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# **BULLETIN**

## *November 1996*

**INSIDE:**  
*Preventing silicosis*  
*Test your knowledge*  
*Beyond picks and shovels*

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

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

THIS MONTH'S COVER: Thanks to H.L. Boling of Phelps Dodge Morenci, Inc. for this month's cover photo of one of PDM's operations in Arizona.

LAST MONTH'S COVER: Thanks to those of you who contacted us. In our haste to put a photo on the cover and due to a lack of photos, we neglected to run the picture by our coal specialists who also let us know that we were, indeed, in error—the bolter *did not* wear safety glasses as he was required. We regret the error.

**KEEP US IN CIRCULATION  
PASS US ALONG**

## Face forward

**What will tomorrow's miners look like? Most say a lot like today's. The news is that industry is going to have to start working harder to get and keep them.**

by Christine A. Adamec

Who needs a top computer science graduate? A multilingual trainer? A savvy international negotiator? America's mining industry, for one.

And the challenge mining companies increasingly will face in the future is how to attract and keep employees with appropriate skills and experience—skills the average citizen doesn't necessarily equate with mining.

Just exactly who will choose to dedicate their lives and labor—both hourly and salaried—to the industry that extracts the materials needed by Americans to build their homes, manufacture their cars, run their computers and produce the products that so many use unthinkingly each day? Mining companies need to know now, so they can forecast future staff sizes, budget appropriately for competitive salaries and benefits, plan employee recruitment, and work with America's educators and legislators to ensure a future work force that will enable the United States to compete successfully in the global marketplace.

This article examines basic demographics of today's mining worker and projects into the future: age, gender, race and skill levels. In addition, it explores key issues that directly affect who the miner of the future will be—such as excessive environmental regulatory constraints, globalization and the industry's public image. These factors, among myriad others, will work together to shape the type of miner and mining skills needed in the future.

Today there are nearly 250,000 people working in six key hardrock segments in the United States. Add

nearly 100,000 coal industry employees, and the total amounts to more than 300,000 Americans working directly in mining. (Note: these figures do not include the tens of thousands of other Americans working in industries that process minerals and manufacture them into finished products.)

Any industry's success is impacted by the abilities of its work force—its talent, its creative thinkers and problem solvers. As is the case with many U.S. industries, it's no secret that the number of American mining jobs has decreased over the past decade due to a variety of factors—increased efficiencies stemming from automation and use of technology; cutbacks in development and expansion of domestic mines due primarily to excessive regulatory hurdles, and other trends. While these influences are explainable from a business perspective, they could cause understandable apprehension in prospective mining industry workers.

Indications are these trends will continue over the near term. The Bureau of Labor Statistics (BLS) predicts the mining industry (metals, nonmetallic minerals, and coal) will decrease by some 20,000 jobs from 1992 to 2005. The Fall 1995 issue of *Occupational Outlook Quarterly* predicts a more drastic decrease of nearly 62,000 jobs over the period 1994-2005. As a result, many people with the skills required by the industry may not consider a career in mining and will opt for other fields instead. The question is, how can mining best cope with this scenario?

### **A look over the shoulder**

One way to predict future trends is to look at past events, and probably the most dramatic impact on the mining work force in recent memory was the reduction experienced by all segments of the industry in the early 1980s.

Jobs were plentiful in the early- to mid-1970s. As a result, many college students chose to major in engineering career fields. According to Dr. Eileen Ashworth, professor of mining engineering for the South Dakota School of Mines & Technology in Rapid City, S.D., 3,000 undergraduate students were enrolled in mining career fields by 1980.

Then came the downturn, caused by an overall bad economy, increased efficiencies eliminating the need for some jobs and pressures created by an environmental lobby intent on imposing many new regulations and rules on mining activities.

Predictably, as the job pool declined, engineering students increasingly turned away from mining as a career. By 1987, the number of mining engineering students dropped to 500 nationwide. Ashworth knows a graduate who became an insurance salesman, for instance, and who considered mining too risky to come back to. Today the number of mining students in the United States has rebounded to about 800—an improvement, but still far below the heyday of 1980.

The downward trend also was reflected by membership drops in such organizations as The Society for Mining, Metallurgy, and Exploration in Golden, Colo. This group of individual mining professionals fell from a high of 28,734 total members in 1983 to a 1996 membership of 16,810.

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**The average Joe**

Today, the average mining worker is a 42-year-old white male, who has 18 or more years experience, according to the Energy Information Administration. One pressing question is, what will this average miner do over the next 10-15 years? Retire? Keep on working? How long?

And whether he stays or goes, the industry's human resources professionals worry about a worsening shortfall of skilled workers and mid-level engineers to follow behind him. The entire labor force in the United States is being impacted by the fact that the baby boomer population (born 1946- 1962) is 'aging out.' As a result, the United States is entering a period of a labor shortfall of workers in their late teens and twenties. Over the next ten years, there will be strong competition for these workers in all industries, including mining.

So predicting the average age of the hourly miner or the salaried worker in the mining industry of the future is virtually impossible, although many experts say it will remain about the same.

And then, of course, there's the economy. Where will that be within the next 5 to 10 years? Will it be such that the average miner can afford to retire sooner rather than later? Will he have other opportunities outside the industry?

**What about Jane?**

It's no stretch of the imagination to predict that men will continue to dominate the mining field, in part because women were late entrants to the industry. It was only 1973 or so when women were actively recruited into mining. And less than a decade later, when the layoffs of the early 1980s occurred, women were usually the most junior workers and often were laid off first. As a result, hourly women miners represent less than 5 percent of the work force today, a trend unlikely to change in the near future.



There are regional variations. Statistics up to 1993 indicate that in some states, such as Alaska, women represent about 10 percent of those people working in mines. This may be due in part to the favorable state laws for mining in Alaska which make it economically feasible for companies to employ a larger work force.

Another factor which could affect the hiring of women is technology. "Intelligence is not gender-specific," says Steven Carlton, president and CEO of Gold & Manganese Resources Company in Emily, Minn. "When you look at the high-technology end of it, mining is no longer a bunch of guys digging dirt and rolling around in the mud." As a result, brute force is less and less important in the mining field, and hence more openings could be expected to be available to females.

Ashworth agrees that high tech has affected mining employment and points to the use of global positioning systems (GPS) and remote control for underground equipment as examples. "You can send a piece of equipment into an area where you wouldn't send a person" because of safety and other concerns, she says.

The "up" side to this trend is that newer and better equipment can free people up from dangerous tasks. From a jobs standpoint, however, companies need fewer people to be equally productive. For instance, Carlton says

the ratio of hourly workers to salaried workers may shift dramatically. His company, which is currently working on its environmental impact study in preparation for mining, plans to use in situ methods, which are far less labor-intensive than traditional forms of mining. As a result, he believes, he will need about 40 hourly workers and 25 salaried workers when his operation begins in about 30 months. (A mine using traditional methods might expect a ratio more along the lines of 115 hourly workers and 35 salaried.) So it's not entirely clear if newer, better technology actually will increase mining job opportunities for women.

On the professional side, the number of women in mining may increase, as more women enter such fields as engineering, geology and computer science. According to Dr. Ashworth, 15 percent of the mining engineering students today are females and about 28 percent of geology students are females. The national average for women in engineering fields is about 19 percent, so the figure for females in geology is higher than normal, while the figure for mining engineering is a few points below the average.

**Profile: Sandy Dorsey of Windsor Coal Company**

Sandy Dorsey is a mining worker who loves her chosen career. One of seven



daughters born to a coal miner, she had initially decided to be a nurse, which she tried for about five years. But nursing wasn't for her. What she really wanted to be was an underground miner.

And she did become one, working the midnight-to-eight shift underground.

She remembers her first day on the job at Shoemaker Mines in 1979, going down the elevator. "I thought, Sandy, you may have bit off more than you can chew this time!" But within weeks, Dorsey says, she was hooked.

"It is a different world down there and reminds me of a little city," says Dorsey. "It's not dark and dingy like everybody thinks. We have rail equipment so you've got transportation; throughout the mine," she says.

Dorsey studied for and earned her West Virginia mine foreman's operator's license and proceeded to obtain her federal certificate as an instructor. A mechanically inclined female who loves to read equipment manuals and fix machines, Dorsey works today as training supervisor for Windsor Coal, where she's worked since 1985 and was promoted to training supervisor in 1988.

For two days a week, she is the fireboss. She does the annual refresher training for the underground, providing an eight-hour comprehensive course on accident prevention, first aid, CPR ventilation and other key topics. Her

other three days are spent conducting safety training, working with state and federal mine inspectors, and working on ergonomic issues.

Dorsey is also an active member of the Mine Rescue team as well as benchman who checks the underground apparatuses. "We use a four-hour unit, and you wear it like a backpack," she says. "It has a complete face shield, in which you breathe pure oxygen and it scrubs out the carbon dioxide."

Dorsey says she wishes the public understood more about mining and recalls a movie she saw several years ago in which a female miner climbed around in an unpleasant environment with rats everywhere. "It's not like that!" she says.

She also is annoyed by people who know nothing about mining speaking out against it. "A lot of times people are out there making decisions, and they've probably never seen a lump of coal or been to a community where that's their livelihood. And they've got that 50-year-old pick and shovel image."

Dorsey loves her job and the people who she works with. She says, "There's a special type of unity and pride.

You're a coal miner first—regardless of whether you're management, union, or non-union."

### **Race and Ethnicity**

Figures provided by the Bureau of Labor Statistics indicate that about 13.4 percent of the "extractive" work force (which includes supervisors, oil well drillers, explosives workers, mining machine operators and other mining occupations) are members of minority groups, including 6.7 percent blacks and 6.7 percent people of Hispanic ongoing. Of this breakdown, 1 out of 10 black workers is female and no Hispanic workers are female. There is nothing to indicate this will change in the near term.

Another development among minorities is occurring with some

Native American groups. An estimated 75 percent of the employees at three BHP mines on Navajo lands in New Mexico are Navajo tribe members, according to an April 12, 1996, Business Wire release. Coal and utility taxation and royalty revenues are also very important to the Navajo Nation, which earned millions in royalty revenues last year from mining companies using their lands. The Navajo Nation, along with BHP Minerals and Arizona Public Service, has formed a task force to study ways to increase revenues and cut costs. Other Native American tribes may form similar partnerships; in fact, 57 Indian Nations from the United States and Canada have formed the Council of Energy Resources Tribes (CERT).

Globalization also will affect minority workers as companies continue to expand into all parts of the world. For instance, individuals who speak more than one language increasingly will be needed in the mining environment, says Jon Langstaff, vice president, human resources, for Hecla Mining Company in Coeur d'Alene, Idaho. Some minorities, such as Hispanics, should benefit. Says Langstaff, "Certainly anyone who is bilingual has a big advantage getting a job."

