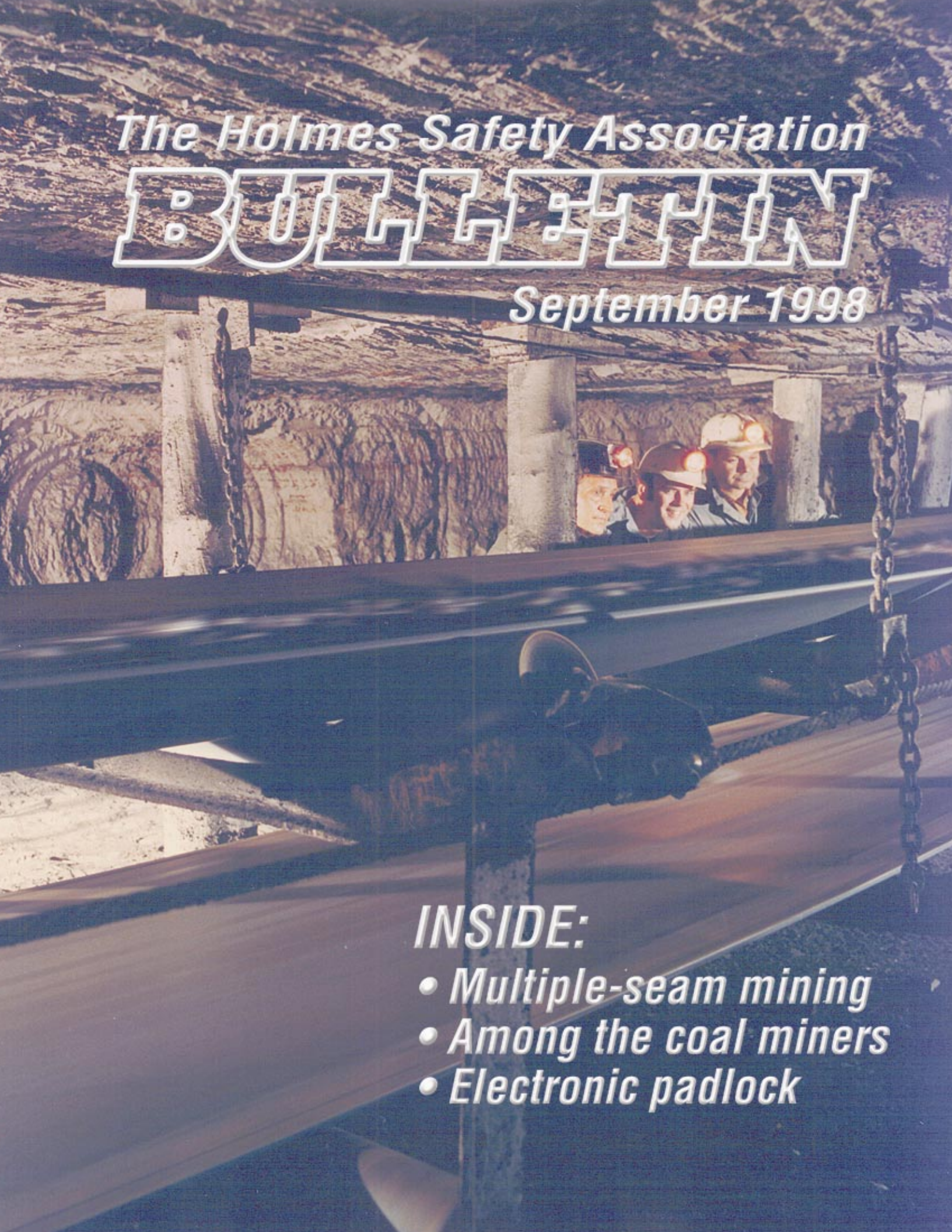

The Holmes Safety Association BULLETIN

September 1998

INSIDE:

- Multiple-seam mining
- Among the coal miners
- Electronic padlock

HSA Bulletin *September 1998*

contents:

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

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.

COVER: This month's cover is from the editor's collection of "old and older" photos, vintage 1970-1984, and indicates why we continually ask for submissions from our readers. If you have a potential cover photo, please send an 8" x 10" print to the editor, Fred Bigio, MSHA, 4015 Wilson Blvd., Arlington, VA 22203-1984]

KEEP US IN CIRCULATION
PASS US ALONG

High availability from haul trucks

*By Paul B. Harder**

Round Mountain Gold (RMG) in central Nevada, reports that over a nine-year period and a million operating hours, its fleet of 150-ton and 190-ton haul trucks has averaged better than 93% availability, with some of the trucks approaching 70,000 operating hours. Repair costs have been far below industry averages. Mine operations manager Pete Kesl credits the high availability and low repair costs to a succession of Product Support Agreements between RMG and Caterpillar dealer Cashman Equipment. He adds that good equipment and a high level of trust and cooperation between all parties to these agreements have been essential to their success at Round Mountain.

Seventeen Cat 785 150-ton trucks average 93% availability running some 7,000 hours a year. Several trucks are approaching 70,000 operating hours.

Product guarantees help Round Mountain Gold get 93% availability and lower fixed repair costs.

The big open pit, jointly owned by Round Mountain (a subsidiary of Echo Bay Mines), Case, Pomeroy & Co. and Homestake Mining, has had a succession of owners since the first claim was filed in 1906. Following consolidation under operator RMG in 1985 there began a steady and rapid increase in production from a mineable reserve now estimated at 302 million tons of ore with a grade of 0.024 oz/t gold. Mining increased from less than 100,000 tons/day in 1985 to over 200,000 tons/day today.

Over the same period, leached ore volume increased from 14,700 tons/day to 65,000 tons/day, making this arguably the world's largest open pit heap-leach operation. Though the grade of ore at RMG is low, proven reserves are large and are increasing as exploration continues. Present working life of the mine, which will ultimately be some 760 meters deep and 4,400 meters in length, is 17 years.

Doubling mine production over such a short period required fast expansion of ore excavation, hauling and processing. The biggest improvement has been with the haul fleet, which has grown from 10 85-ton trucks to 17 150-ton (Caterpillar 785) trucks, and 11 190-ton (Caterpillar 789 and 789B) trucks—nearly a six-fold increase in haul fleet tonnage capacity. Haulage capacity continues to increase as the haul fleet grows in response to the deepening of the pit and consequent lengthening of haul roads. The capacity and speed of excavation and loading has been increased with replacement of four hydraulic shovels by three P&H 2300 21.4 m^3 capacity electric shovels and a Caterpillar 994 17.6 m^3 capacity wheel loader.

In the case of the haul trucks the new equipment is both considerably larger than the units replaced, and more sophisticated. All engines of the new trucks—Cat 3512s and 3516s—have electronic unit injectors. The most recent deliveries are also equipped with computerized electronic control modules and a separate cab display and data storage system that together advise the truck operator when a vital component is operating outside safe parameters and also stores truck operating data for later retrieval and use in truck management and truck diagnostics.

This sophistication, combined with the trucks' capital cost and RMG's need for high availability at predictable cost, led RMG to ask truck suppliers to guarantee truck availability and repair costs as part of truck purchase agreements. In central Nevada such guarantees have an added value because the

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Round Mountain mine is 400 km from the nearest equipment maintenance facility, and from a labor pool with truck mechanics with the skills and training needed to maintain the new haul trucks.

A Product Support Agreement (PSA) that gave these guarantees to RMG was developed by RMG and Caterpillar dealer Cashman Equipment to cover the first four Caterpillar 785 150-ton trucks delivered to the mine in 1987. This agreement guaranteed an availability of 88% and like succeeding contracts also set a fixed per-operating-hour repair cost for major components: engines, transmissions and torque converters, final drives, bearing groups, suspension struts, brakes, radiators, electrical system and frame. If component failure causes truck availability to drop below 88% Cashman Equipment must bring in sufficient replacement trucks to bring availability back to at least 88%. The 1987 contract covered 25,000 operating hours or four years. Subsequent purchases of Cat 785 and 789 trucks have included similar PSAs and for progressively more operating hours.

Not included in the PSAs is the cost of preventive maintenance and the costs of fuel, tires, glass damage, and truck bed lining. Preventive maintenance (PM) was not included because RMG uses its pit equipment maintenance personnel for haul truck PM, and has built a PM facility adjacent to the haul road for this purpose. Other Caterpillar equipment (dozers, loaders, graders) is not included in PSAs because their widely varying operating conditions and hours make it difficult to accurately calculate component wear rates.

In fact, establishing a guaranteed component repair cost for the haul truck fleet that was both affordable for Round Mountain Gold and workable for Cashman Equipment was a complex undertaking that took the combined research resources of Caterpillar, Cashman Equipment and RMG. Application engineers and mine operations personnel from the three companies analyzed figures on the operating life of individual truck components and the working conditions at the RMG mine—the length, grade and condition of the haul roads, truck payloads, ambient temperature and the performance level of preventive maintenance—then predicted component life on the assumption that these factors would not deteriorate over the life of the contract. The resulting agreement was as much a product of mutual candor and trust as it was of research. It established the tenor of cooperation between mine, manufacturer and dealer that has allowed this, and succeeding PSAs, to profitably serve all parties for nearly a decade.

Since 1987 the original PSA has been renewed three times and now covers 70,000 operating hours, as do PSAs covering recent truck purchases. The Cat 785 trucks purchased in 1987 are now nearing the 70,000-hour mark, and still operate at 93% availability. In nine years and a million operating hours operating under a succession of PSAs there has never been a need for Cashman Equipment to supply added haul trucks to maintain the guaranteed 88% availability.

Production has doubled to 200,000 tons/day in less than ten years at Round Mountain Gold's low-grade mine in central Nevada, U.S., one of the world's largest heap leach operations. The pit will expand for at least the next 17 years.

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◀ ***Flexibility in mine excavation is helped by the mobility of a Cat 994 wheel loader and is one way RMG sustains 200,000 t/y mine production.***

RMG's Pete Kesl and Cashman representatives point to several factors contributing to the uncommonly high 93% availability. First, the presence on the mine site of a complete Cashman branch-warehouse has shrunk a 400 km supply line to a few meters. Truck parts that once took a day or more to reach the mine site are now available in minutes. Cashman Equipment reports that 95% of the parts needed for the RMG fleet have been immediately available at the Cashman RMG branch warehouse. Second, Cashman has eight full-time mechanics on staff at the mine, and in their 930 m^2 two-bay repair-office-warehouse complex they have state-of-the-art electronic testing and diagnostic equipment. The combination holds repair downtime on the trucks to the absolute minimum.

