures cause muscles to tighten. This reduces blood flow to hard-working tissue, depriving them of nourishment and allowing wastes to accumulate. The proper stretching exercise performed for one minute every hour or two can restore circulation, thus helping to prevent injury.

A new, one-day course is available on the ergonomic approach to preventing MSIs. If you would like more information on the *Musculoskeletal Injuries Prevention Program* (MIPP), give us a call at (705) 472-4140 [Remember, this is in Canada].

Reprinted from the Canadian Mines Accident Prevention Association's March 1993 issue of ***Safety Reminder.***

Continuous improvement

That's the key to survival and success in today's increasingly competitive world. Continuous improvement means getting a little better each and every day at what we do—improving productivity, improving quality, **and** improving safety. You can't have one without the others because all three are the result of the same thing—doing the right things right, first time, every time!

Total Quality Continuous improvement comes not from working harder, but from working smarter. In an effort to work smarter, many companies have begun to adopt a philosophy of organizational management called Total Quality. Total Quality teaches us that two of the most important requirements for continuous improvement are constantly improving work processes and the total involvement of all employees. Both have implications for safety.

Process Improvement The old method of ensuring quality usually involved an inspector at the end of the production line checking for defects. The Total Quality approach measures and evaluates the production processes to find and correct the causes of defects before they occur. It is proactive rather than reactive. In safety, an accident is a defect. Waiting for an accident in order to identify problems is reactive. Planned inspections, ergonomics, job/task analysis and system safety techniques are examples of proactive approaches to prevent accidents/defects before they happen. They also contribute to improved productivity and quality.

Total Involvement These proactive approaches work best if all employees are committed and involved. Total Quality takes seriously the phrase "Our employees are our most important investment." Total Quality companies invest in training to improve knowledge and skills; and they give employees as many opportunities as possible to use their brains rather than just their hands. Front-line employees are usually key players on problem-solving teams to improve ergonomic design, modify equipment, develop new procedures or in other ways improve the workplace.

"If it ain't broke, don't fix it" just ain't good enough any more. If you would like more information on the continuous improvement tools offered by Total Quality, contact Doug Bennett at MAPAO.

Reprinted from the Canadian Mines Accident Prevention Association of Ontario's May 1993 ***Safety Reminder.***

Management style makes the difference

As we move into the decade of the 90's we see a new type of management style emerging in industry and it centers around one single word, "attitude." When a company adopts a positive management style that is concerned about people's attitude toward safety and production, a company will go forward and grow.

Too many times we let ourselves lose sight of our objective of properly managing people and we tend to get complacent about it, but in today's very competitive market the complacent people and companies will get left behind and, as businesses, we can ill afford for that to happen if we intend to survive the lows in today's market.

As a company we have to go forward with low cost, high production, safety, and communications. Even though mining is our primary objective we are also a people company and that brings us to the word, "attitude." It adjusts everything we do in life. Think about it; as a supervisor if you do not have the right attitude your performance will never be up to standard and the same goes for the people you manage. Always keep in mind that attitude can, and does, affect production and safety. How well, or safe, a job is completed or even how much production or additional production is turned out will depend on you and your management style.

Companies using positive management style in the last few years have broken both safety and production records, but that's just the tip of a success story. With correct attitudes firmly implanted, they can, and will, continue to break their own records over and over.

At any company, selling safety is not just the job of the Safety Department, it is the daily task of every management person, right down to the front-line supervisor. Remember, if you are going to continue to improve production and reduce cost, you have to do it with people. You cannot expect people to produce if they are not convinced that you are concerned about them and their safety. So it's up to all of us to continue to adjust attitudes through good communications. It has always taken great people for a company to be successful in safety and production—people just like you and me that believe in ourselves and our people's ability.

Your management style ***does*** make a difference.

Reprinted with permission of Harold L. Boling, Safety and Hygiene Supervisor, Phelps Dodge Morenci, Inc.

TRAM XX (Training Resources Applied to Mining)

August 8-11, 1993, University of Kentucky, Lexington, Kentucky

TRAM XX is a unique conference about the use of training resources in the mining industry. This three-day conference is designed for professionals who want to enhance their training skills and keep up with conceptual and technological advances. For more information/brochure, contact Mary Lou Johnson, Coordinator, at (606) 257-2846.

Fellows wins Al Geiser safety award

Arizona's most prestigious safety award was presented during the Southwest Safety Congress annual meeting to William G. "Bill" Fellows, education and training coordinator for the Arizona State Mine Inspector's office.

The Al Geiser Award is given each year to an individual who has made unusual achievements in the field of safety, selected by the board of directors of the Arizona Chapter of the National Safety Council and Southwest Safety Congress. The award is presented at the congress to the person, "who, by example, inspires others to excellence in safety," according to the council.

William G. "Bill" Fellows

Fellows has worked with the Arizona State Mine Inspector's office 20 years and was instrumental in the development of safety programs for inspection, training, specialized areas of noise control, dust measurement and related health fields, as well as a wide range of education and training programs for the mineral industry in Arizona and the Nation.

Al Geiser was an employee of Arizona Safety Equipment Company and received the first award from the National Safety Council's southwest chapter posthumously in 1974. Fellows received his award at the most recent Southwest Safety Congress held May 25-28 at the Phoenix Civic Plaza.

Fellows was successful in developing and implementing the federal Mine Safety and Health Administration's education and training programs for the state of Arizona shortly after Congress mandated them in 1977. The increase in mining activities in Arizona has resulted in more than 11,000 miners being trained in just the last three years alone, through Fellows' efforts.

In his present position he has a statewide responsibility for planning and administering programs to promote industrial health and safety to meet the needs of the mining industry for the state of Arizona. There are some 19,000 mining personnel in Arizona who benefit from the training programs, developed and coordinated in large part by Fellows.

In conjunction with receiving the award, Fellows announced his tentative retirement from the State Mine Inspector's office. He said he plans to keep on working, however, as Chief Executive Officer of the Joseph Greer Institute, Inc., headquartered in Reno, Nevada. The company specializes in lowering liability risks and claims costs through educational modules and personal tutelage of businesses falling under the control of the U.S. Department of Labor.

The last word...

"You may already be a loser."—*form letter received by Rodney Dangerfield.*

"Nothing succeeds like the appearance of success."

"Part of the secret of success in life is to eat what you like and let the food fight it out inside."

"It is impossible to enjoy idling unless there is plenty of work to do."

"If you tell the truth you don't have to remember anything."

"The future is like the present, only longer."

"It is easier to get forgiveness than permission."

"People who think they know everything are very irritating to those of us who do."

"There is something about a closet that makes a skeleton restless."

"Fanaticism consists of redoubling your effort when you have forgotten your aim."

"Cats are smarter than dogs. You can't get eight cats to pull a sled through snow."

"Remember that a kick in the pants is a step forward."

"Bad spellers of the world, untie."

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 1993 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