### **Short on experience**

One problem area that the mining industry is beginning to face is a looming experience shortfall. As previously mentioned, talented young people were deterred from entering mining because of the bust of the early 1980s. This poses a potential problem as older, experienced miners retire and companies search for new workers to replace them. "We haven't suffered too much so far, but down the road we will," says Langstaff, explaining that the Canadians apparently have educated many mining engineers, which helps to meet current need. "I get quite a few resumes from Canada," he says.

But Langstaff is already dealing with

some labor shortfalls. "The one area where we find shortages a lot is in the skills area of electrical and mechanical. You can find plenty of truck drivers and people to drill or blast, but the demand is very great for people with training in journeyman electrical and diesel mechanics and other mechanic skills."

Looking at the succession issue in a different way, Matt Hrebar, associate professor in mining engineering at the Colorado School of Mines in Golden, Colo., says, "I think the people who are in the business now are in a great position. Those 45 year-old guys are not thinking of working until age 70, and I think there will be a lot of openings. Companies are recognizing that and are pretty actively recruiting students for summer jobs, to get a look at them and fill the slots."

He believes salaries will go up for such needed employees. "Just looking at the supply and demand, you can see the shortage of entry-level people and five-year people," says Hrebar.

Carlton says he doesn't believe a degree in mining or geology will be necessary for future mining workers. Instead, he believes mining companies will draw on people with knowledge of computers and other skills. "My belief is that technology is going to drive the work force, rather than it being mineral-specific or occupation-specific. If you can run a computer, it doesn't matter whether you are analyzing broken bones or monkeys, it's your ability to use the machine that counts."

Carlton says people with degrees in chemical engineering, computer technology and other related subjects will be needed. "In the past, people had to know how steep of a slope you could have on your open pit. But today you can computer model it."

Clearly, skillful workers will be in demand, but not all will be college graduates. Says Ashworth, "I think the work force of the future needs to be well-trained and educated. They should be high school graduates in order to operate expensive equipment. And

companies will need to do training." She believes that once a company invests time and money in training a worker, it will try harder to keep that worker on.

Ashworth also hopes that the industry will work together with college educators. "It's important for the industry to know how many students are coming through and to estimate how many they are going to need," she says. "Research working with the university can also help industry solve some of the problems it may have. I think close cooperation between

their operations abroad. Obviously, when mining operations move, so do jobs.

Jon Langstaff of Hecla Mining says a primary concern of the mining industry should be to "keep jobs for people." But that, he says, is not so simple. "There is such a tremendous impact of environmental rules and regulations and laws that we are to the point of saying, it's not worth it to operate in the U.S.; let's take our exploration money and go to Mexico."

Langstaff points as an example to a \$600 million lawsuit filed in March



industry and the universities is essential."

Ashworth sees such a collaboration as an investment in the future, similar to internal research and development programs in which the companies invest.

### **Molders and shapers**

An array of hard-to-predict issues will also directly impact the size and composition of mining's future work force. For instance, the extent of additional environmental regulation and lawmaking is not known, although most trend watchers don't expect any abatement. While environmental impact studies, reclamation and other environmental activities are an important and well established part of mining, extremist activities are causing some companies to move most or all of

against Hecla and four other companies alleging that tailings vanished into rivers and creeks damaging wildlife. The problem, according to Langstaff, is that the situation was created by "transgressions that happened a hundred years ago, when mining started in this district." He says, "The government has filed this huge lawsuit saying that we're responsible from a hundred years ago to, say, thirty years ago, when the practices were changed."

The bottom line, says Langstaff, is this, "In order to provide good jobs—and we do—we just can't continue to fight lawsuits. We're already in Mexico, and I'd say 90 percent of our exploration budget is geared toward Mexico."

Such decisions have nothing to do with the industry's commitment to the

environment. Carlton of Gold & Manganese Resources says, "Historically, there's been an adversarial relationship between the greenies and the mining industry. But we've found within the mining industry some of the truest environmentalists—people who care more about the environment than those who just use it as a political platform."

The globalization of mining (expansion, not simply relocation) is another critically important factor affecting mining workers of the future. Professor Hrebar says some companies that move all or most of their



operations abroad likely will need U.S. engineers on site, and he believes the mining professionals of the future will need to be flexible "in terms of location." Says Hrebar, "Some of the companies will start you here in the U.S. for about three or four years and then say that you will go overseas—that's part of your growth plan with them." As a result, many young men and women professionals can expect to work abroad for several years at least.

Another major factor affecting the industry's work force is the overall

public image of mining, which plays a key role in whether young men and women choose to enter this career field. A 1991 survey conducted by equipment manufacturer Caterpillar, Inc. concluded that initial attitudes about mining range from slightly to very negative. The reason? General lack of understanding about both modern mining techniques and mining's contribution to daily life and the nation's economy.

According to the survey findings, most consumers form their opinions of mining as a result of what they see in movies and TV entertainment shows (not documentaries). With few exceptions, most are completely unaware of reclamation activities.

Companies are struggling to overcome this negative image, and the Caterpillar study found that even though consumers' initial attitudes may be negative, most do not hold strong feelings about mining one way or the other once presented with factual information about current industry practices, most developed a more positive opinion.

Many in the industry recognize that opinions are being shaped as early as the elementary school level and are working to supply educational materials and opportunities accordingly. Sandy

Dorsey, training supervisor at Windsor Coal Company in West Liberty, W.Va., which is owned by American Electric Power (AEP) in Zanesville, Ohio, says one way her company does this is to offer area teachers special three-day workshops which have proven very popular. "We've got waiting lists from these teachers!" she says.

The teachers spend one day at a power plant, one day underground and a third day on the surface. They then return to the classroom and share their knowledge with their students. AEP, like many of its compatriots, also offers puppet shows and videos for elementary school children.

It is clearly essential that mining companies join hands with educators at all levels to improve the industry's image with America's up and coming generation. As competition for skilled workers increases and the skills required by the mining industry become more generalized (computer expertise, language abilities, knowledge of environmental stewardship, negotiating skills, etc.), the industry will be competing against other industries for the same potential workers. Now's the time for mining industry leaders to pull out the stops to ensure that those prospects become job applicants and then employees willing and able to lead mining's dynamic work force into the future.

*Reprinted from the May/June 1996 edition of MiningVoice.*



**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.

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## *The key to safe truck haulage*

*By Mark M. Smith, President, Surface Training Systems*

In recent years the surface mining industry has focused its attention on providing miners with a safer working environment. Great strides have been taken in reducing accidents and in protecting the health and safety of mining personnel. Despite this progress, there are still many areas within the industry that require further attention.

One such area is that of truck haulage. Within this sector, a high number of accidents continue to occur. Expensive equipment is damaged. Insurance premiums rise. Productivity is lost. Worst of all, people continue to die or to be injured. All too often, accidents happen because those involved either did not know how to avoid a hazardous situation, or they simply grew careless.

Each such incident raises critical questions concerning safety and its application in truck haulage. Where

were safe practice procedures lost? Did the breakdown begin with management? Was safety talked about but treated as expendable when production levels were affected? Was the fault a lack of training? Was the training provided effective? Was the fault that of the individual? Did they fail to apply safe methods of operation? Could they have failed to understand these methods? Only by addressing these questions, seriously and honestly, can steps be taken to change the continuing numbers of accidents seen each year. Each statistic is a life. Each life ripples outward and touches other lives.

Because lives are involved, it is time for safety within the truck haulage sector to be given more than mere lip service. Until every person, on every level truly believes that safety and safe procedures are vital, this will not become a reality. Such a positive safety environment can only

be created by changing how safety is perceived and applied. This means the predominate mindset towards safety must change. A new mindset must be created and applied by all. Management must be the first to develop and display this positive mindset if they expect those under their supervision to display it as well. Their positive actions will then become a catalyst in creating this positive mindset throughout their organizations. Only when management sets a positive example will safety regulations and procedures have real, concrete impact.

### *Four steps to creating a positive safety mindset*

To create this predominate mindset four basic steps can be used. Each step is critical and their validity must be believed in by all. Everyone must not only understand them, but must use them, no matter how small the



task. Each individual, from upper management to the truck operators, must make a commitment to this.

### 1. Positive attitude

The first step is positive attitude. Attitude could be defined as a prevalent belief that if certain things are true, then other things must follow. Attitude affects every one and every thing. In mining, positive attitude towards safety requires commitment from everyone.

Management has to set the standard for what is and is not a safe practice. They are the first step in creating a positive attitude towards safety. They are the front line of a positive safety mindset for others. From them this mindset filters downwards. Each individual in succession must do their part. No one can afford to think that some detail of safety is minor enough to be ignored. This is what a positive safety mindset entails. Safety must be approached on all levels with the same degree of commitment.

### 2. Training

The second step in creating a positive mindset towards safety is Training. Training is empowerment. It gives management, supervisors and operators alike, a clear understanding of what is and is not the proper way to operate a haulage truck.

For management, a solid, state-of-the-art training program is critical. Such a program is an asset when defining and maintaining a definite safety mindset. Once training is in place, an on going database of information will exist. This database will allow accurate assessment of the operation's current commitment to safety. It will also help in determining to what extent the safety goals are being applied and met. Such thorough documentation measures the long term results and achievements of safety, and safe practices. It also identifies where strengths and weaknesses exist.

The training of supervisors in proper truck haulage procedures cannot be over stressed. This is because a supervisor cannot make solid, well executed safety decisions for his or her crew if uninformed about what is and is not a safe method of operation. Without such information, they will be unable to gauge accurately the actions of those they supervise. Having a clear understanding of the truck haulage operation will allow them to quickly recognize when a hazardous situation exists or is developing. They will then know what steps they must take to correct and prevent such situations.

Truck operators benefit as well. This state-of-the-art training will give them a clear understanding of the machinery itself. It will enable them to immediately identify safety or operational defects. They can then cease operation at the first sign of trouble, before a hazardous situation has an opportunity to develop. Training also assists operators in reducing damage to their machines. It gives them a thorough understanding of what actions must be avoided and what practices must be employed to prevent damage to their equipment. They will then know how to respond correctly in any given situation. A well-rounded training program must also teach operators the consequences of their actions. They must understand that the choices they make, either positive or negative, affect not only their own lives, but the lives of others.

A solid, state-of-the-art truck haulage training program consists of several factors. Each portion is a tool that will ensure that a clear understanding of truck operation is gained. Such a program should include classroom instruction, simulation, field training sites, measurement of skills and knowledge, and periodic refresher training.

For CLASSROOM INSTRUCTION it is important that the training materials are of the highest quality,

offering consistent, comprehensive, easy to understand information. Graphics and color are needed as well because they highlight the lessons being learned and serve as memory aids. This stimulates the retention of safety and procedural information. Quality materials help the instructors to make the learning process stimulating, not intimidating.

Instructor credibility is critical, and the most effective instructors are knowledgeable, experienced operators as well. Students will have more confidence and respect for an instructor who demonstrates the safety and procedural skills being taught. An instructor who fails to teach by example will not be respected. Thus, it is extremely important that great care be taken when instructors are selected. The success of the training program will depend upon it.