Preventive maintenance

A major, but less obvious, contribution to truck availability is RMG's pitstop PM program. This novel system reduces PM-related truck downtime while meeting Caterpillar's highest maintenance requirements. The program divides in half the maintenance procedures performed at 250-hour intervals. Instead, half of these maintenance procedures are performed every 125 hours. Through tight discipline and a team approach to each step of the 125-hour servicing the work is completed in three hours. By careful scheduling of truck arrivals at the PM facility a serviced truck leaves every three hours, just as the next truck arrives. The arriving driver moves to the serviced truck and returns to the haul. This system makes efficient use of drivers and maintenance personnel, and replaces the traditional full-shift service shutdown of every truck every 250 hours with two three-hour interruptions every 125 hours. The 125-hour service concept, which includes the pressure cleaning and inspection of a truck as part of its servicing, also provides twice the opportunity to discover and correct unsuspected problems.

As part of their relentless pursuit of ever higher availability at a controlled cost, RMG had new 190-ton Cat 789B trucks equipped with Caterpillar's Vital Information Management System (VIMS). This relies on a computer module that gathers, analyses, displays and stores truck operating data. A cab display warns the operator if an engine, drive train or suspension component operates outside preset limits and advises the operator of corrective action. The real time data that generates this information comes from sensors on the engine, drive train and suspension system and is stored in the VIMS module. It can be downloaded into a laptop computer where a Windows-based program analyses the data and organizes it into reports, graphs and histograms for diagnostic and truck management purposes.

After a year of accumulating truck operating data, the first VIMS units are now providing information on truck operations in unprecedented volume and accuracy to RMG and Cashman. Both use the VIMS reports to further increase truck availability, improve truck performance and control repair costs. Pete Kesl, studying a printout of VIMS-recorded Payload Measurement System data, discovered that trucks often pulled away from the shovels under-loaded—a major shortcoming in a mine where loaded trucks travel some 6.4 km up an adverse grade.

Cashman technicians reviewed VIMS data on a new engine that failed. The data showed the operating conditions of engine components before, during and after the failure. From this it was apparent that the failure was not caused by the driver over-speeding the engine. Instead VIMS data proved that the failure resulted from a faulty wrist pin.

Cashman and RMG both benefit when the VIMS reports lead to the elimination of component failure. Cashman has fewer component repairs; Round Mountain Gold has higher haul truck availability. In some instances information retrieved from VIMS simply helps on-road truck performance. Such was the case when a truck had a power loss when under load. A VIMS report showed the engine had unequal cylinder bank head temperatures, which led to locating an obstruction in an intake air manifold. The resulting temperature imbalance between the cylinder banks caused a loss of engine efficiency and power. When another truck was inspected for what was reported to be an engine power loss Cashman used a VIMS report to determine that the poor performance was the result of improper torque converter lock-up.

Even poor haul road conditions have been detected from VIMS reports. A truck Payload Measurement

System histogram of suspension strut nitrogen pressure showed the suspension system had a pressure spike whenever a truck traveled a particular section of the haul road. This led to the discovery of an unsuspected dip in the road that sharply jolted the loaded trucks. If the dip had not been discovered and repaired, the frequent stressing of the suspension would eventually cause strut leakage, failure or frame damage.

The value to Round Mountain Gold of this high availability from their haul trucks is put in perspective when Pete Kesl observes that the productivity gained from RMG's haul fleet operating at 93% availability, compared with that of a similar fleet running at 88% availability—in itself a high number—is more tonnage than a 190-ton truck can haul in a year. The repair cost report of this fleet is as good as its availability figures. Of an average per-truck operating cost of $104/h only 25% is spent on repairs. This is a third lower than the repair costs of most other fleets of hard rock mine haul trucks.

Long operating life of major truck components, and few unexpected component failures, explain both the high availability and low repair cost figures. Life-to-rebuild operating hours of components in RMG's Cat 785 150t fleet tells this story: engines, torque converters and brakes run for at least 15,000 hours; differentials, pump drives and finals are averaging better than 20,000 hours; struts and hoist cylinders are in service nearly 24,000 hours.

The measurable economic benefits to Round Mountain Gold and Cashman Equipment from the high availability and long component life of haul trucks covered by PSAs explains the support this concept is getting at Round Mountain Gold. Nearly a decade and a million hours of operating under these agreements says these results are no fluke. Knowledge of this is motivating interest in guarantees of equipment availability and repair costs among increasing numbers of mine properties and mining equipment dealers around the world.

Real time data on historic component performance is quickly retrieved from a VIMS-equipped Cat 789B using a communications adapter, laptop computer and VIMS Windows-based software.

Purchase contracts for new RMG trucks, like this Cat 789B being assembled at the mine by Cashman Equipment, include product support agreements that guarantee availability and repair costs. These agreements require trust and good communication to be affective.

Reprinted from the September 1996 edition of ***Mining Magazine.***

Multiple-seam mining

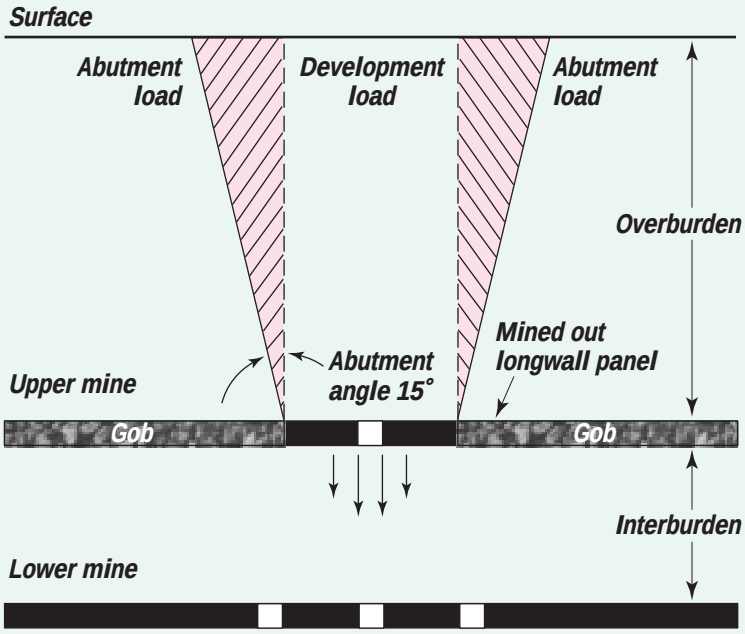
By Gregory J. Chekan

The Clean Air Act of 1992 required lower sulfur dioxide emissions, increasing demand for low-sulfur coal. Some of the the low-sulfur coalbeds in the Appalachian Coal Region occur at depths ranging from 500 to 2,000 feet. Historically, coal in this region has been mined without consideration for the influence on other adjacent coalbeds. As a consequence of this practice, environmentally acceptable compliance coal may be more difficult to mine because of ground control problems associated with multiple-seam mining. Developing design technology or models to safely mine coal above or below an existing mine provides an economic and employment opportunity and a domestic source for U.S. energy requirements.

Multiple-seam mining requires a comprehensive understanding of the stress transfer that occurs between two coalbeds. Obviously, mine design is crucial for roof, rib, and floor stability. Pillar and entry dimensions, positioning, as well as the timing during mine development, affect overall conditions in the mines.

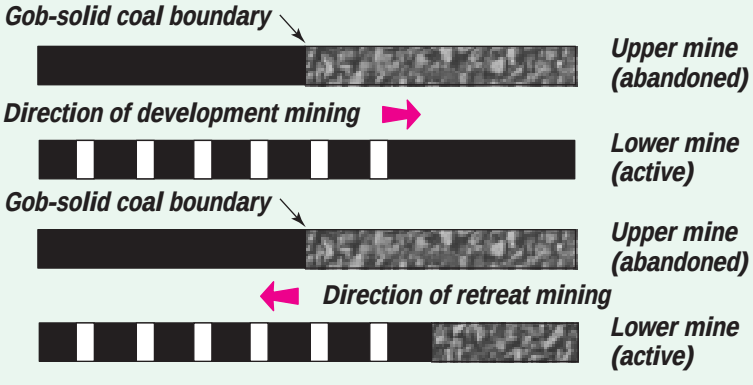
Multiple-seam mining research, for the most part, has concentrated on two areas. The first area constitutes the bulk of the research to date and involves the analysis of field data. These empirical studies involved observation or use of geomechanical instrumentation to gather data leading to descriptive conclusions of ground problems and design recommendations for improving operation stability. Empirical studies based on case study documentation have revealed the factors under which interactions of the coalbeds are most likely to occur. These studies showed that both geology and mine design influence interactive distance, magnitude, and location.

Figure 1.—



Other multiple-seam research involves the use of numerical methods for predicting interactive problems. These methods combine case study results with theoretical and statistical analysis in attempting to develop optimum mining plans for multiple-seam conditions. Photoelastic and numerical models have provided insight and improved understanding of mining-induced stress and interactions with other workings. Numerical models can also simulate relative stress distribution and transfer under varied design parameters or conditions.

Figure 2.—



Health and safety research has provided practical information and guidelines on multiple-seam design for both longwall and room-and-pillar mining. For instance, a method was developed to assist operators size lower-seam gate road pillars when super-positioning is practiced in longwall mining, as shown in Figure 1.

In room-and-pillar operations, high stress zones are usually encountered in the lower mine when mining beneath an isolated barrier pillar or a gob-solid coal boundary in the upper mine. To reduce stress in the lower mine pillars, retreat mine from the gob to the solid side of the boundary and support the barrier edge with a row of pillars, as shown in Figure 2.

Reprinted from NIOSH's Pittsburgh Research Center's ***Mining Health and Safety Update—Research Profiles****.*

Information Circulars 9360 and 9403 provide more detail on multiple-seam research. For a copy of these reports or additional information, call Greg Chekan at (412) 892-6749 or Dave Ingram at (412) 892-6547.

Mechanical hard rock mining: present and future

The advantages offered by mechanical mining have been demonstrated in the underground mining of coal, evaporites and other soft minerals.