SIMULATION is now an established training practice at some surface operations. These simulators are used to familiarize new operators with the controls and characteristics of a haulage truck prior to actual operation. This reduces the stress levels upon the students while enhancing the learning process. Here the student drivers can afford to make mistakes because the consequences of their actions are not catastrophic. Simulation helps the students develop sound driving habits while learning from their mistakes. This reduces the likelihood of them being repeated during actual driving situations.

The use of dedicated FIELD TRAINING SITES can also play a significant role in well-developed training programs. It is here, away from the hustle and bustle of the active mining areas, that newcomers begin to put the things that they have learned into practice. For the first time the classroom and simulation skills are used on a real machine, in a real life situation. Isolating the site away from the actual production

environment allows the student to refine the things learned without endangering property or other personnel.

MEASUREMENT OF SKILLS AND KNOWLEDGE is crucial in assessing the effectiveness and success of any training program. Without this, there is no way to ensure that drivers fully understand the safety and procedural training that they have received. Also, there would be no way of knowing if they can apply this knowledge in a field production environment.

Written and field examinations provide organizations with the necessary data to determine successful knowledge and skill transfer. Test results will indicate whether additional training is required or if the program itself needs to be improved upon.

Whether a truck operator is relatively new or has many years of experience, all should receive PERIODIC REFRESHER TRAINING.

This serves to reinforce safety procedures and to combat complacency. As in any other job, familiarity can result in carelessness. Refresher training keeps the operators' skills and knowledge levels sharp.

### 3. Accountability

True accountability for the outcome of any truck haulage safety program requires that *each* person takes responsibility for the consequences of their actions. Managers, supervisors, operators, and others must have a clear understanding of what their responsibilities are and for what they will be held accountable. Everyone must understand *precisely* what behaviors must be seen and exhibited as well as what behaviors must not be seen or exhibited. Be specific; banish all generalities.

Clear definition of responsibility is critical if individual accountability is to be reinforced. All need to understand the consequences for meeting or failing to meet these expectations. It must be understood

that accountability applies to everyone. Unless there is a consistent application of the principles of accountability, motivation to operate in the safest manner possible may be lacking. Accountability serves as a safety check.

### 4. Consistency

Another important element in creating a positive safety mindset is consistency. Consistency creates a baseline with which to evaluate safety and operating performance. It enables an operation to take the talents of their workforce and forge them into a safe, cohesive unit. It also means that despite the inconsistencies that arise due to experience levels, personalities, etc., safety will remain the number one priority. If these safety standards are applied inconsistently, credibility will be lost.

Since individuals react in different ways towards safety, an environment conducive to compliance must be created. While the standards must remain firm, be willing to do whatever is necessary to assist all to strive for this constant standard. Only then will your safety program succeed.

These four steps will create a positive safety mindset within any truck haulage program. They will allow an operation to measure their own commitment to safety and to rate how well existing programs are being applied. They give added impetus to the strides already taken to improve truck haulage safety in recent years.

The four steps: positive attitude, training, accountability, and consistency will create a positive safety mindset. They will assist everyone from mine managers to haulage truck operators to become safety experts. If all are such safety experts, then the safety statistics for truck haulage will improve. Lives will be saved; injuries prevented. Safety will then have a positive effect on a countless number of lives. It will ripple outward from those possessing this positive safety

mindset, touching both directly and indirectly, the lives of all they encounter.

No one can be allowed to be exempt from this positive safety mindset. For it to become a reality, the mining industry as a whole must change. Safety and these four steps to creating a positive safety mindset must be given equal attention and commitment. If not, then the entire safety program will be jeopardized.

To accomplish this is challenging and requires positive change. To resist such change means that the industry is satisfied with the status quo; the poor safety attitudes of the past. This is unacceptable, because these attitudes have resulted in the loss of good people. Some have paid with their lives. Others have suffered injury. All were simply trying to make a living for themselves and for their families.

Creating this positive mindset within every truck haulage operation is not an impossibility and can be attained through diligence and effort. Everyone must give safety top priority and complete commitment. Just think, the person (statistic) saved, may be you!

#### *About the author:*

*With over twenty years of experience in the surface mining industry, Mark Smith has trained miners in both the United States and in South America. Seeing a need for improved safety and training programs within the industry, he established Surface Training Systems, a firm that assists mining companies in the development and implementation of safety and technical training programs. These programs focus on educating supervisory and operating personnel to work more safely and productively. Mark holds many different instructor certifications including MSHA and DDI. He is an associate member of both the Holmes Safety Association and Southwest Mine Safety Engineers. Mark is also an executive committee member for the Mining Section of the National Safety Council.*

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## Beyond picks and shovels

*A newer, higher-tech industry creates diverse jobs for workers both in and out of the mining trade.*

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Just a few decades ago, coal and mineral mining was regarded as a dirty, often dangerous job for laborers whose meager skills and education forced them deep into the bowels of the earth to make a living.

As the 21st century approaches, however, the mining industry in the United States has reached a level of sophistication that demands an unprecedented level of training and education among its ranks. In addition, the industry's broadening provides jobs not only for mine workers themselves, but for thousands of workers in a variety of professions—white collar and blue collar—that serve the mining industry. In all, employment in industries that support mining—including manufacturing, engineering, environmental and geological consulting—accounts for an estimated 3 million jobs.

### Miners

The average coal or mineral mining operation employs workers specializing in dozens of diverse trades. Laborers at the surface coal mine include strip shovel operators, mobile and stationary equipment operators, blasters, haul truck drivers, mechanics and electricians. Underground coal mining operations employ longwall machine operators, underground electricians, roof bolters and coal drillers.

Many of these same classifications can be found on the mineral side, as well as kiln operators, diamond drillers, millwrights and baghouse custodians.

"You can't really go to school to be a miner—with the exception of some skilled trades, such as electricians and mechanics," says Jennifer Leinart, geologist and cost

analyst for Western Mine Engineering, a Spokane, Wash.-based cost analysis firm serving the mining industry.

"The skilled trades people are generally the top hourly people in a mine, and you can go to school for that. But most miners start out as laborers and trainees, and they work up to scale. So in other words, it's a standard, on-the-job training approach. They learn how to use the equipment as trainees and then move up."

Mining companies are becoming much more selective about who they hire, says Leinart. "You can't be a dropout and get a job in a mine. You have to have some smarts," she says. "They like people to be skilled in more than one thing. People are cross-training on different pieces of equipment, and therefore becoming more efficient. And the higher the skill level of the laborer, the better the job opportunities and the better the pay."

### Engineers

Mining engineers need to have a firm understanding of how all of the trades previously listed fit together in a mining operation, and a technical and business sense to keep all of them running smoothly, says Ron Brummert, career center director at the Colorado School of Mines, Golden, Colo. Brummert has frequently described the ideal mining engineer as having "an understanding of mining engineering, and then an MBA with a mineral flavor."

The mining engineer should understand not only the extractive aspects of mining, but also have the management skills relative to mineral resource industries, "rather than just a plain, vanilla-flavored MBA," says Brummert. "What we're seeing is the

request for mineral economics graduates to really know global markets and global conditions."

The requirements of the mining engineer are shifting from the operational to the technical, says Paul Chugh, chairman of the department of mining engineering, Southern Illinois University, Carbondale, Ill. "The future mining engineer... needs to know more about mine ventilation," says Chugh. "He needs to know more about ground control. He needs to know more about coal processing and mineral processing. And he needs to know more about the environment."

The mining engineer of the future should also have a firm grasp of manufacturing principles, he adds. "They need to understand automation, controls and the feedback loops. In other words, they have to be more electronic, electrical and computer-oriented. They must have very strong design and engineering skills."

Average salaries reflect the industry's heightened skill levels. Company average annual wages compiled by the U.S. Bureau of Labor Statistics (BLS), miners earn \$41,535 compared to the average \$25,553 earned by other industrial workers.

The average salary for a general manager in a coal mine is \$101,400, according to Western Mine Engineering's 1996 salary, wage and benefits survey. A foreman in a coal mine makes \$53,400. On average, a mine engineer in a coal mine earns \$53,800.

Coal mine employees specializing in the sciences tend to make a little less than their management and engineering counterparts. On average, a coal mine geologist earns \$49,000, while a chemist earns \$47,000, according to *Western Mine Engineering*.

The average salary for a general manager of a metal and mineral mine is \$94,600, according to Western Mine Engineering. A metal and mineral mine foreman makes \$46,200. On average, a metal and mineral mine engineer makes \$44,900.

A chemist metallurgist in a mineral mine makes \$45,700, while a mineral mine geologist makes \$43,400.

### **Safety and environmental**

With federal, state and even local environmental regulations growing more stringent in the past decade, managers and technicians with an environmental background are taking on a more prominent role in the mining industry, says Leinart.

"One of the titles we survey is environmental technician/environmental manager," she says. "You would never have seen that title 10 years ago at most mines. Now, that's a pretty key person. We're also seeing more permit managers—the people who make sure that the workers have sprayed the dust suppressant on the roads, and make sure that the operation is not putting out any effluent from its tailing disposal area, and properly managing reclamation procedures."

On average, an environmental coordinator employed by a coal mining operation brings home \$558,500 a year, while an environmental technician in the same operation brings home \$37,600, according to the Western Mine Engineering survey. An environmental coordinator at a metal and mineral mine makes an average of \$51,800. Environmental technicians in the same setting come in a good bit lower at \$32,200.

Part of the environmental compliance game for a mine operation includes reclamation, a process that requires the attention of environmental managers on a continuing basis, says Leinart.

"Reclamation is not something that just happens when the mine closes down," she says. "Usually these things are ongoing. As you're finishing one waste area, you cover it, and you go ahead and start seeding and planting. [Mining projects] are planned with reclamation in mind. So they hire these guys right off the bat."

### **Other disciplines**

With the regulatory backup—environmental and otherwise—looming large, attorneys have taken on a more prominent role in the mining business in recent decades. In the mining industry, as in every part of corporate America, attorneys fall into one of two general categories: in-house counsel, who are employed by the mining company full time, and attorneys working for private law firms who are kept on retainer.

In-house counsel are basically all-purpose lawyers who handle a range of legal issues, including corporate law, contract law or whatever other legal matters need to be addressed to keep the mining company in compliance with the law. The duties of in-house counsel are by no means limited to legal issues specific to the mining industry. They could include the same legal matters that any corporation in any industry faces. Lawyers kept on retainer, however, are more likely to be specialists in some area of the law relative to the mining industry.

"When you're putting together your environmental impact statement for a new mine or an extension of an existing mine, that's when you get involved with the permit specialists and the environmental attorneys—as well as the biologists and the wildlife specialists, the fishery specialists and the geologists," says Leinart. "But these are typically consultants... and they are all on contract."