Mechanical mining and the advancements in automation technologies have been the principal drivers towards the realization of enhanced productivity in soft rock mining.

For the past two decades, emphasis has been placed on developing mechanical mining technology for hard rock applications to achieve similar productivity improvements and cost reductions. The benefits of mechanical mining are numerous, particularly in an industry where market conditions continue to dictate higher production and lower costs while maintaining high safety standards.

Other benefits of mechanical mining include reduced ground support and labor requirements and the elimination of blast and diesel fumes. These benefits further make this technology an attractive alternative to drill and blast for hard rock mining. Mechanical mining is conducive to full implementation of remote control and automation technologies that are under development to achieve further productivity and safety improvements in underground mining.

Mine development has been the main focus area for mechanical miners by manufacturers and mining companies. Potential applications include ore body access, haulage and ventilation drifts, undercut and exploration drifts. The economic use of this technology in mine production is still considered many years away. It would need a major technological breakthrough that would make mechanical rock fragmentation competitive with the large-scale, low-cost production blasting operations.

The TBM revolution

The transfer of existing rock excavation technology from the civil underground construction field has been one approach to the development of mechanical hard rock mining technologies. In this regard, tunnel boring machines (TBM) have revolutionized the civil tunnel construction field. So TBMs are the obvious candidate for use in mine development.

Some of the earlier attempts of this technology transfer failed to meet expectations. This was due to the use of existing machinery that was not suited for the conditions and requirements of mine development projects. However, when a machine was modified or a new one was built to meet the needs of mine development, the application of TBMs resulted in cost and time savings compared to conventional methods.

Two examples of successful TBM applications in hard rock mining are the Stillwater Mine and Magma Copper's San Manuel Mine. In the latter case, a 4.62-m(15-ft-) diem TBM drove more than 10 km (6 miles) of tunnels for the development of the Lower Kalamazoo ore body. After initial startup problems and certain machine modifications, this TBM was able to attain an average advance rate of about 22 m/day (72 ft/d). This rate could not be matched with even the most advanced drilland-blast method.

TBMs are large, heavy pieces of equipment designed primarily to excavate long, straight tunnels. Therefore, their application to mining is limited to longer drives without sharp turns, as was the case at Magma. In response to the needs of the mining industry, TBM manufacturers have developed designs to allow a tighter turning radius and more system flexibility with the capability to handle adverse and changing ground conditions.

Despite these new features, however, TBMs still are not suited for the day-to-day development needs of hard rock mining where system mobility and versatility are important. However, for initial mine development efforts where long drivages are generally required, TBMs are a cost-effective and productive alternative to drill and blast.

It is also important that mine development plans are tailored along the capabilities and limitations of TBM technology to gain the utmost benefit from its application. This means making every attempt to configure the development plans to best fit the basic features of TBM excavation.

The hard rock mining industry needs a mobile excavator that can meet the daily development requirements of the mine. This means a "continuous

miner" that can economically cut hard rock. The desired features of such a system include high reliability along with high mobility and flexibility for easy relocation in the mine. In addition, the excavator should not represent a major capital investment for the mine.

These may appear to be unattainable goals. However, during the past two decades, intense development efforts have made progress toward meeting this goal. The most notable among these are the Robbins Mobile Miner, the Wirth continuous mining machine and the hard rock roadheader program that was jointly pursued by Eimco and the HDRK research consortium in Canada.

All of these development efforts have achieved some degree of success. They demonstrated their potential and the benefits of replacing drill-and-blast techniques with mechanical mining. Field tests also helped identify the direction of future development to come up with a truly mobile miner that can economically excavate hard rock. With continuous advancements in technology, these systems will reach their full potential of providing a mobile and economic mechanical excavation system to the hard rock mining industry.

New bit technology needed

The biggest obstacle to full development of mobile hard rock excavators is the lack of bits that can cut hard rock with long life and low replacement costs. The systems under development have the necessary power and force to cut hard rock. But it is the cutting bits that have to transfer this power into the rock.

The mobile miner and the continuous mining machine use large disk cutters that can cut hard rock. However, these disk cutters require high levels of force to penetrate the rock, which dictates high machine thrust and power requirements. This means large machine weight and, consequently, reduced mobility. Roadheaders are flexible and mobile machines that are used in soft rock mining. They use drag bits that are limited in the strength of rock they can economically excavate.

What is needed, then, is a new cutting tool that can excavate hard rock with relatively low force requirements while providing a long life against abrasive or structural type wear.

Recent efforts have been on improving drag bit performance, including diamond-coated carbides, with marginal success. Unless some revolutionary material development occurs that will extend the life of drag bits, they will not find an economic application in hard rock.

Some performance augmentation techniques, such as water-jet-assisted cutting, have been researched to improve drag bit life. Although some promise has been shown in laboratory trials, these techniques have not been successful in field applications and have not found their way into commercial use.

Disk cutters can economically excavate hard rock. However, the current large size of disk cutters makes them unsuitable for hardrock mobile miner applications because the large machine weight restricts mobility. So manufacturers and research organizations have been developing smaller minidisk cutters. Disk cutter force requirements are a function of diameter. Therefore, the smaller the size, the lower the thrust requirements to penetrate the rock.

The intent is to develop a cutting tool that can economically excavate hard rock with low force requirements. This is so that the machine weight can be minimized to make it mobile while lowering its capital cost.

Minidisk cutters ready for hard rock use

One such successful development of minidisk cutters has occurred at the Earth Mechanics Institute (EMI) of the Colorado School of Mines. Design and testing at EMI during the last several years culminated in the development of minidisk cutters as small as 82 mm (3.2 in.). Laboratory and field testing in a variety of hard, abrasive rock formations have proven the ability of these minidisks to cut hard rock with low force requirements and acceptable bit life. This new technology is ready for application on roadheaders, continuous miners and a newly developed drum miner concept.

New, more efficient cutting tools, such as the minidisk, are not the only answer to developing truly mobile hard rock mechanical miners. More knowledge and understanding is needed of how the rock breaks under the action of a mechanical tool. Today's cutting tools are forced into the rock through a crushing action by working against the compressive strength of the rock. A better understanding of rock-tool interaction must be developed to take advantage of the tensile strength of rock, which is a fraction of its compressive strength. So more work is needed in developing new tool designs to cause rock failure in a more efficient manner. In addition, current techniques to predict machine performance and excavation costs must be improved to enable more accurate and reliable analysis of machine mining economics compared to conventional methods.

Conclusions

The future of mechanical hard rock mining is bright. The hard rock mining industry will soon begin to reap the same benefits of mechanical mining that their soft rock counterparts have been enjoying for many years.

Achieving this goal does, however, require a continuous and strong commitment among manufacturers and the mining industry. This means closer cooperation among all parties involved to share the risks and the uncertainties typical of any new technology development and implementation.

Unfortunately, the source of this article was missing from the information base in residence on my computer. If anyone recognizes the source, please let me know so that I can give proper recognition. The Editor.

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Selecting the right protective clothing for the job

By Jim Blose Category Manager, Protective Apparel
Kimberly-Clark, Away From Home Sector

Choosing the most appropriate protective apparel is a job in itself. With differing standards and guidelines, changing regulations, and a checklist of criteria including design, fit and cost, there's a lot to consider. Of course, the primary responsibility of protective clothing is to protect the wearer—the critical factor in selecting proper apparel.

Risk assessment is the first step

Safety professionals and their employers must, at all times, identify and understand the potential hazards workers may be exposed to and properly train them in selecting and wearing the appropriate apparel.

The first step in choosing the right protective clothing for the job is to identify the substances (particulates, liquids and gases) present in the work site as well as the hazards associated with these substances (i.e., dermal toxicity, reactivity, etc.). A survey of the work site must be completed listing physical or environmental hazards, such as sharp instruments, rough surfaces or machinery. Also, make a list of who will be wearing the clothing, the work that person will do, and what equipment will be used.

Once this task has been accomplished, determine the potential hazard exposure for each worker task. Ask the following questions to determine if there is anything specific to the worker task(s) that will require special protection:

- What state will the hazardous substance be in (solid, liquid, or gas)?
- What is the route of potential exposure (respiratory, dermal, or ingestion)?
- Is exposure expected?
- What is the frequency and duration of exposure?
- What are the expected short- and long-term physical outcomes if exposure occurs?
- What engineering changes can be made to eliminate or minimize the hazard?
- Will all machinery be properly guarded?
- What changes can be made to worker tasks to eliminate or minimize the hazard?

Once the task is engineered as safely as possible, it is time to turn to protective apparel. Protective clothing should be evaluated based on its fabric, seam construction, and overall design, sizing and fit.

When selecting chemical protective clothing, it is important to ensure that the garment offers adequate resistance to the hazardous chemicals being handled in the workplace. HAZARD-GARD garments from Kimberly-Clark, pictured above, are seamless in the primary splash area for added protection.

Fabric selection that doesn't sacrifice comfort

In general, the nature of the hazard will guide you to the appropriate clothing. Breathability and comfort of the garment are also critical factors, especially when trying to prevent heat stress. Keep in mind that when workers are more comfortable, they're more productive. With today's advances in materials and designs, there's no need to sacrifice comfort for safety.

For tasks involving non-hazardous substances where keeping clean is most important, lightweight, breathable and durable fabrics will serve the purpose. When working with non-hazardous, particulate substances like dirt, sand, and grime, you need to make sure the fabric demonstrates adequate particulate hold-out properties. The key here is to find a fabric that resists particulates from the outside while allowing moisture, vapor and air to pass through for added comfort. In these situations, spunbond/ meltblown/spunbond laminates have proven to provide an excellent balance of comfort and protection.

Situations where there is non-hazardous liquid splash or mists, such as water, oil, or detergents, call for a fabric with liquid resistance. Look for garments with outer layers constructed of a cloth-like, yet tough and abrasion-resistant spun bond polypropylene. Middle layers made of a breathable microporous film offer resistance to many non-hazardous liquids and particulates without compromising comfort. Garments like this are often chosen for use in manufacturing plants, nuclear facilities, utilities, agricultural settings, fiber glass handling, plus pressure washing and cleaning applications.

The highest level of fabric protection is needed for hazardous liquid or vapor exposure. Special gas or vapor protective suits may be required where exposure to hazardous vapor or gas can occur. These suits have a construction in which not only the fabric needs to resist hazardous materials, but the suit also maintains 4" positive air pressure with up to a

20% drop in pressure after four minutes in a standard inflation test (ref. ASTM F1052). Since hazardous liquid or vapor exposure may pose a serious threat to health, the fabric used must demonstrate appropriate resistance to the chemicals handled in your workplace.

When choosing chemical protective apparel, penetration and permeation testing of the fabric should be considered. Penetration is the flow of bulk liquid through a material, or through seams or closures. Penetration resistance of protective clothing materials is measured using ASTM F903, a standard test method that visually determines material barrier performance against liquid chemicals under conditions of continuous contact. Permeation is the process by which a chemical moves through protective clothing material on a molecular level. ASTM F739 provides a standard test method designed to measure the resistance of protective clothing materials to permeation by liquids or gaseous chemicals under condition of continuous contact.

It is important when looking at manufacturers' permeation and penetration data to ask the following questions about reported results:

•How recent is the data? Continual improvements in testing methods and detection may make recent testing more accurate.

•How confident can you be in the data? More tests improve the accuracy of reported results. Repeated testing ensures that the results are representative of the current product performance.

•How reliable is the data? Was the testing done by an independent laboratory? Are the results reviewed for accuracy?

Garment fabrics are available with anti-static treatments to reduce static build-up and the likelihood of discharge—a consideration for workers in sensitive manufacturing, electronics, aerospace, pharmaceutical, and research laboratory settings. In addition, some garments feature a "glazing" process, which ties down outer fibers for low-lint performance. These garments can be appropriate for critical painting and finishing jobs in which lint can cause defects.

Seam construction

Seams on a garment are as important as the fabric, because they are the most vulnerable part of the garment. Look for garments with seams on the back instead of the front. This provides more protection up front, where it's needed most.

Serged seams, a basic stitched seam, are most common in general protection apparel, where resistance to hazardous substances is not intended. Look for a three-thread overlap stitching for the strongest, most durable seam. A bound seam is reinforced with binding for strength and tear resistance. A taped seam is serged, then reinforced with a film tape designed to be resistant to water and many liquid chemicals. Serged and taped seams are most often found in liquid chemical protection garments.

The right design and sizing helps ensure effective use

Lastly, evaluate the garment's design. If the exposure potential is low, risk may be isolated to specific body areas. In this case, all you may need are sleeve protectors or an apron. However, for moderate to high risks, full-body garments may be necessary.

Consider the combination of protective apparel and equipment that will be needed. Look at the garment's hood, sleeves and cuffs to make sure that they work with other required equipment such as respirators, gloves and footwear.

Sizing and cut are also critical. Remember, if the garment doesn't fit, the apparel itself may become a hazard. Look for a generous cut, especially across the shoulders, body and key stress areas like the crotch. In addition to enhancing comfort, a fuller cut helps to reduce pulls, tears and ripouts, protecting workers from an unplanned exposure, and ultimately reducing the number of garments used. An elastic waist can act as a belt for a better fit. A concealed zipper offers added strike-through protection, and a longer zipper on coveralls will make them easier to pull on and off.

Getting the best from your garments

Remember that protective garments won't provide the required protection once they're damaged. Garments should be replaced immediately if ripped, torn, abraded, punctured or if wear is observed in the outer layer of the material. Many protective garments are not flame resistant, so keep them away from sparks, flames, and explosive environments.

As a final note, keep in mind that the guidelines outlined above do not cover all considerations that must be made as part of a complete risk assessment. People involved in selecting protective apparel must be adequately trained and have a thorough understanding of workplace hazards and the selection of personal protective equipment.

For additional information, contact Kimberly-Clark Corp., 1400 Holcomb Bridge Rd., Roswell, GA 30076-2199, 800/835-8351
Reprinted from the May 1998 issue of the Rimbach Publishing Co.'s ***Industrial Hygiene News.***

Study shows that back supports may reduce low-back injuries

Workers who wear back supports can reduce the number of low-back injuries by about one-third, according to findings from the largest-ever study of the increasingly popular—yet unproven—devices conducted by the UCLA School of Public Health.

Researchers from UCLA studied the workplace injury history of 36,000 workers of a national home supply store chain over a six-year period. They found that low-back injuries fell by about one-third after the company imposed a mandatory policy on back support use.

"We found compelling evidence that back supports can play an important role in helping to reduce back injuries among workers who do a lot of lifting," said Jess Kraus, an epidemiologist and director of the UCLA-based Southern California Injury Prevention Research Center. "Along with worker training and proper workplace ergonomic design, back supports can be part of an overall back injury prevention program," Kraus stated.

More than one million workers suffer back injuries each year, accounting for one-fourth of all workers compensation claims, costing businesses billions of dollars each year.

Back supports have become standard issue for a wide variety of workers over the past several years, despite there being little scientific inquiry into whether the devices help prevent injuries.

Several smaller studies have found equivocal results about the effectiveness of back supports. The National Institute of Occupational Safety and Health reviewed the scientific findings and issued a report in 1994 that concluded that the benefit of the back support remained unproven and did not recommend that they be used by uninjured workers.

Worker analysis

The UCLA researchers examined the effectiveness of back supports by analyzing worker injury data collected by home improvement retailer Home Depot on 36,000 people who worked at its 77 California stores from the start of 1989 to the end of 1994. The company imposed a mandatory back support use policy that was phased in between 1990 and 1992. Analyzing injury reports and other worker information, UCLA researchers found that Home Depot workers sustained about 31 back injuries per one million work hours without the supports, compared to about 20 injuries per one million work hours after the mandatory back support use policy was imposed. "I went into the study very skeptical about claims that these back supports could help reduce back injuries," Kraus said. "I suspected we would not find any positive effect, so I was very much surprised by our findings."

Wearer benefits

The benefits of wearing the back supports was seen in men and women workers, in young and older workers, and among workers engaged in low and high levels of lifting, according to the UCLA researchers.

The biggest benefit was among the group of workers at highest risk of back injury—men who were 25 and younger or over age 55, had worked for the company for one to two years, and had jobs that required the highest intensity of lifting.

Home Depot employees logged more than 100 million work hours during the study period. The company imposed no additional workplace training or safety measures during the study period that could account for the drop in low-back injuries, according to researchers.

"People need to be careful about generalizing these findings to workers

who are not engaged in material handling jobs," Kraus said. "There needs to be further research examining occupations such as construction, agriculture and mining to see if back supports prevent injuries to those workers. There is still no evidence that back supports provide any benefits to weekend do-it-yourselfers," he added.

The Southern California Injury Prevention Research Center is one of 10 injury prevention research centers sponsored nationally by the U.S. Centers for Disease Control and Prevention. The Center emphasizes study of injuries in high-risk, ethnic/racial minorities and other traditionally under-served populations.

Funding for the back support study was provided by the Southern California Injury Prevention Research Center, the UCLA Center for Occupational and Environmental Health, the California State Department of Industrial Relations and the 3-E Company, a San Diego-based industrial safety consulting firm. No funding from back support manufacturers was used for the research.

The study, published in the November issue of the International Journal of Occupational and Environmental Health, was co-authored by Kathryn A. Brown, Davids L. McArthur, Corinne Peek-Asa and Lei Zhou, all of UCLA, and Lupe Samaniego and Chris Kraus of the 3-E Company.

Reprinted from the March 1997 issue of the Rimbach Publishing Co.'s ***Industrial Hygiene News.***

Metal and Nonmetal accident summary

Fatal fall of person accident—surface limestone mine

General information

A contract laborer, age 40, was fatally injured at about 10:10 am on January 19, 1998, when he fell through an opening in the floor of a screen tower to the ground. This was the third day the victim had worked on this job. He had no mining experience but had worked as a millwright for about eight years at a factory. He had not received training in accordance with 30 CFR Part 48.

The quarry, a surface limestone mine, was was normally operated two, 10-hour shifts a day, five to six days a week. Total employment was 98 persons. Limestone was drilled and blasted from multiple benches in the quarry. Broken material was transported by truck to crushing and screening plants where it was sized and stockpiled. The finished product was sold for road and building construction.

A construction company had been contracted to remove and replace two screens and associated chutes and hoppers in the plant and began working on site January 5, 1998. Four to six workers were assigned to complete the job.

The victim was one of three workers hired by the construction co. through a temporary worker service. His first day on the job was Wednesday, January 14, 1998.

Description of accident

On the day of the accident, the victim reported for work at about 7:30 am, his usual starting time. He was assigned the task of cutting the large pieces of chutes and hoppers on the fourth floor of the screen tower into smaller pieces so they could be lowered to the ground with a crane.

Work progressed normally for the victim and the four other workers until after their morning break. The victim returned to the fourth floor with two co-workers, who were also temporary worker service employees, along with another employee who worked for the construction company.

A worker on the ground unhooked the lowered steel pieces from the crane. The construction company employee was attaching the pieces to the load line and giving signals to the crane operator as the pieces were hoisted. The other temp worker and the victim were using torches to burn holes into the pieces to be hoisted. The second temp worker watched the pieces to be sure they cleared the walls and support structure of the building as they were removed.

At about 10:10 am, the second temp worker saw the victim step across the opening in the floor on the south side of the west hopper and reportedly warned him not to cross the opening. The victim continued and sat on the edge of the hopper with his legs inside. The victim raised himself on his hands off the edge so he could slide down into the hopper. He fell backward through the opening in the floor, passing through the empty storage bin, to the ground.

The stunned co-workers rushed to the ground where the victim was lying. Another worker heard the commotion and also ran to the scene. They found the victim unresponsive and attempted to give him first aid. Local authorities and emergency medical personnel arrived a short time later and the victim was pronounced dead at the scene.

The victim was not wearing a safety belt and line when he fell. A safety harness and line were available in a makeshift shelter located on the same floor. A sign next to the stairway leading to this floor had been posted by the mining company for their plant employees and instructed them to use a harness and line when entering bins. Neither the quarry operators or the construction company made daily workplace examinations in this area. Reportedly, mining company personnel were in the area on three occasions after work had begun.

Weather conditions at the time of the accident were cold with light snow.

The accident occurred at the #4 and #5 screen tower in the plant. The tower was about 85 feet tall. A conveyor head pulley with discharges, two screens, chutes, and portions of two hoppers had been removed from the tower. Removal of these components created several openings, some to lower levels and some to the ground—a distance of about 50 feet. Access to this floor was by either walking along the conveyor belt that discharged onto the screens or by a stairway on the east side of the building.