### **Beyond the mine**

With mining becoming a more high-tech industry, computer

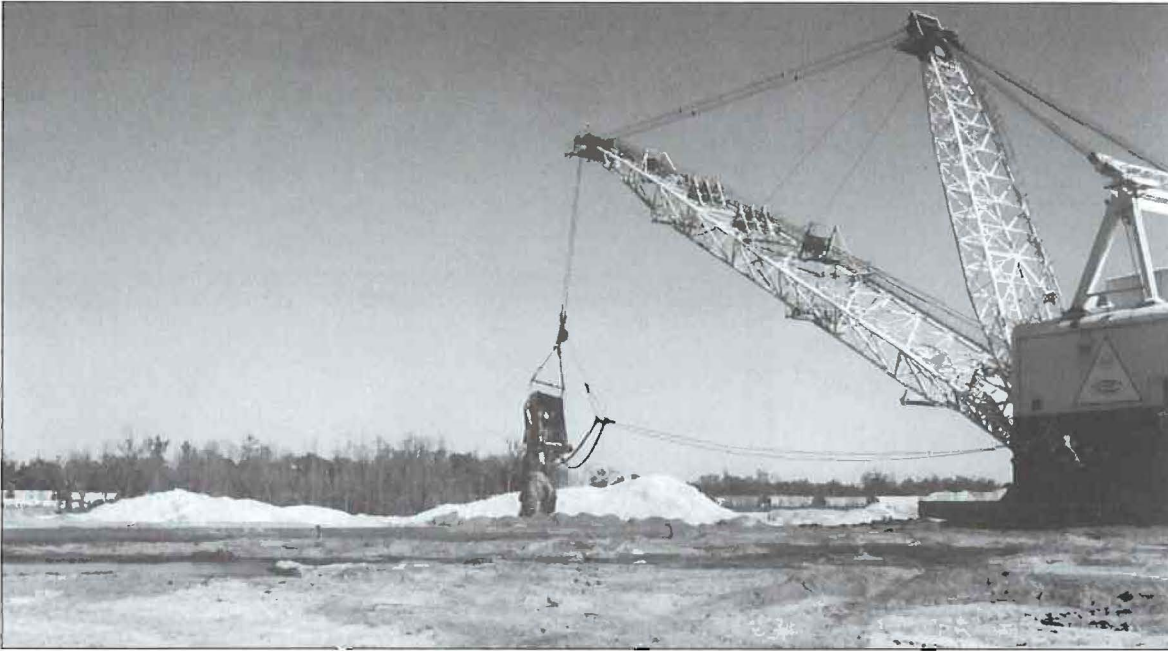
programmers and technicians are likely to play a more prominent role in the future of mining, says Chugh.

"The use of computer software is changing the industry quite a bit," he says. "What could be done in a week's time 10 years ago can be done in less than an hour today. The transfer of information is so efficient now that I think we can achieve a whole lot more in a very short period of time. So we have time left over to do what we really should be doing, and that is technical thinking, planning and design."

Thousands of workers who may never see the inside of a mine make their living building the equipment used to extract coal and minerals from the ground. Nearly 13,000 workers are employed in the United States each year to build equipment used in the mining industry, according to the U.S. Commerce Department's 1992 Census of Manufacturers. Among the mining-related machinery and equipment listed in the census are drills and related parts and equipment; crushing, pulverizing and screening machinery and conveyors.

Once the material is out of the ground, rail drivers, barge operators and truck drivers go to work to ship the material from the mine operation to the customer. Mining products represent about 3 out of every 5 tons of revenue freight carried by the railroads, and approximately one-half of all commodity tonnage handled by barge lines operating on the nation's waterways, according to the National Mining Association (NMA). Much of the tonnage produced by the mine operators is distributed intermodally, with trucks furnishing relatively short-haul transportation services from the mines, connecting with railroad tipples and barge terminals for joint truck/rail or truck/barge shipments.

Coal is the most significant user of rail transportation in the United States, with more than 6.5 million carloads of coal moved domestically



by rail in 1994, says NMA. The rail system also plays an important role in transporting mineral ore to processing plants, concentrate to smelters, refined metal to fabricators and finished product to market. Coal is one of the most significant commodity users of water transport, but metallic and industrial minerals make use of barge and ship transport as well. In 1994, 35 million tons of coal and 70.1 million tons of iron ore were shipped along the Great Lakes.

### Outlook

While the diversity of jobs in the mining industry has increased, the Bureau of Labor Statistics (BLS) estimates a decrease in the number of wage and salary jobs directly in the mining industry (metal, nonmetallic mineral and coal mining)—from 281,000 in 1992 to 261,000 in 2005. Other sources predict decreases of up to 62,000 jobs.

The coal mining industry by itself is expected to have an employment decline of 36,000 jobs, says BLS, although the output for coal mining is expected to show continued strong growth." with a 3.1 percent average annual rate of increase from 1992

through 2005, in part because of continued strong foreign demand for exported U.S. coal.

The metal and nonmetallic minerals mining industries are expected to have a combined 17,000 job increase in wage and salary employment, slightly offsetting the decline in the coal industry. The output measures for the metal and nonmetallic minerals industries are expected to rise at annual average rates of 2.3 and 2.2 percent, respectively, largely as a result of increased demand arising from healthy manufacturing output growth.

The decline in mining jobs is a result of economics and technology, says Leinart.

"The first [reason], of course, is that we're doing less mining in this country," she says. "The second reason is that mines contain a finite amount of resources, and they eventually close down, and because of the regulatory atmosphere in this country right now, it takes much longer to start a mine up. So mines are not being replaced as they're being closed down. The third reason is mechanization. We've become more efficient, and each miner is mining more tons of material per

man-hour than they were mining several decades ago. So there are a combination of factors at play here."

It is these same forces that are shaping the future of mining, and creating a cleaner, more efficient image for the mining industry of the 21st century.

"There's much more focus on the economic and the financial end of things," says Brummert. "Certainly, there's the influence of technology and computerization, and our ability to incorporate these types of tools now. There are investment decisions, there're economic analyses, and those kinds of dimensions. We're far beyond the old image of grabbing a pick and shovel and heading for the hills."

Today's miners are more likely to grab a laptop computer and cellular phone, hop in a helicopter and head for the Arctic Circle. And in the future? Only time and new technologies—made possible by the products of mining—will tell.

*Reprinted from the May/June 1996 edition of MiningVoice.*

## Geologic conditions affecting drilling and blasting

By Robert E. Morgan

The goal of blasting is the cost-efficient production of shot rock with the desired fragmentation and the least potential for adverse impact on adjoining property owners. A successful blast is the culmination of careful consideration, planning, and execution of a blast design which takes into account the geology of the rock formation that may include:

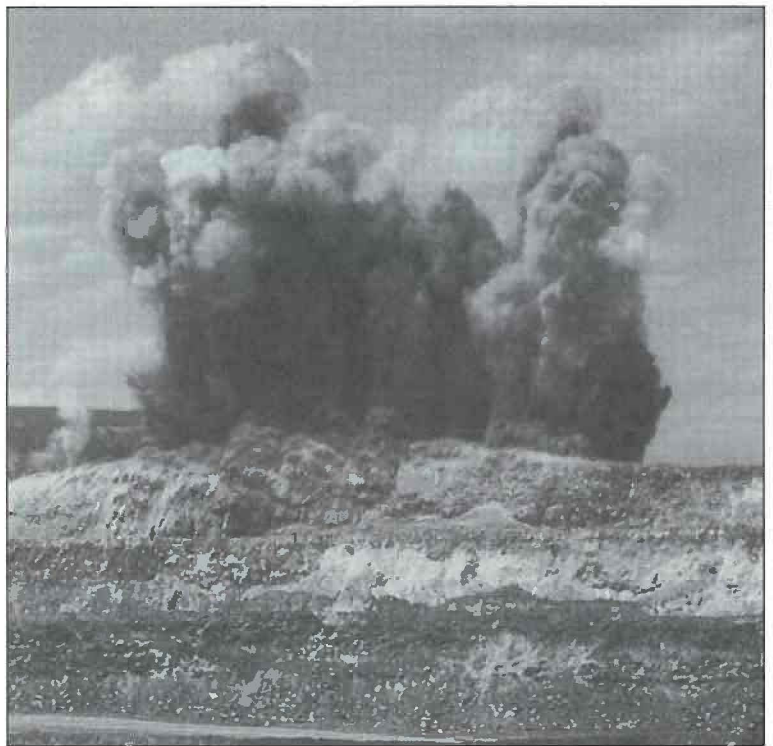
- dip/strike
- Jointing
- caves/cavities
- water-bearing strata
- faults

Failure to address these geologic conditions by the blaster in charge can result in undesirable effects of the blast such as flyrock, high levels of air blast, or poor fragmentation of shot rock.

If blasting rock that **dips** toward or away from the open pit, post-blast sluffing or over-hanging rock may result. These hazards can usually be eliminated by changing the direction of blasting/pit development to be consistent with the **strike**, which is perpendicular to the direction of the dip.

**Jointing** in the stratum/strata can create problems in both the drilling and blasting activities. There is often an increased problem of drill hangup when drilling parallel to joint sets. In addition, **FLYROCK** usually occurs if the normal powder factor is not reduced in the highly-fractured area.

**Caves and cavities** in the rock to be drilled and blasted can result in over-loading with explosives if not detected during the drilling



process. Certain rock formations, like dolomite and other carbonates, are often characterized by these or other anomalies such as folds, anticlines or synclines.

**Water-bearing stratum** (aquifers) can increase the risk of changes in borehole alignment or blockage during freeze-and-thaw weather, and can significantly reduce the effectiveness of ANFO explosives if not protected by plastic sleeving.

**Faults** can result in displacement of rock along a fracture which can disrupt drilling, loading, and detonation activities. Mine development plans should clearly identify geologic faults in order that suitable ground control measures

can be employed prior to the start of any blasting or excavation activities.

Drillers, blasters, and mine supervisors can improve both safety and production costs by implementing drilling and blasting techniques that are compatible with the geology of their mine site.

*Submitted by Robert E. Morgan  
BLS: Management of Mining Sciences  
Mary Washington College*

# WINTER ALERT

**October  
through  
March  
1996-  
1997**



***You'll always  
score  
when you  
take extra care with:***

- ***Ventilation***
- ***Mine examinations***
- ***Control of ignition sources***
- ***Rock dusting***

U.S. Department of Labor — Robert B. Reich, Secretary  
Mine Safety and Health Administration — J. Davitt McAteer, Assistant Secretary



## Labor Secretary calls for an end to silicosis

Thursday, October 31, 1996—A foundry worker from Michigan and a miner from Kentucky and their families are just a few of today's victims of the age-old problem of silicosis.

Secretary of Labor Robert B. Reich announced today the start of a national public education campaign, *If It's Silica, It's Not Just Dust*, to prevent silicosis—a disabling, sometimes fatal, lung disease caused by overexposure to silica dust.