Conclusion

The accident was caused by failure of the mine operator and contractor to cover or barricade the opening in the floor. Management's lack of procedures to ensure usage of a safety belt and line contributed to the severity of the accident. Additional contributing factors were lack of daily workplace examinations and failure to indoctrinate new employees in safety rules and procedures.

Edited from an MSHA accident report by Fred Bigio.

Competition prepares rescue teams for worst

By Julie Baxter, staff writer

If an unthinkable mining accident were to happen tomorrow, seven mining teams from Colorado, Utah and Alabama would be ready.

Mine rescue teams traveled from across the region, and, in the case of the Alabama team, from across the country, to compete in the fourth annual Northwest Colorado and South Central Wyoming Underground Coal Mine Association mine rescue competition. After three days in Craig and testing their mettle against simulated disasters and emergencies, as well as each other, the teams are now prepared for events they don't want to happen.

The competition and others like it are one of a few ways the teams keep their minds sharp and their bodies ready—just in case.

"It is important," said Dianna Ponikvar, a member of the Cyprus-Twentymile Coal Company red team and an employee at the mine. "This is the most practice you're going to get. If something were to actually happen, the competition is what keeps you up on your skills for a real mine disaster."

The importance of the event doesn't negate all the fun, however.

"It's a lot of fun to get some hands-on experience," said George Motte, a member of the Cyprus Plateau-Willow Creek team from Helper, Utah.

The competition stays friendly, for the most part. Ponikvar said seeing team members from other states is like being reunited with old friends.

But friendly competition doesn't rule out rivalry.

"It gets kind of fierce," Motte said. "There's a lot of team pride in it, a lot of pride amongst companies."

John A. "Jack" Kozar, District 9 manager for U.S. Coal Mine Safety and Health, agreed competitions and contests are vital to keeping members' performances up to the best of their abilities, and credited the men and women for giving so much.

"These team members have a lot of commitment," Kozar said. "Not only the team members, but their families. (Team members) put their lives on the line save their fellow miners in the event of a disaster."

The competition also fosters a sense of friendship and faith between teams. Boam said if a real disaster were to happen in the region, the same teams competing against each other in Craig would back each other up and share the load until the crisis passed.

"It builds camaraderie between various teams," Kozar said of the competition. "(The competition) is a very good opportunity to build not just connections between them, but to build trust."

Just as in the case of a real emergency, the competition brings together the variety of players who would respond to a disaster.

"There's a lot of different factors," Kozar said. "State and federal governments and industry coming together as a team."

The skills applied in competition are also applied every working day at the mines. Every team member also works in some capacity in their "home" mine. Ponikvar, for example, was a coal miner for four years before moving to a position where she monitors the warning systems at Cyprus-Twentymile. Motte "works the belts," or in laymen terms, works the conveyor system that brings the coal out of the Willow Creek mine.

"They see it in the mines first," Boam said. "The gas testing and stuff they're doing in the competition, they're doing on a daily basis, before every shift in the mines. Observing for hazards is done daily."

The keen observation and early recognition seems to be paying off. Kozar said District 9 encompasses all of the coal mines west of the Mississippi, which covers 16 states from Louisianna to Alaska. With the largest territory of any district in the country, District 9 does not have an accident rate to match its size. Kozar said his district has the lowest accident-injury rate in the United States.

Tuesday through Thursday, running simulated gauntlets of injured workers, dangerous conditions and faulty breathing apparatuses, the team members proved why their district is number one when it comes to safety.

The competition began with the "bench" event which pits individuals against two types of breathing apparatuses, BG-4 and BG-174, in search of "bugs," or problems, that would make the gear function improperly or not at all.

Wednesday, the contests continued with six-member mine rescue teams braving a simulated mine shaft at Craig Middle School. The teams were looking for survivors of an explosion while plodding through the mine, mapping their steps and marking hazards as they went.

Thursday the last events, first aid and Emergency Medical Technician contests, were held in the CMS gym. In the first aid competition, teams had to improvise using commonplace items to treat a patient with a variety of injuries. In the EMT event, modern medical equipment was used to treat a worker who had fallen 16-feet and sustained multiple injuries including having a

screwdriver impaled through his right foot.

To celebrate the completion of the events and to mark another successful competition, teams, guests and visiting "dignitaries" gathered for dinner and awards Thursday night.

Link Derick, who co-chairs the association with Boam and also is a key player in the competition, Sen. Dave Wattenberg (R-Walden), and Boam poked fun at a variety of subjects before, during, and after the trophies were handed out.

The glass, wood and bronze trophies aren't the only rewards of the competition. The event also benefits the community.

"It serves to highlight Craig and Moffat County, as well as giving us a chance to meet folks from other areas," said Moffat County Commissioner T. Wright Dickinson.

The competition is run on a break-even basis. Derick said money donated by sponsors and paid by teams is used to pay for the events, the trophies and guests at the dinner. Any profit made is given back to community organizations. This year, the Lion's Club, the Boy Scouts, the Moffat County High School wrestling team and a Craig youth group were the recipients of that generosity.

Local ambulance service workers also benefited. Some extra money earned was used to pay for those workers to attend the banquet Thursday and hear from EMTs who were involved in the rescue following a tornado that ripped through Alabama on April 8, 1998.

Dale Johnson, a member of the Jim Walters Resources team from Tuscaloosa, Ala., showed slides and recounted the intensity of those efforts. Johnson said mine rescue workers are often a resource overlooked by the community to help in times of disaster, but are often skilled and equipped to handle things other agencies are not.

Mine rescue workers offer valuable support in any disaster, Johnson said. He pointed to the teamwork and discipline, search and rescue techniques, and the equipment and knowledge that mine rescuers can bring to the table in the event of a natural disaster or other emergency.

"And you have heart," Johnson said. "It's just like the wind—you can't describe it, but it's there."

Teams competing

Mines competing in the competition included two teams from Cyprus-Twentymile Coal Company in Oak Creek, Colo.; two teams from Energy West Mining in Huntington, Utah; Blue Mountain Energy (Deserado) from Rangely, Colo.; two teams from Cyprus Plateau-Willow Creek in Price and Helper, Utah; Canyon Fuel Company Skyline Mine in Scofield, Utah, and Jim Walters Resources in Tuscaloosa, Ala.

Winners of the competition were:

- Mine Rescue Competition—first place, Deserado black team; second place, Energy West blue team; third place, Energy West silver team; fourth place, Cyprus Plateau-Willow Creek red team.
- First Aid Competition—first place, Jim Walters Resources No. 1, second place, Energy West silver team; third place Deserado black team.
- EMT Competition—first place, Jim Walters Resources No. 2; second place, Jim Walters Resources No. 1; third place, Canyon Fuel Company Skyline black team No. 1.
- Combination Competition (mine rescue and first aid)—first place, Jim Walters Resources No. 1; second place, Energy West silver team; third place, Deserado black team.
- Bench Competition (BG-4)—first place, Mike Camp of Cyprus Twentymile; second place, Troy Hatch of Canyon Fuel; third place Mark Beauchamp of Cyprus Twentymile.
- Bench Competition (BG-174)—first place, Kelly Duke of Energy West; second place, Ernie Martinez of Cyprus Plateau-Willow Creek; third place, Robert Hill of Energy West.

Reprinted from an MSHA press release and a subsequent article appearing in a Colo. newspaper.

Ergonomic modeling software reduces workers' comp claims

Risk Enterprise Management Group (REM), a subsidiary of the Zurich Insurance Group handles workers' compensation payout claims.

At REM, an ongoing effort is in place to analyze and track loss control at the ergonomics level. The ongoing assessment and re-design consultation program utilizes ergonomic analysis and modeling software to simulate human movement.

This program is used to objectively analyze REM's worker compensation exposure to help REM reduce its payout on a $5.4 billion claims portfolio. The software is also used to identify solutions that will help workers get back into the workforce more quickly and lower the company's compensation costs.

The software utilized is MannequinPRO. The Windows-based human design and ergonomic modeling software is equipped with biomechanical analysis and NIOSH equations to provide detailed calculation involving forces, angles and weights.

For additional information, contact: HumanCAD Systems Div., BCAM International Inc., Suite 210, 3100 Steeles Ave. West, Concord, ON L4K3R1, 800/248-3746, FAX: 905/761-7681, web: www.humancad.com
Reprinted from the March 1998 issue of ***Industrial Hygiene News.***

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Coal accident summary

Fatal fall of rib—(underground coal mine)

General information

The operation is an underground coal mine and employs a total of 495 miners, with 159 employees located on the surface. The mine is opened into the Harrisburg No. 5 Coal Seam by two shafts and one slope. The mine produces an average of 18,415 tons of coal per day from four continuous miner sections and two longwall working sections. Coal is removed from the mine by diesel ramcars and longwall face conveyors, which discharge onto a series of conveyor belts to the slope bottom. The coal is then conveyed to the surface by the slope belt to the raw coal silos, and conveyed to the preparation plant for processing. The processed coal is then shipped by rail to customers.

Description of accident

On March 23, 1997, at about 7:00 am, the "B" crew, twelve-hour shift began its work duties. The crew, under the supervision of the longwall foreman, traveled to the North 6th East longwall working section to prepare for the day's activities of operating the longwall. The victim was assigned to work as a longwall stage loader operator and to assist a classified general inside laborer in building wooden cribs around the stage loader area. The other workers were assigned regular job duties along the longwall working face. The longwall foreman walked and examined the longwall face to the tailgate area, and then called the victim to start the stage loader and panline.

At about 8:20 am, the preshift examiner stated that he observed the victim and the general inside laborer breaking a chunk of coal at the stage loader, and then throwing the coal in the stage loader. At that time, the victim stated she was hot and wiped her brow. A short time later, the preshift examiner left the unit and did not have any further contact until they were told to bring the ambulance to the North 6th East longwall section.

The general inside laborer and the victim began building a crib just inby the master controller, in the 6th East Headgate Entry. The general inside laborer stated that while he was retrieving more crib material from the crosscut, the victim walked out of the crosscut toward the stage loader, but he did not know which way she had turned. A short time later he noticed that the stage loader had stopped and he went to investigate. Upon reaching the stage loader he looked toward the face area, noticed nothing wrong, and tried to reset the emulsion computer. When the emulsion computer would not reset, he looked outby along the North side of the master controller and saw the victim covered by a collapsed coal and rock rib. He immediately climbed on top of the controller and could see only part of the victim's head, hard hat, and left hand. He was unable to get a response from the victim, and called for help from the people on the longwall face.

The longwall shield operator was the first to arrive and immediately saw the seriousness of the situation. The rest of the crew, consisting of three longwall shearer operators, a longwall repairman, and the longwall foreman arrived a short time later and began recovery operations. The longwall foreman instructed the general inside laborer to retrieve the stretcher and first aid supplies, and sent one of the shearer operators to call for an ambulance and alert the mine manager and mine control of the serious accident. The crew continued extrication procedures by breaking the massive rock with sledgehammers and using a come-a-long to pull a portion of the rock away from the victim. The longwall foreman stated that he attempted to give mouth to mouth resuscitation, but was unable to reach the victim due to the amount of material on her body and the close proximity of the controller. He tried on several occasions to find a pulse, but could find no signs of life. The longwall foreman stated that after the rock was removed from the victim, she still could not be moved due to being covered from the waist down by more material. After about 30 minutes, the victim was uncovered, removed and placed on a stretcher. Because of the extent of her injuries, the victim was covered and placed on the unit mantrip for the ride out of the mine. The mine manager, a trained EMT who had been alerted of the accident, met the mantrip five crosscuts from the accident scene. He immediately got onto the mantrip and began assessing the extent of the victim's injuries. He continued to check for vital signs all the way out of the mine, even stopping the mantrip on two occasions to check for faint signs of life, with none being detected.

After arriving at the surface, the county ambulance service took over care. They decided it would be best to treat the victim while en route to the hospital. The attending physician pronounced the victim dead on arrival.

Conclusion

The accident occurred because the ribs in the area where the stage loader operator works around the 6th East Longwall Stage Loader were not supported or otherwise controlled to protect the stage loader operator. A rib collapsed, crushing the stage loader operator against the longwall stage loader master controller.

Edited from an MSHA accident report by Fred Bigio.

Arrangement of vehicles, curtain contributed to electrician's death

An electrical trainee was killed at an underground coal mine in Ala., because a mantrip was parked where drivers of other vehicles could not see it and because the victim put himself in a bad spot, MSHA investigators said.

MSHA issued a safeguard to the mine requiring that all rubber-tired mobile equipment be parked at least 30 feet from ventilation curtains or flypads through which other vehicles might emerge.

On the morning of March 5, the victim was crushed against the rib by the mantrip. He had crawled into a tight spot between the mantrip and the rib to ask a question of electricians on the other side of the vehicle.

Miners had just hung a check curtain outby the parked mantrip. The driver of a scoop, which carried plaster for a permanent stopping, came through the curtain and felt a bump. The scoop hit the mantrip, sliding the mantrip back about two feet into the rib. The rear bumper of the mantrip caught the victim in the chest. Miners and paramedics attempted to revive the victim as he was transported to the surface, but the Shelby County coroner pronounced him dead at the surface.

MSHA investigators concluded that the victim had positioned himself in the confined area while taking the shortest route from one side of the mantrip to the other. The practice of parking rubber-tired mobile equipment in the travelways of entries and the practice of installing curtains close to the corners of pillars, which obstructed visibility in these areas, contributed to the accident.

MSHA investigators found no deficiencies in the diesel Alpha Services Inc. mantrip or the Long-Airdox battery scoop that would have contributed to the accident. They found the roof and rib to be in good condition and the roadway to be dry.

This report was issued through MSHA District 11 in Birmingham, Ala. Michael Lawless is the district manager.

MSHA adopts interim policy for Metal/Nonmetal noise and air sampling

MSHA announced July 1 that it is adopting an interim sampling policy for airborne contaminants and noise for metal and nonmetal mines.

MSHA said it wants inspectors to focus in areas where there is reasonable likelihood that overexposures exist:

• Inspectors should therefore focus their sampling in the areas and on occupations where any of the following criteria apply:

• There is a history of overexposure. "Overexposure" means sample results that exceed the Threshold Limit Value (TLV) or short-term exposure limit (STEL) without regard to the error factor.

• The operation produces ground silica, cristobalite, industrial sand, asbestos, mercury, lead, cadmium, or other contaminants that require proper work practices and maintenance of controls to ensure compliance.

• The ore/mineral processing procedure uses chemicals that may present a hazard if improperly used or released. Some examples are cyanide, ammonia, and acids.

• Visual observation indicates the absence of engineering controls, engineering controls that are in poor repair or have damaged or missing parts, or engineering controls are present but not in use or are not being used properly. For example, mobile equipment, including drills, is used without cabs or have cabs without climate control systems. Also, review "P" action code designation areas to be sure engineering or administrative controls are in place.

• Conditions observed indicate a reasonable likelihood of potential overexposure, such as visible dust in suspension, dust accumulations on workplace surfaces, high noise levels, leakage or spillage of potentially hazardous materials, required or recommended use of personal protective equipment, or strong odors or eye irritation.

• Other serious health hazards are determined.

MSHA also said that the miner within each occupation and area likely to experience the greatest exposure should always be sampled and that personal full-shift exposure samples should be taken.

For additional information contact: Metal and Nonmetal Mine Safety and Health, Division of Health Gene E. Autio, (703) 235-8307.

Summer brings tragedy to child and teens in separate accidents

Over a two-week period in July, an 11-year-old died at a sand and gravel operation and a 16- and an 18-year-old died at abandoned quarries that are used as swimming holes.

The 11-year-old was playing with another friend on July 1 at a sand and gravel site in Neb., after the company had shut down the operation for the day. He and his friend were sliding down a stockpile when he came into contact with an energized powerline. MSHA's metal/nonmetal office reported that it was less than 3 feet from the nearest point on the stockpile to the electrical line, and that the company, at a minimum, was in violation of National Electrical Code standards.

A 16-year-old Missouri youth drowned July 3 after diving about 50 feet from a cliff at an old water-filled quarry. Witnesses report that the victim hit flat on the water and apparently was knocked out and sank. His body was found in 24 feet of water. This death was the fourth in 13 years at this site.

On June 28, Wisconsin authorities recovered the body of a teenager who drowned in a quarry. The 18-year-old was swimming with a friend when he disappeared in a quarry June 25th. The friend went for help after unsuccessfully trying to locate the victim.

Fishing teens get stuck in gravel pit

Two Maine teenagers fishing in a gravel pit misjudged the stability of the pit walls July 8 and ended up stuck in muck—one up to his hips, the other up to his neck.

"I thought we were going to die," one of the 14-year-olds told reporters. "I was really scared. I almost began saying my prayers." The two had headed out for a simple summer day of fishing at the gravel pit at about 11:30 am.

The pit has existed for years alongside the Sebasticook but has been excavated recently as part of an expansion project for a golf course.

According to the local police chief, the construction work has created a dangerous situation where the walls of the pit are 20 feet high and unstable. As the pit is being filled in, he said, the bottom of the pit is turning into mud.

"It's just like quicksand down there," he said.

The two teenagers were walking along the edge of the pit when they cast their lines into the water.

"All of sudden, [name withheld] slipped and I went to grab him," the youth said. "The rocks just kept falling out from under our feet. Then we were in the water. It was about up to my stomach, but [name withheld] was up to his neck. My first thought was 'We're going to die' [name withheld] was yelling and screaming for help," he said.

One of the teens said the water, sand and gravel combined to make a heavy mud that prevented him from moving toward the pit's edge.

"It felt like it was pulling me back down and that I was sinking," he said. "I was very scared."

One of the teens said the gravel continued slowly to fall into the pit, and he was afraid they would be buried. "I managed to get to the side and kept yelling to [name withheld] to come to me," he said.

Just before noon, a nearby resident reported to police that he could hear boys screaming for help from the pit.

At first, fire and rescue personnel believed the boys were drowning in either the pit or the nearby river, and the Fire Department rescue boat was dispatched.

There was also confusion about just which pit was the scene of the emergency as another pit exists about a quarter-mile north on the same road.

Emery said that by the time rescuers arrived, the two boys had managed to crawl out of the mud. "They weren't hurt," he said, "but they were pretty scared."

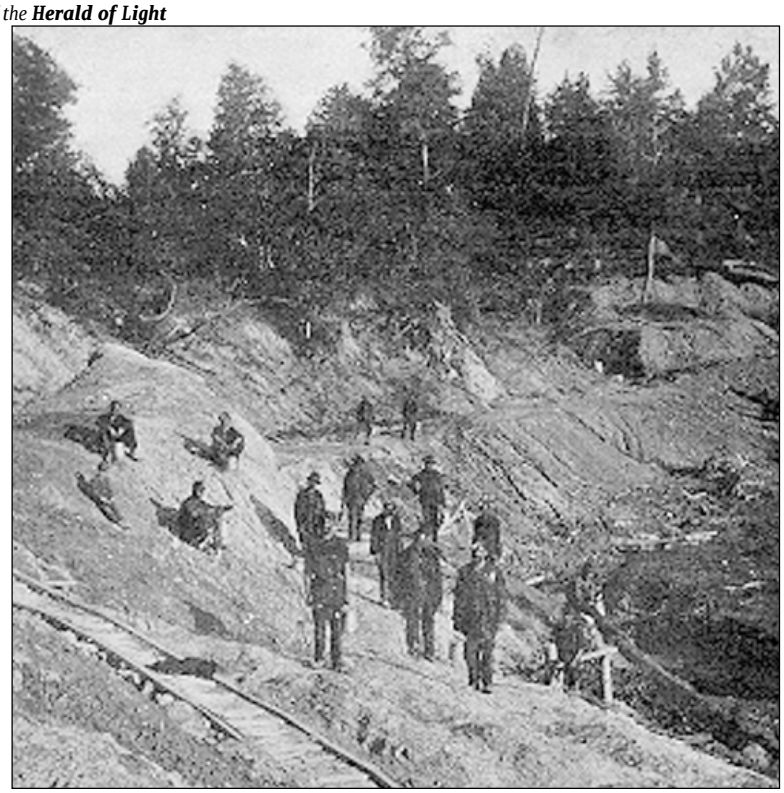
"The whole thing took seven minutes," the chief said, pleased at the fast response of rescue and fire personnel. When the call was received, two police officers, a state trooper, a local ambulance service, and half a dozen firefighters rushed to the scene.