The Labor Department is launching the silicosis prevention effort jointly with the American Lung Association and the National Institute for Occupational Safety and Health (NIOSH) in the U.S. Department of Health and Human Services.

“More than 1 million workers across the country are exposed to silica dust on the job,” said Reich, “and 100,000 of them are at a high risk of developing silicosis. Even though this disease is 100 percent preventable, recent studies suggest that the battle against silicosis has not yet been won.”

“This silicosis prevention effort is a partnership that will save lives and significant human and economic costs,” said Secretary of Health and Human Services Donna E. Shalala.

Each year, more than 250 American workers die with silicosis. Those who remove paint and rust from buildings, bridges, tanks and other surfaces; clean foundry castings; mine through rock; crush stone or work with clay; etch or frost glass; and work in construction are among those at risk of overexposure to crystalline silica.

Inhalation of crystalline silica, the second most common mineral in the earth's crust, can lead to chronic, accelerated or acute silicosis and is

associated with bronchitis and tuberculosis. Some studies also indicate an association with lung cancer. The earliest recorded cases of silicosis date back to the first century A.D.

“Sixty years ago, labor secretary Frances Perkins launched a nationwide effort to tackle the problem of silicosis,” said Reich. “I am determined to finish the job she started.”

Beginning tomorrow, workers and employers can get a package of free materials on how to prevent silicosis by calling the NIOSH toll-free telephone information service (1-800-35-NIOSH). The package contains a tip sheet of ideas for preventing silicosis, a guide for working safely with silica, and stickers for hard hats to remind workers that, if it's silica, it's not just dust. Spanish language versions also will be available soon.

Department of Labor staff will distribute silica materials when they inspect mines, construction sites, and other affected industries. NIOSH, the agency that researches and recommends solutions to workplace hazards, will staff the 800 number and provide technical information to callers.

“We are continuing to make significant progress in fighting this disease. But in 1996, there is no reason at all for any workers to suffer from silicosis,” said Reich. “When word gets out to all workers and employers on how to control silica dust, lives will be saved.”

Joining Reich in today's announcement were silicosis victims and their families who came to Washington to tell their stories. They included:

- J.T. Knuckles, a 56-year old foundry worker from Saginaw,

Michigan, now disabled from silicosis.

- Charlene and Kimberly Howard, the wife and daughter of a rock driller from Hulen, Kentucky, who died of silicosis at the age of 46.

Alfred Munzer, M.D., past president and volunteer spokesman for the American Lung Association, described some of the most serious effects of being overexposed to silica dust. “Silicosis is an insidious, debilitating lung disease that robs people of their breath and eventually limits their mobility and makes them dependent on supplemental oxygen,” said Munzer. “Cigarette smoking only aggravates the effects of silica dust and worsens a patient's condition.”

Margaret Seminarian head of health and safety for the AFL-CIO, lent organized labor's support to the effort: “This is finally the time to say, ‘Stop!’ to silicosis.”

Two companies committed to preventing silicosis at their worksites offered support to silicosis prevention efforts. “Our company is committed to making the capital investment necessary to eliminate silicosis. We see this campaign as a perfect example of where government and industry, working together, can solve a major health issue facing the American worker,” said Kevin Crawford, chair of the National Industrial Sand Association, and President and CEO of Unimin Corporation, the nation's leading producer of industrial sand.

“Our company is pleased to join in this effort to prevent silicosis, and we believe other companies in our industry can and will share in our commitment,” said Donald M. James, President and CEO of Vulcan Materials Co., the nation's largest producer of construction aggregates.



Some tips for preventing silicosis include:

- Monitor dust levels in the air and take corrective action if needed.
- Install and maintain engineering controls to reduce silica dust.
- Use water hoses, vacuums, or wet-sweeping, rather than blowing dust with compressed air or dry sweeping.

• Train workers about health effects of silica dust and good work practices that reduce dust.

As a part of the ongoing campaign to end silicosis, there will be a national conference in March 1997 in Washington, D.C., focusing on the best practices to reduce dust and prevent silicosis.

From a press release by the Mine Safety and Health Administration's Office of Public Affairs  
Document no. USDL: 96-455, For further information contact: Amy Louviere at (703) 235-1452.

## Preventing silicosis

### What is silicosis?

Silicosis is a disabling, nonreversible and sometimes fatal lung disease caused by overexposure to respirable crystalline silica. Silica is the second most common mineral in the earth's crust and is a major component of sand, rock, and mineral ores.

Overexposure to dust that contains microscopic particles of crystalline silica can cause scar tissue to form in the lungs, which reduces the lungs' ability to extract oxygen from the air we breathe. Typical sand found at the beach does not pose a silicosis threat.

More than 1 million U.S. workers are exposed to crystalline silica. Each year, more than 250 American workers die with silicosis. There is no cure for the disease, but it is 100 percent preventable if employers, workers, and health professionals work together to reduce exposures.

In addition to silicosis, inhalation of crystalline silica particles has been associated with other diseases, such as bronchitis and tuberculosis. Some studies also indicate an association with lung cancer.

### Who is at risk?

Working in any dusty environment where crystalline silica is present potentially can increase a person's chances of getting silicosis. If a number of workers are working in a dusty environment and one is diagnosed with the silicosis, the others should be examined to see if they might also be developing silicosis.

Some examples of the industries and activities that pose the greatest potential risk for worker exposure include:

- construction (sandblasting, rock drilling, masonry work, jack hammering, tunneling)
- mining (cutting or drilling through sandstone and granite)
- foundry work (grinding, moldings, shakeout, core room), ceramics, clay, and pottery manufacturing of soaps and detergents
- stone cutting (sawing, abrasive blasting, chipping, grinding)
- glass manufacturing
- agriculture (dusty conditions from disturbing the soil, such as plowing or harvesting)
- shipbuilding (abrasive blasting)
- railroad (setting and laying track)
- manufacturing and use of abrasives.

More than 100,000 workers in the United States encounter high-risk, silica exposures through sandblasting, rock drilling, and mining. Workers who remove paint and rust from buildings, bridges, tanks, and other surfaces; clean foundry castings; work with stone or clay; etch or frost glass; and work in construction are at risk of overexposure to crystalline silica.

### What are the types, symptoms, and complications of silicosis?

There are three types of silicosis, depending upon the airborne concentration of crystalline silica to which a worker has been exposed:

**Chronic silicosis** usually occurs after 10 or more years of overexposure.

**Accelerated silicosis** results from higher exposures and develops over 5-10 years.

**Acute silicosis** occurs where exposures are the highest and can cause symptoms to develop within a few weeks or up to 5 years.

Chronic silicosis, the most common form of the disease, may go undetected for years in the early stages; in fact, a chest X-ray may not reveal an abnormality until after 15 or 20 years of exposure. The body's ability to fight infections may be overwhelmed by silica dust in the lungs, making workers more susceptible to certain illnesses, such as tuberculosis. As a result, workers may exhibit one or more of the following symptoms:

- shortness of breath following physical exertion
- severe cough
- fatigue
- loss of appetite
- chest pains
- fever

### How can workers determine if they have silicosis?

A medical examination that includes a complete work history and a chest X-ray and lung function test is the only sure way to determine if a person has silicosis. Workers who believe they are overexposed to silica dust should visit a doctor who knows about lung diseases. The National Institute for Occupational

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Safety and Health (NIOSH) recommends that medical examinations occur before job placement or upon entering a trade, and at least every 3 years thereafter.

## **How can silicosis be prevented?**

Beginning tomorrow, workers and employers will be able to get a package

of free materials on how to prevent silicosis by calling a toll-free telephone information service operated by NIOSH in the U.S. Department of Health and Human Services (1-800-35-*NIOSH*; select option 2, then option 5). The package contains a tip sheet of ideas for preventing silicosis, a guide for working safely with silica, and stickers for hard hats to remind workers that, if

*it's silica, it's not just dust.*

Spanish-language versions of materials also will be available soon.

Department of Labor staff will distribute silica materials when they inspect mines, construction sites, and other affected industries.

*Source: U.S. Department of Labor*

## **Accident report...**

# **Are you on guard?**

Although some devices seem foolproof—they're not! Sometimes when a device or a machine seems "foolproof", we tend to let our guard down. That's when accidents happen.

The accident scenario that follows involved a machine equipped with a built in safety guard.

A worker was using a drill press to drill holes in a 1/4-inch steel slat bar when suddenly and violently his left hand was jerked into the area of the drill bit and up its rotating shaft, pinching his glove and fingers in the drill shaft.

The worker lost two of his finger tips in the accident.

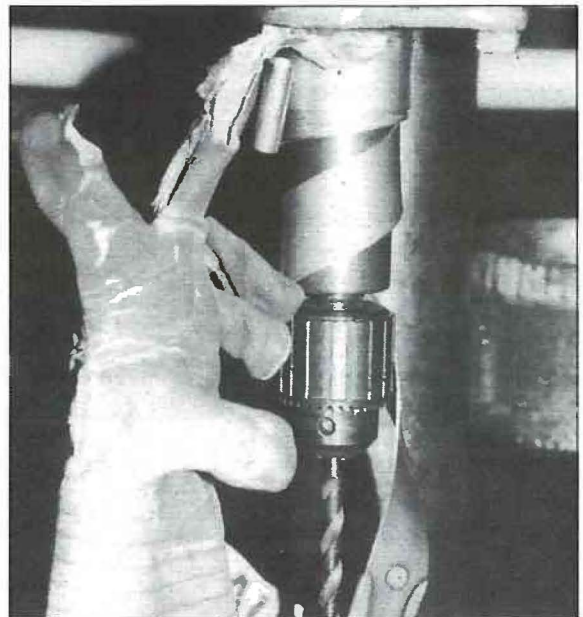
The drill press the worker was using had both a power switch, and a foot-pedal power mechanism. When the power is on, the machine will not operate unless the foot pedal is stepped on. In this instance, the worker was operating the machine and had taken his foot off the pedal. The drill automatically stopped drilling. The worker then reached over to get another tool, and extending himself as he did, he inadvertently stepped on the pedal and automatically started the drill. Because he was still holding onto the quarter-inch metal slat, the force of the drill swung the slat around pulling his glove and hand all the

way up the shaft, pinching his fingers.

The ensuing investigation uncovered that the foot pedal activator (similar to that of a car gas pedal) could easily be activated by anyone walking in the area as the pedal was openly exposed. As a result a foot cover was put over the pedal, restricting the inadvertent start-up of the machine.

The safety committee did a complete inventory of all similar types of start devices, and recommended controls be put in place where needed. The procedure for operation of the drill press has been revised to include a written standard to ensure the operator shuts off the machine at the power switch upon completion of their work.

On a positive note—the injury could have been much worse had the worker not been wearing the



required personal protective equipment.

It is important for workers to remember that safety devices are not infallible, and from time to time, a review of their operation may be in order to assess if they're actually doing what they're intended to do.

*Reprinted from the July/August 1996 issue of the Ontario [Canada] Natural Resources Safety Association's Health & Safety RESOURCE.*

**A worker's glove and fingers were pinched in the drill shaft. Could this happen at your workplace? Are you on guard?**

## ***Southeastern Missouri Mine Rescue Association held 14th annual mine rescue contest***

The University of Missouri and the Missouri Mine Rescue Associations' annual mine rescue contest was held on October 11 & 12th at Rolla, Mo. The Southeastern Missouri Mine Rescue Association sponsored the program.

The contest included a field problem, separate first aid problem, bench test, 25-question written test and 10-question written gas test. An Awards Banquet was held on Friday evening. Trophies were handed out for the Field Problem, Bench Contest, and First Aid Contest.

Eight teams participated in the Field Problem. Teams entered the mine looking for a three-member blasting crew. Previously two foremen had entered the mine to see why the blasting crew had not come out of the mine after a blast was made. There were a total of 5 men missing. An air blast had occurred, prior to the foremen entering the mine, disabling the main fan. Later it was determined that the air blast was caused by a fall of ground in the main ventilation drift cutting off ventilation to the back of the mine.

Exploration continued in the 1-, 2-, and 3-crosscuts (X-cut) without any contact with the missing miners. In entering the hanging wall drift past 3-crosscut the two foremen were found dead. One was facing the shaft lying face down in ankle deep water. The other was found facing the back of the mine lying on the mine floor also dead. Neither had a mark on them. Gas checks for O<sup>2</sup> (oxygen), CO (carbon monoxide), NO<sup>2</sup> (nitrous oxide), and CH<sup>4</sup> (methane) indicated the air was good. Teams that tested for additional gasses found gasses that indicated 0.00% SO<sup>2</sup> (sulfur

dioxide), 0.00% NH<sup>3</sup> (ammonia) and 2,000 ppm of H<sup>2</sup>S (hydrogen sulfide), one of the deadliest gasses known to man.

A blasted round was found in the face of the footwall drift past 5 X-cut. Water was also noted dripping from the roof in the area of the blast. A barricade was found in the face of the footwall drift past 5 X-cut. No answer was received when the team beat on the barricade. Two of the powdermen were found lying dead in the footwall drift at 3 X-cut. It was then assumed that the third powderman was in the barricaded area.

Test for gas indicated no change in the amount of H<sup>2</sup>S in front of the barricade. Ventilation changes were made and the main fan, which had been repaired, was turned on—clearing the mine of any gas. The barricade was opened and the 3rd powderman was found, treated, and removed to the surface.

The winners were as follows:

**First place**, The **Doe Run Co.** of Viburnum, Mo. Team Captain: **Mark Nations**.

**Second place** was **Westinghouse Electric Corp.** (WIPP) of Carlsbad, NM. Team Captain: **Robert Rodes**.

**Third place** was **Asarco Inc.-West** of Fork Mine Bunker, Mo. Team Captain: **Kenneth McCabe**.

**Fourth place** was **Asarco Inc.** of Sweetwater Mine Bunker, Mo. Team Captain: **Gary Hensry**.

**Fifth Place** was **Pea Ridge Iron Ore Co.** of Sullivan, Mo. Team Captain: **Dan G. King**.

Total discounts ranged from a low of 38 to a high of 175.

The winner of the Benchmans contest was Joe Baca of Westinghouse

Electric Team (WIPP).

Second place went to Vince Meralufft of Asarco Inc., Sweetwater Mine.

The First Aid Contest was won by the team from Penoles, the city of Terreon, in the state of Coah, Mexico; Team captain: David Jimenez of Zacatecas, Mexico. Second place went to the Westinghouse Electric Team (WIPP) Team Captain: Mitch Carter.

The Penoles Corporate Safety Director: engineer Abel Fernandez Tijerin accompanied the team from Mexico to Rolla, Mo. A total of 12 team members including two doctors were on hand to take care of any unexpected medical problems. The participating team was the winner of the 15-team contest held in Frisnello, Mexico last March [see *HSA Bulletin*, July '96, p. 23].

Many thanks to Gilbert Miera, Deputy New Mexico State Mine Inspector for assisting the Mexican team in traveling to Missouri and back to El Paso, Texas. Gilbert and Fred Saucedo, MSHA Inspector from Albuquerque, NM, translated the mine rescue program and all related documents into Spanish.

Plans are underway to have a second contest in Frisnello, Mexico again this March. Three Teams from the United States will be invited to participate. Long range plans are to establish an International contest between Australia, Canada, Mexico and the United States.

*Submitted by:*  
Whitey Jacobson, E&T Specialist,  
MSHA South Central District Office,  
Dallas, TX

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## Test your safety knowledge

1. Slips and falls are the leading cause of death in the workplace. How many fatalities do they cause each year in the United States?

- A. 25
- B. 100
- C. 500
- D. 1,500

2. Slips and falls are also responsible for a great number of disabling injuries in the workplace. How many?

- A. 118,000
- B. 291,000
- C. 564,000
- D. 1,311,000

3. What is the cost to business, in terms of annual lost work time, of slips and falls?

- A. 500,000 days
- B. 2,000,000 days
- C. 6,500,000 days
- D. 11,000,000 days

4. On industrial premises, where do most slips and falls occur?

- A. Dockyards
- B. Loading platforms
- C. Warehouses
- D. Construction sites

5. What group comprises the majority of victims of fatal falls?

- A. Management and technical support staff
- B. Production, craft and repair personnel
- C. Operators, fabricators and laborers

6. What is the most prevalent hazard in the work place?

- A. Grease
- B. Water
- C. Airborne particles
- D. Moving machinery

7. What is the next most common contaminant in the workplace?

- A. Food crumbs

- B. Discarded tools
- C. Chemicals
- D. Dust

8. Which of these is also a likely source of workplace accidents?

- A. Powder or granular dust
- B. Food or food byproducts
- C. Animal wastes
- D. All of the above

9. What is the most effective floor product for removing the causes of slips and falls in a workplace?

- A. Diligent mopping
- B. Application of an epoxy coating
- C. Vacuum cleaning
- D. Sand-in-paint coating

10. Are all industrial workplace surfaces the same?

- A. Yes
- B. No

### ANSWERS:

1:D. This is a conservative estimate according to the OSHA Safety Handbook.

2:C. According to the National Safety Council, 17.1 % of all disabling injuries in industry are caused by falls.

3:D. According to the National Safety Council, of the 65 million total days lost because of disabling injuries, 11,115,000 were due to slips and falls.

4:D. The Census of Fatal Occupational Injuries calculates that 38% of industry's fatal falls occur at construction sites.

5:B. The Census of Fatal Occupational Injuries reports 262 fatalities in falls by craft workers, 157 by operations personnel and 90 by executives.

6:B. Water creates a hydroplaning effect that causes skidding, slipping, falling, and often severe injuries. Water can be present throughout the workplace, including any areas that are hosed down or wet cleaned; outside loading docks that are exposed to rain; food processing areas that utilize water on their lines; and areas where company vehicles are washed.

7:C. Often present in chemical transfer areas or used throughout the facility to clean certain areas, common chemicals include oil, grease and transmission fluids.

8:D. Powder or granular dust, often in the form of sawdust, is especially prevalent in food processing plants where flour, cornstarch or powdered ingredients are used during processing. They are extremely slippery. In addition, in meat processing plants, animal fat and innards are often found throughout the workplace. Anywhere that syrups, splashing liquids or animal byproducts are present is almost certain to have poor traction and present a hazard to employees.

9:B. Only a high technology epoxy coating system, focused on functionality and effectiveness, can eliminate contaminants. Such a system creates a distinctive profile of peaks and valleys when applied to any surface. Contaminants will flow into the valleys, leaving the high traction peaks exposed.

10:B. There are four conditions common to the industrial environment:  
1. Areas with heavy pedestrian or light rolling traffic.  
2. Surfaces exposed to heavy rolling equipment.  
3. Environments sensitive to odors and requiring low ventilation.  
4. Areas with low or no lighting .

### How did you do?

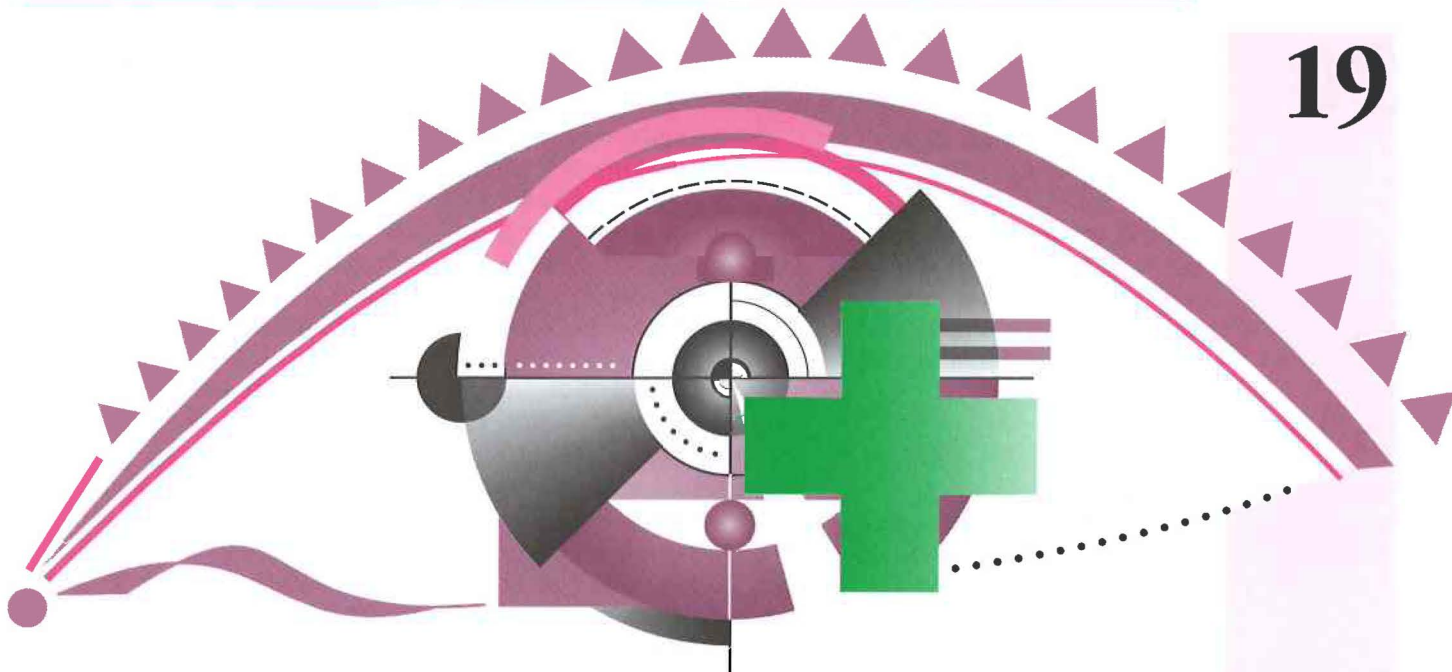
If you answered 8 or more questions correctly, you are an all-star safety manager. You probably use a full complement of the best MRO products.