The police have asked the landowner to post the area and possibly fence it off until construction is complete.

MSHA is planning on investigating to see if the gravel pit comes under agency jurisdiction.

Among the coal-miners

By Margaret Blake Robinson, New York, Editor of the ***Herald of Light***



◀ ***Miners at the noon hour.***

One summer day, when the temperature was so many degrees above zero that I was becoming skeptical as to whether there really ever was a zero, I stopped and rang the bell at a little house in a mining town in Illinois. A man came to the door smoking a comfortable looking old cob pipe and holding a well-thumbed Bible in his hand. He was small of stature, with coal black hair, well-tanned skin, intelligent features, and a pronounced English accent. I announced that I was holding evangelistic services in the little Methodist church a few blocks away, and that I would like to have him come to some of them.

"It's rather hot to preach and visit," he said; "but, then, I like the visiting preacher. I tell you if it was not for a preacher who visited me, I would be still a drunken miner—as bad as the rest of them."

Then he told me his story. It was not strikingly novel, but it gave me a new light into the hearts and lives of a class of people that I had almost come to believe were as incapable of being made spiritually white as was the coal they mined. His father had been a Methodist clergyman in England and his grandfather a local preacher ("a loaferin' preacher," as his little boy phrased it), and he himself had had a good education and religious training. He came to New York City when he was twenty one, and after vainly seeking employment in the more "genteel " occupations, he turned his face to the West and soon became a coal miner.

"Talk about the man with the hoe and the brother to the ox," he said, " well, the poor ox can't always choose his relations, but if he could, I believe he'd have cut me dead. I made good wages, but the bad influences of the mine and the saloon, which is as much to the average miner as his dinner, soon set their mark upon me. I married a good wife, but neither she nor our children could save me from my evil habits. One day a preacher called. He was not good looking (say, wife, do you remember the red carrot head and the pug nose on that fellow?)—he looked like a small edition of John L. Sullivan—but I tell yon he knew his Bible, and he was a friendly sort of a chap that you couldn't get mad at. I told him that it was none of his business whether I was a Christian or no, and said a lot of other things of the same kind, but he hooked me all the same. I gave up drink, and then I joined the Church. Now I help to pay the preacher, and I bought this house, and am paying for it little by little, so that my wife and children will have a home if anything should happen to me."

With great pride he showed me the little English garden in the rear of the house, and his wife, who was a Swede, said in broken English, but with such feeling in her voice that it was positively musical: " He's good von year now, an' 'tish like Hefen; but, oh! de udder poor miners' wifes. Oh" (going over and putting her arm on his shoulder), " my Art'ur is chanshed so—he is so goot, so very goot!"

Arthur seemed to like that sort of treatment, and lit his pipe afresh.

Within a radius of ten miles of Danville there are several mining-towns, Westville and Kellyville being the most prominent. The men who live at a distance from the mines go to work every morning in a railroad car especially run for them by the

mining company. It is a dirty, grimy car, inhabited temporarily by as dirty looking a lot of men as can be found outside the realm of "Dusty Rhodes" and " Weary Walker." Every man of them carries his pipe—a dude with a cigarette would be ridiculed in Polish, Swedish, Russian, and murdered English, and would probably be compelled (like chimneys in the East) to consume his own smoke. It seems as if every man's ambition is to have a pipe more disreputable looking than those of his neighbors, and when all are smoking in concert it is difficult to tell on which end of the train is the engine. The same scene is repeated in the evening, and a rush is made for the saloon the moment the railway car door is opened and its coal smeared passengers are back from their day's toil in the bowels of the earth.

"'Tis mighty easy to preach temperance," said a Westville miner, discussing the saloon question and the miner one day, "but it's the only decent place we fellows have to go. We have a newspaper to read, another fellow to argue with, and we can put our feet on the table and eat all the free lunch we want. We have a blooming fine fiddler who plays for us—say, wot's a fellow livin' for—all work? Some of us ain't got no wives, and them that has—oh, say! Story books is all right for love stories, but I've seen enough of that sort o' lousiness among the miners, an' I know better'n blamin' the fellows wot doll's go home."

I might moralize with that man, but he had hard, sad facts for my theories. I could only think: "God knows it all, but the wealthy city churches do not want to know it." If they did they would reduce the salaries of their pastors and the amount of their own luxuries, and send some strong-limbed, earnest, noble young fellows out here to do for the miners what the Y.M.C.A. has done for the railroad men, only to do it better by making the atmosphere more free and easy, and to pay more real attention to the spiritual work. It will take years of lectures and paintings and classical music to educate a man up to the point where he winces at his beloved scratchy fiddle and objects to have paint stores that are prodigal of their colors supply his artistic needs; but get that man truly "in tune with the Infinite," and he will reach out after the noblest and best as naturally and instinctively as a child seeks for its milk bottle.

"I never saw a converted tramp who did not take to washing himself and buying decent clothes and patronizing the book stores," said a Christian worker to me recently. A man has to be convinced that what you have is better and more to be enjoyed and coveted than what he has before he will want an exchange.

Westville is a small village of less than a thousand inhabitants, but it has sixteen saloons—there is an awfully dead sameness about the place; dirt, squalor, and the houses all shaped alike, of the same size, fashioned according to the same utilitarian and unartistic principles, and all owned by the mine owners. Since the formation of a miners' union the men only work eight hours a day and receive fair wages. The miners (those who dig for the coal) average about $2.50 a day, while the rock men, timbermen, cagers, and trackmen get about $2.10. Accidents are so frequent that a miner's wife said to me: "A natural death is such a strange thing here that when one hears that So-and-So is dead, they ask at once, 'When was he killed?'"

This being true, it would seem that there would be a leaning to religious things among the men, but, on the contrary, they become so inured to danger that the fear of death has no terrors for them—they live in the midst of it; it is a common visitor, almost as well known as the time keeper and cashier who appear with their accounts every week. Added terrors and added proofs of a final reckoning do not save men. "If they hear not Moses and the prophets, neither will they be persuaded if one rose from the dead," is as good an argument as it ever was.

Womanhood is degraded in the mining communities. A large proportion drink, and the worst examples of absolute human depravity ever forcibly or otherwise brought to my notice were two women and a man who rode on the train, near me, from Danville to Westville. Their language and actions bespoke unspeakable degradation, and I never realized until then how a woman could become so besmirched within and without and so befouled that onlookers would long for a spiritual Board of Health to remove the filth.

"The city has nothing as bad as this," said a young woman who was traveling with me, and who had worked in the slums of Chicago. The city civilization and refinement modifies its sin, but in a country mining town these elements are lacking, and the sin speaks its native language and uncovers its face in the midst of its fellows. A public school, an occasional local preacher, and a formal church service offer what spiritual aid they can for the miners, but little permanent good seems to be done. Some of the women and a smaller number of the men are truly desirous of better things, and only a changed personal environment will bring them. A few strong Christian men and their wives who would do personal work among the men, live among them, and open places to which they could resort, so as to break the dull monotony of work, would do more good shall by any other agency and method. The true reformer must be an individual seeker, and his "personal work" must not consist merely in teaching, but must also be full of brotherly sympathy, free from bigotry and cant, ready to concede a point often, willing to be patient, ready to look at things from the other man's point of view, and full of the love

◀ *A group of miners' children.*

such as Jesus had when He had compassion on the multitudes. Nor is it only the coal miners that need the light of the Gospel. The spirit of recklessness and the lack of moral character that pervades the coal pit finds its way into the iron, copper, gold, and silver mines too. A Colorado woman, speaking of the mines, told me that most miners who lived in and around El Dora "knew religion mostly as a help to express themselves when they got mad." This terse remark contains a sad and universally acknowledged truth for those who have visited the average mining camp.

However the coal strikes are settled, I know that I will in future see more in the flame of the winter coal fire than science or the newspapers say is there. May you, too, see there the crying need of these workers in the heart of the earth for the riches of the everlasting Gospel of Jesus Christ. Work and pray that the Lord of Harvest send forth sowers and reapers into His harvest.

Scanned from Missionary Review 1902, Vol. 25, pp. 835-39.

Exploring prohibited areas can turn deadly for thrill seekers

Last month, the body of a 23-year old Guerneville, California woman was found at the base of an abandoned mercury mine. She apparently was walking alone in the rugged area and lost her footing at the top of a 200-foot ravine.

In Jonestown, Penn., a 20-year-old man broke his arm and suffered facial cuts as he fell 60 feet down an abandoned coal mine shaft while hiking with several friends.

An 18-year-old boy from Goochland, Va.,—who hours before had been recognized during an awards assembly at school—drowned during a celebratory swim with friends at a private quarry.

As warm weather settles upon the nation, the urge to explore forbidden areas becomes even more irresistible. According to the U.S. Department of Labor's Mine Safety and Health Administration, dozens of people are injured and killed each year from accidents that occur at inactive underground mines, sinkholes, pits and quarries.

"There are a multitude of reasons to steer clear of these places," said J. Davitt McAteer, assistant labor secretary for mine safety and health. "Abandoned mines often have unsupported roofs that can collapse without warning, and harmful gases such as methane and hydrogen sulfide can overcome people very quickly."

Sand and gravel operations that shut down pits and quarries often leave behind old, unusable equipment. "People who swim in these prohibited areas run the risk of getting tangled in barbed wire or a chain-link fence, or may cut themselves on sharp glass," added McAteer.

Quarries can be deceptively deep, and the unexpectedly cold temperature of the water can lead to cramping, incapacitating even the most experienced swimmer.

In spite of mine companies' efforts to seal off mine-shaft openings or backfill the shaft with concrete, these measures aren't always foolproof. "The 'No Trespassing' signs are posted for a reason," said McAteer. "If we can make people aware of the potential dangers, hopefully they will seek their thrills elsewhere."

From an MSHA press release dated 17 June 1998. For further information contact Amy Louviere of MSHA's Office of Information at 703-235-1452.