If you answered 5 to 7 questions correctly, you are running a risk of not protecting yourself.

If you answered 0 to 4 questions correctly, you must take a closer look at your plant because something dangerous is liable to happen.

For more information about how to maintain a safer industrial environment, contact Fel-Pro Chemical Products, 3412 W. Touhy Ave., Lincolnwood, IL 60645, 800/992-9799

Reprinted from the Volume 19, No. 7 edition of the November 1996 issue of Industrial Hygiene News.



## *Safety and innovation— a successful formula*

by Gary D. Jessey, Editor Acquire's *COAL Today*

COAL TODAY was invited to tour a deep mine in southeastern Kentucky that boasts 2-1/2 years without a lost-time accident and a production rate of 1.66 million raw tons per year from two sections, one of which had been in operation ten months.

The Darby Fork Mine in Holmes Mill, Kentucky is controlled by Lone Mountain Processing, an Arch Mineral company.

Mine manager Gaither Frazier and superintendent John A. Richardson are understandably happy about their safety record. Both the Darby Fork Mine and its sister mine, the Huff Creek Mine, tied for best underground safety record and the President's award from Arch Minerals. Their processing plant in St. Charles, Virginia received the surface safety award.

COAL TODAY asked how this was accomplished.

"We hand-pick our people," said Frazier. He continued by saying that the prospective employee has to have

a minimum of five years experience and must take a test that ensures they can safely and efficiently operate at least three different pieces of mining equipment. Richardson commented, "We've got the best workforce I've ever worked with."

Indeed, of the 75 employees at Darby Fork, over a third possess mine foreman papers. The company also has 21 EMTs. Many of the hourly employees were once superintendents, managers, or foremen. "When I ask any one of them to do a job," said Richardson, "I don't have to go into detail to explain how to do it. They know how, and they do it right."

Darby Fork operates two Joy continuous miner sections and is opening up a third section the end of March. Four battery coal haulers are assigned to each section. Each hauler has three sets of batteries, hence, at least three cars are operating at all times. Darby Fork has a 40' cut plan instead of the normal 20'. They use a

remote-controlled miner with scrubber.

Going underground with Richardson in a Johnson Industries battery mantrip, *COAL TODAY* noticed the good appearance of the mine—well rock dusted and ventilated. It's a real showpiece. As soon as the miner left a heading, the roof bolter trammed in, bolted the top and the scoop operator followed to clean up the loose coal on the bottom. Darby Fork mainly uses 5/8" steel roof bolts with quickset (seven second) glue. "There's no need to come back and re-torque the bolts," said Frazier. "It's quicker and works better for our operation."

The Darby seam varies from 48" to 9', the thinner material having less reject. The mine has contracts with Georgia Power and Weyerhaeuser and also selling on the spot market. They operated at 98% availability on the continuous miners and better than 99% on the well maintained beltline. The day before *COAL TODAY* visited,

two sections drove just under 300' per shift each producing 262 truckloads or 9,212 tons. The trucks travel for only a half mile on the two-lane highway right in front of the mine before turning off onto a private haul road that goes six miles over Little Black Mountain to St. Charles, Virginia where the processing plant is located.

But trucking coal from the two mines is in its last days.

Why?

Both the Darby Fork Mine and the Huff Creek Mine are in the process of making a conveyor system to ship their coal right from the mine to the plant—not only up the mountain, but *through* it.

Although this idea is not new (albeit rare), it will save \$3 per ton haulage and will take about three years to recoup the investment. It is expected to begin operation this fall.

Interestingly enough, the Huff Creek Mine, operating in the Kellioka seam, uses a continuous haulage system—this seam is less variable.

The trucks from the Huff Creek Mine travel about 1-1/4 miles on the main highway.

The two mines, owned by the same parent company, Arch Minerals, are in the process of “stacking pillars.” The Huff Creek Mine is operating underneath the Darby Fork Mine. While this mining method is usually near the top of a mountain, the two mines have about 2,000 feet of overburden above them. Both seams are engineered to match, that is, the coal blocks of the Huff Creek Mine match exactly the coal blocks of the Darby Fork Mine. The Darby Fork Mine advances before the lower seam. The only problem so far has been in the area where the Darby Fork seam had been pillared. As the Huff Creek Mine advanced, they encountered roof problems at the barriers of the pillared area. Cable bolts were used at Huff Creek to secure the top.

Darby Fork is only 400' from the outside where the new 48" conveyor system will slope upward out of the

mine. The Huff Creek Mine conveyor system will converge with it, cross the road and make its way over and through the mountain to the processing plant. To accomplish this, Arch purchased the Millers Cove property across the road to gain direct access to the N & S Railroad loadout in Virginia. Both mines now send 3.4 million raw tons a year to the prep plant (Darby Fork: 4.9 clean tons per man-hour; Huff: 4.6 clean tons per man-hour). Lone Mountain Processing will belt coal 17,000 feet over and through the mountain to the plant.

Although the mine maps give production projections into the year 2000, Frazier said, “We have fifteen years of reserves for the three sections we plan to mine in this area.”

Thanks to both Gaither Frazier and John A. Richardson for an enjoyable and educational tour of a safe and successful mine.

*Reprinted from the April 1996 issue of Acquire's Coal Today.*

## JAHSA to present scholarships

The second annual Joseph A. Holmes Safety Association Scholarships will be presented at the National Council Meeting in Las Vegas, Nevada on July 10, 1997. The Joseph A. Holmes Safety Association endeavors to promote health and safety within the mining industry. The Association believes that providing financial aid to students in the pursuit of education related to mining safety and health will result in safer mines and healthier environments within the mining industry.

This scholarship program shall be open to persons currently employed in the mining industry, safety and health fields, high school seniors, or college students who meet the

application requirements. **The closing date for submitting applications is January 15, 1997.** All applications should be sent to the Chairperson of the Scholarship Committee, P.O. Box 2253, Meriden, CT 06450.

For additional information or to request a scholarship application contact: Cheryl Ann Suzio, Chairperson, Scholarship Committee, P.O. Box 2253, Meriden, CT 06450. Telephone: (203) 237-8421. Information and applications are available from the following committee members:

**Sam Vancil**, Illinois Department of Natural Resources, 502 E. Main Street, Benton, IL 62812  
Telephone: (618) 439-9111

**Harry Tuggle**, United Steelworkers of America, 5 Gateway Center, Pittsburgh, PA 15222  
Telephone: (412) 562-2587

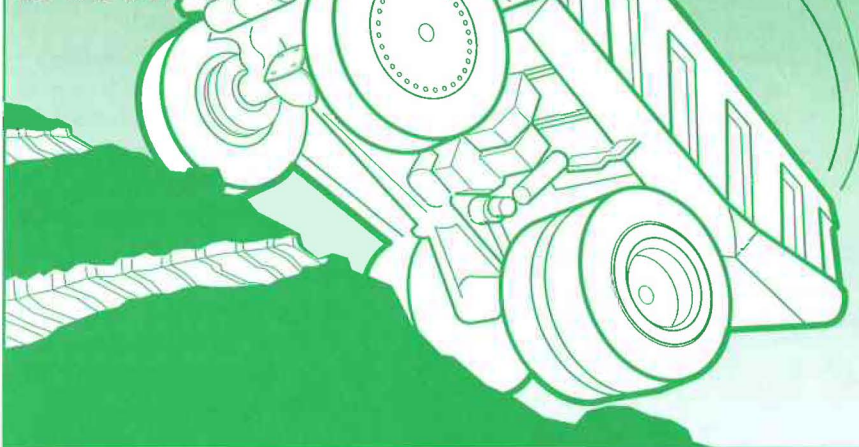
**Bruce Dial**, MSHA, Box 1166, Beckley, WV 25802  
Telephone: (304) 256-3215

**Alan Cook**, 16 S. Mikes Pike, Flagstaff, AZ 86001  
Telephone: (520) 774-2526

**Gary Cook**, La Plata Mine, Box 210, LaPlata, NM 87418  
Telephone: (505) 599-4105

*Submitted by Robert Glatter, Secretary-Treasurer, Holmes Safety Association*

## Preventing mobile equipment accidents by providing properly constructed and maintained safety berms



[This article represents the author's expertise in the design and construction of berms as viewed through the constructs required by the Virginia Department of Mines and Minerals. However, the information contained herein may apply to any site. Ed.]

Accidents involving mobile equipment have historically accounted for a significant number of accidents at surface mineral mining operations. The types of mobile equipment involved in accidents ranged from large haul trucks and excavators, down to small skid-steer loaders used for plant cleanup work. Regardless of the size or function of the equipment, all have the potential for operator injury if not operated in a safe manner and in a safe work environment.

Many accidents resulted from equipment overturning or toppling on elevated stockpiles near the plant or elevated roadways on pit benches. Most of these accidents could have been avoided if properly constructed and maintained safety berms had been provided. The purpose of a safety berm is to provide a margin of safety in the event of sudden human

error or mechanical failure of the equipment. An out-of-control piece of mobile equipment represents a serious hazard to mine employees and a potential financial loss to the company if the equipment is damaged or destroyed.

To be effective in preventing overturning and toppling accidents, berms must be properly constructed and maintained. There are at least three (3) factors that must be taken into consideration when determining the **minimum** width and height of berms:

- Largest size of equipment that will use roadway
- Speed limit authorized by company
- Grade (%) of road or ramp

Whenever there is an increase in any factor, there should be a corresponding increase in the width and height of the berm. In addition, the berm must be constructed of material that will effectively absorb the kinetic energy of the out-of-control equipment to prevent overturning or toppling. This can be achieved by constructing berms with a combination of large rocks and fines. Open

boulders are not recommended as they lack the ability to effectively absorb energy and may actually slide along with the moving equipment.

[Virginia] Department of Mines and Minerals Safety (DMM) & Health Regulation 9.12 requires berms or guards capable of restraining the largest vehicle used in the area shall be provided on the outer bank of elevated roadways. Such berms or guardrails are essential to ensure a safe work environment for mobile equipment operations. Mine development must provide ramps and benches wide enough for safe operation and passage of mobile equipment as required by DMM Safety & Health Regulation 3.3. In addition, they should be wide enough to allow ample room for the construction and maintenance of safety berms.

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

## New technology makes coal gasification more profitable

**Hot gas clean-up improves fuel efficiency without increasing sulfur emissions**

Carterville, Ill.—An Illinois scientist believes he has found a way to help coal gasification power plants like the Wabash River plant in Terra Haute, IN, remove sulfur emissions while significantly cutting capitol costs and increasing power plant revenues.

Jim Swisher, chief scientist and partner of E&A Associates, expects to know for sure this fall when seven tons of his zinc titanate pellets—a sulfur absorber that can be cleaned and reused perhaps 1,000 times—

receive long-term performance testing at a General Electric coal gasifier in Schenectady, N.Y.

Coal gasification, one of the nation's most promising clean coal technologies, turns high sulfur coal into low sulfur coal gas. The one problem with the process is that the coal gas, which is produced at temperatures that exceed 2,300°F, must be cooled to room temperature—about 70°—before the sulfur can be removed.

Zinc titanate can remove the sulfur from coal gas at about 1,000°. Coal gasification plants using this sorbent will have much smaller cooling systems and will use the remaining thermal energy to produce power more efficiently.

"Hot gas clean up using zinc titanate works just as well as cold gas clean up. The advantages are when power companies spend less building gasification plants and profit from the higher energy efficiencies to generate electricity," Swisher said.

Swisher estimates that hot gas clean up can increase power generation revenues by 3% or 4%. A 3% increase in revenues at Public Service of Indiana's Wabash River plant, which uses a cold gas clean-up system, translates into about \$6 million a year.



If this fall's tests at General Electric are successful, then 70 tons of Swisher's pellets, each the size of a BB, may be put to work in a 260-megawatt Tampa Electric coal gasification power plant—the nation's second commercial plant—in Lakeland, Florida.

Good reports from Tampa Electric could help solidify the future of coal gasification and the Illinois coal industry.

"Technologies like this will help eliminate any disadvantage Illinois coal has by making coal gasification plants more profitable," said Richard Shockley, director of Illinois Clean Coal Institute, which is funding Swisher's research. "Utilities in the U.S. and Europe are constantly looking for cheaper and cleaner ways to make electricity." The U.S. Department of Energy estimates that by 2040, coal gasification will supply 130 gigawatts of electricity—enough power to run 46 million all-electric homes. This power estimate translates into more than 427 million tons of energy rich coal a year. Much of that coal would come from

Illinois, which has 78 billion tons in energy rich coal reserves.

Swisher, who has been studying zinc titanate for four years, believes he has succeeded where other groups studying zinc titanate sorbents have not.

The problem that slowed the other groups' efforts is that many zinc titanate formulations aren't durable enough to withstand a thousand cycles of exposure to sulfur and cleaning chemicals. The pellets disintegrate in a matter of days, months before the chemically active zinc titanate wears out.

Swisher solved the strength problem by increasing the amount of titanium oxide (which gives the zinc titanate structural strength) and adjusting the manufacturing process. This "skeleton" of titanium oxide lasts as long as the sorbent, so both the physical strength and the chemical activity wear out at about the same time.

United Catalysts Inc., a Louisville, Ky., chemical firm, is producing the pellets for this summer's test in New York. The cost of the pellets is approximately \$7.60 a pound, but that figure could fall to \$5 as the pellets are produced in greater quantities.

In 1994, Swisher took early retirement from Southern Illinois University in Carbondale and formed E&A Associates with his wife, Susan, to study zinc titanate full-time. Swisher perfected his formula with ICCI support at the Coal Development Park in Carterville.

*Reprinted from the September 1996 edition of Acquire's COAL TODAY.*



## Play safe! Holiday toy tips

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By this time of the year, your children probably have compiled holiday wish lists for toys ranging from high-tech video games to fancy tea sets. Ironically, however, seemingly "safe" toys result in thousands of injuries, and even death, to children each year. More than half the deaths result from a child choking on a small object, such as a marble, ribbon, toy part, or balloon.

Pediatricians at Georgetown University Medical Center offer the following tips on choosing safe toys for children:

- Look for labels with age recommendations. Some toys and games that are safe for older children may contain small parts that are dangerous for younger children.
- Choose toys that are large enough so that children cannot choke on them. Make sure larger toys have no small or loose parts that can be swallowed or choked on.
- Avoid toys that are broken or coming apart at the seams. Many stuffed toys contain small pellets that can be inhaled or swallowed.
- Use a safe toy chest. Remove a free-falling lid that can slam shut and

smash tiny fingers. Look for a chest with supports to hold the lid open in any position or one with sliding panels or a lightweight removable lid.

- Select riding toys that suit a child's age and ability.
- Beware of flying toys and toy weapons—guns, bows and arrows and slingshots.
- Keep small children away from balloons.

*Reprinted from the Nov.-Dec. 1995 issue of Georgetown University Medical Center's Healthy Decisions.*

## Winners of the first annual training materials competition

In late March 1996, the Assistant Secretary of Labor, J. Davitt McAteer, invited Miner Training Instructors to enter a training materials competition. The competition was part of an initiative aimed at improving mine health and safety through the improvement of training materials and methods. The objective was to identify and share new and creative health and safety educational materials. Attached to the invitation letter was an explanation of the competition and the criteria to be used for judging. Competition was open to three categories of entrants: academia, states, and industry. Entries were to be made in three categories of content: coal, metal/nonmetal, and general, for a total of nine individual awards. In addition an overall winner was to be selected.

There were 16 individual entries in the competition. On October 15, a

panel of three independent judges studied the entries and selected the nine individual winners and the grand prize winner. Winners in each of the 9 categories and the grand prize winner received plaques with certificates. The presentations were made at the first combined TRAM Conference/National Mine Instructors Seminar/Holmes Safety Association Meeting On October 17. All entrants received a certificate of appreciation.

Ten plaques will be mounted on the wall at the Academy and the winners names will be engraved on the plaque each year. In addition there will be a "traveling trophy" to be inscribed with the name of the grand prize winner and will remain at the winners location until the next year's competition.

Plans are being made to advertise the materials submitted and make them available for all mine trainers.

The list of winners is as follows:

### **Academia**

**Coal:** Pennsylvania State University (PSU) (Harvey Roles II, training video)

**Metal/Nonmetal:** PSU (Harvey Roles I, training video)

**General:** PSU (Foreman's Handbook)

### **State**

**Coal:** Commonwealth of Virginia (Hazard Alert—Live Tomorrow)

**Metal/Nonmetal:** New York State (Back Facts)

**General:** State of Illinois (Degraded Image Hazard Recognition)

### **Industry**

**Coal:** Vigo Coal Co. (Refresher Training Exercise)

**Metal/Nonmetal:** Rohrer's Quarry, Inc. (That Will Never Happen to Me)

**General:** Pryce Parker (Effective Communication)

**Grand Prize—PSU**

## **THE LAST WORD...**

**There's a lot to be said for the fellow who doesn't say it himself.**— Maurice Switzer

**Time cuts down all, Both great and small.**— Anonymous

**Modesty may make a fool seem a man of sense.**— Jonathan Swift

**It never occurs to fools that merit and good fortune are closely united.**— Johann Wolfgang von Goethe

**He is the best physician who is the most ingenious inspirer of hope.**— Samuel Taylor Coleridge

**There isn't much to be seen in a little town, but what you hear makes up for it.**— Kin Hubbard

**In this world, full often, our joys are only the tender shadows which our sorrows cast.**— Henry Ward Beecher

**As if you could kill time without injuring eternity.**— Henry David Thoreau

**Glory paid to our ashes comes too late.**— Martial

**God heals and the doctor takes the fee.**— Benjamin Franklin

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

**REMINDER:** The District Council Safety Competition for 1996 is underway—please remember that if you are participating this year, you need to mail your quarterly report to:

**Mine Safety & Health Administration  
Educational Policy and Development  
Holmes Safety Association Bulletin  
P.O. Box 4187  
Falls Church, Virginia 22044-0187**

Please address all editorial comments to the editor, Fred Bigio, at the above address or at: MSHA—US DOL, 5th floor—EPD #535A, 4015 Wilson Blvd., Arlington, VA 22203-1984. Phone us at (we like to hear from you): (703) 235-1400



# **Holmes Safety Association Officers and Executive Committee 1995-1996**

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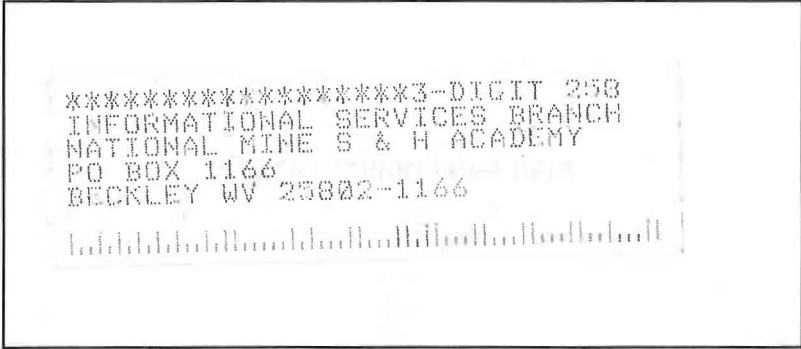
<i>Name</i>	<i>Representing</i>	<i>State</i>	<i>Name</i>	<i>Representing</i>	<i>State</i>	<i>Name</i>	<i>Representing</i>	<i>State</i>
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Marvin Nichols .....	Federal .....	VA	Steven Reyba .....	Mgmt. ....	PA	Desi Apodaca .....	State .....	NM
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Rexford Music .....	Federal .....	KY	Clifford Forrest .....	Mgmt. ....	PA	Tony Grbac .....	State .....	WV
Leland Payne .....	Federal .....	KY	Jon Merrifield .....	Mgmt. ....	OH	Douglas Martin .....	State .....	AZ
Joseph Pavlovich .....	Federal .....	KY	James Tompkins .....	Mgmt. ....	OH	Thomas Ward, Jr. ....	State .....	PA
Ron Deaton .....	Federal .....	KY	Mark Wharton .....	Mgmt. ....	CO	Joseph Sbaffoni .....	State .....	PA
Jon Montgomery .....	Federal .....	NY	Joseph Vendetti .....	Mgmt. ....	WY	William Garay .....	State .....	PA
Joseph Garcia .....	Federal .....	PA	William Craig .....	Mgmt. ....	WY	Paul Hummel .....	State .....	PA
Don Conrad .....	Federal .....	PA	Richard Burns .....	Mgmt. ....	WY	Ron Cunningham .....	State .....	OK
Donna Schorr .....	Federal .....	PA	Penny Traver .....	Mgmt. ....	MI	Phillip Johnson .....	State .....	KY
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Adele Abrams .....	Mgmt. ....	DC	Joseph Main .....	UMWA .....	DC			

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

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

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# ***JOIN and GROW with us***

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## ***Upcoming events:***



- *Dec. 19, New Mexico State Mine Inspector's Conference, Macey Center, N. Mex. Tech., Socorro, NM*
- *Jan. 26-30, 12th International Symposium on Management and Use of Coal Combustion By-Products: "Innovation for a Sustainable Future," Orlando, FL*
- *Feb. 19-21, South Central Dist. Joint Mine Safety & Health Conf., Sheraton Uptown, Albuquerque, NM*
- *Mar. 25-26, National Conference to Eliminate Silicosis, Mayflower Hotel, Washington, D.C.*