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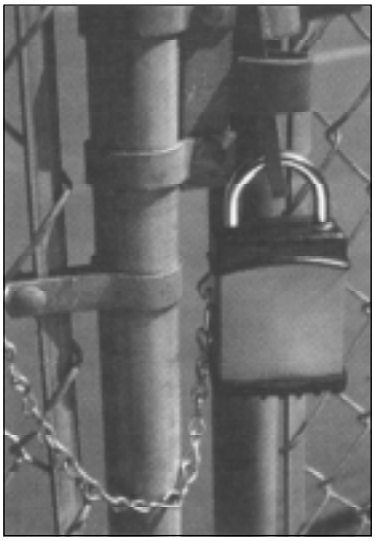
Electronic padlock solution to confined space safety controls

By Stanley R. Earnshaw, Director Industrial Products Div., Supra Products

Permit Required Confined Space—"controls entry such that only authorized personnel may enter a confined space." Or does it?



In 1993, when OSHA initiated the 29 CFR 1910.146 rule governing confined space entry procedures, it took a giant step forward in preventing industrial accidents. It was estimated that more than 50 fatalities and more than 5,000 lost work days could be prevented through adherence to these guidelines. Unlike many other types of industrial accidents, confined space injuries are almost always serious and often fatal. In addition to the personal trauma suffered, the company or organization is put in a highly liable position.

Utilizing new technology, there is now an opportunity to take safety initiatives to the next level.

Safety vs. conventional access control

When we think of safety programs, we usually think of training and procedures targeted at those whose jobs necessitate entry into confined spaces or other potentially hazardous areas. But what about other individuals, who, for whatever reason, gain access to potentially hazardous environments. It could be a contractor, someone from another department, a person not familiar with the dangers of the environment, or someone from outside the company or organization—possibly a disgruntled employee.

Is there a way to prevent an unauthorized and/or unqualified person from entering such hazardous areas as utility tunnels, holding tanks, bins, pits, silos, liquid reservoirs, high voltage access sites and machine rooms? And, what about areas not subject to confined space regulations but are equally as dangerous; such as holding ponds, construction sites, overhead access ways such as catwalks, or storage compounds containing potentially hazardous chemicals?

While many companies do not secure these areas and trust that those who enter will be qualified, others have implemented various forms of locking devices. In leaving hazardous areas unsecured, lives are being put at risk and with litigation increasing, corporations are accepting exposure to greater liabilities. The use of conventional locking mechanisms does improve safety and security but also poses key control dilemmas. Does one re-key when employees leave or are transferred? Are there unauthorized duplicate keys in circulation? Where have the keys gone that can no longer be accounted for? Who is actually entering a particular site and when?

Until recently, traditional access control solutions have proven inadequate. While being excellent for certain locations, card systems are not practical for safety applications because of the requirement for power and data lines, nor are they cost effective. Standard mechanical padlocks have no access tracking capability and can present major key control issues. Combination locks can easily be passed from person to person resulting in virtually no control.

Technology combines access control with activity tracking

New developments in access control technology now offer the security and safety of a conventional lock while additionally identifying who made the access and when, without requirements for external power cables or telephone lines. Utilizing patented technology initially developed for the real estate market and widely used in the wireless communication market, Supra Products of Salem, Or, has set a new standard with the recent release of the world's first electronic recording industrial padlock.

Known as the TRAC-Padlock, the product is operated by a pager-sized device called the TRACkey. The

padlock's industrial design and environmental specifications enable it to be used indoors or outdoors wherever access control is required. With the TRAC-Padlock, a report can be generated that flags whether or not a particular padlock has been re-locked since the padlock tracks each activity as open' or closed.'

The TRACkey provides the power to open the padlock and to record any access transactions. With no external power requirements, batteries in the lock to maintain, or connections to phone lines, the product is easy to install and is highly transportable should access needs change. The electronic key records its own access activity by location, date and time. Similar information is also stored in the lock. There is added security because the electronic key can be programmed to expire at management-defined intervals. This means that managers can easily maintain or eliminate key holders from the system.

In operation, a user enters a personal identification number into the electronic key and inserts the key into the padlock. After validating that the user is authorized, the electronic padlock opens.

For additional information, contact Supra Products Inc., 2611 Pringle Rd. SE, Box 3167, Salem, OR 97302-0167, 503/581-9101, 800/547-0252, FAX: 503/364-1285, www.supra products.com

Reprinted from the May 1998 issue of the Rimbach Publishing Co.'s ***Industrial Hygiene News.***

MSHA's Pittsburgh Tech Center holds open house

Along with two other federal agencies, MSHA's Pittsburgh Safety and Health Technology Center in Pittsburgh, Pa. held an Open House on May 15, 16, and 18. The purpose of the Open House was to inform and demonstrate to the public the important work being done to advance miners' safety and health. Over 60 MSHA staff participated in the event, demonstrating "Accoustic Illusions", Electrical Shock , Respirable Dust Sampling, Mobile Gas Laboratory, Dust Explosibility, Physical Testing of Roof Bolts, Impoundment Safety, Mine Emergency Response and a Mine Rescue Operations.

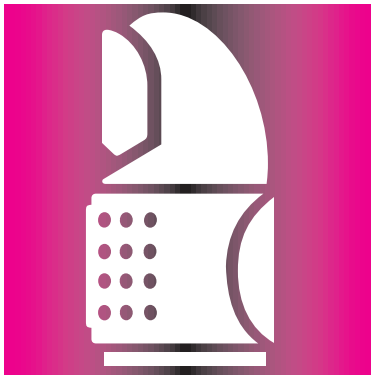
May 15 was designated as SCHOOL DAY with 550 students from 14 Middle/High Schools throughout Western Pennsylvania attending. Students with an interest in science from grades 6 through 12 were invited; questions pertaining to the demonstrations were numerous and the students were eager to participate in hands-on activities.

Saturday, May 16 was open to the public and about 1,000 visitors toured the MSHA Technology Center. The visitors expressed amazement that such technical resources were available from MSHA and that so few people know of the work being done at the MSHA Technology Center.

Monday, May 18 was Employee Day to provide an opportunity for the staff who worked the Open House to tour the various demonstrations, in particular, those from the other federal agencies.

The 1998 Pittsburgh Safety and Health Technology Center Open House was the sixth event of its kind the personnel organized by MSHA staff. Publicity for the event included a joint news release submitted to all area newspapers, TV and radio stations, a 5-day outdoor advertisement at the area's busiest 5-way intersection, and posters displayed at roadway intersections in the area.

URL www.msha.gov [Accessed 16 July 1998]



FIRST AID Mouth-to-mouth resuscitation

Before you can begin mouth-to-mouth resuscitation, you must be sure the person's airway is clear. If the person does not begin breathing once the airway is clear, perform mouth-to-mouth resuscitation.

To begin mouth-to-mouth resuscitation, position the victim so you can check for breathing by laying the person on his or her back on a flat, firm surface. Place yourself next to the person's neck and shoulders. Extend the person's neck gently, and open the mouth and airway by lifting the chin.

To determine whether the victim is breathing, place your ear above the person's mouth and listen for the sounds of inhaling or exhaling. Feel for air against your cheek and watch for motion in the victim's chest.

If the victim is not breathing, begin mouth-to-mouth resuscitation immediately. Pinch the victim's nostrils closed with your thumb and forefinger. Take a deep breath, and make a seal around the victim's mouth with your mouth. Breathe slowly into the victim's mouth twice, checking to be sure the victim's chest rises each time you breathe. After the second breath, turn your head, listen for air leaving the victim's lungs and watch to see if the chest falls.

Next, check to see if the victim has a pulse. Place two fingers on the victim's carotid artery, just to the side of the Adam's apple, to feel for movement. If the artery is pulsating, continue mouth-to-mouth resuscitation in the same way, blowing a deep breath into the victim every 5 seconds—12 breaths every minute. If the artery is not pulsating, begin cardiopulmonary resuscitation (CPR).

Continue to breathe for the person until he or she breathes on his or her own or until professional medical help arrives.

Reprinted from the Mayo Foundation for Medical Education and Research—1997.

FIRST AID Cardiopulmonary resuscitation

Cardiopulmonary resuscitation (CPR) is used in a range of emergencies, including heart attack, choking, and drowning. In these situations, the person is unconscious and has stopped breathing. Before you begin CPR on anyone, however, you should call for immediate medical assistance. The most effective way to learn CPR is by enrolling in a class sponsored by the American Heart Association or the American Red Cross.

The goal of CPR is to restore circulation. If you are unable to find a pulse in an unconscious person, heart compression is necessary to restore circulation. These compressions must be coordinated with mouth-to-mouth resuscitation: the breathing delivers air to the lungs; heart massage pumps the oxygenated blood to the brain and other parts of the body.

To begin CPR, place yourself at right angles to the person's chest. Find the base of the breastbone at the center of the chest where the ribs form a V. Position the heel of one hand on the chest immediately above the V; with the other hand, grasp the first hand from above, intertwining the fingers. Shift your weight forward and upward so that your shoulders are over your hands; straighten your arms and lock your elbows.

To begin pumping the heart, shift your weight onto your hands to depress the person's chest 1-1/2 to 2 inches. Compress the chest 15 times in a slow, even rhythm. After 15 compressions, breathe for the person twice. Establish a regular rhythm of compressing and breathing, counting aloud. If help does not arrive in 1 minute and a phone is readily available, call for an ambulance immediately—then resume CPR.

Reprinted from the Mayo Foundation for Medical Education and Research—1997.

YOUR FITNESS
Tips for avoiding (and treating) common fitness injuries

Summertime inspires MANY types of physical activity. Longer days give rise to running, walking, cycling and swimming for pleasure and fitness. "Weekend Warriors" come out to play softball and soccer. Injuries can stop you in your tracks.

"Most people who are injured while working out pushed themselves further than they should have, given their lack of physical conditioning," says Liz Neporent, M.A., president of Frontline Fitness in New York City and co-author of Fitness for Dummies. "The best way to prevent an injury is to get in shape gradually and not increase the intensity or length of your workout by more than 10% a week."

Using proper form when lifting weights, serving a tennis ball, or swimming also can help prevent injuries.

Neporent offers these suggestions for treating and preventing four common injuries.

Common-injury guide

• **Knee pain**. A torn ligament, tendon, muscle, or cartilage can cause knee pain. Overuse often causes such tears, as can a stumble or fall.

Simple knee pain can be treated with RICE (Rest, Ice, Compression and Elevation), but contact your primary care physician if pain persists or is intense.

To administer RICE: Rest an injured knee by staying off it; ice the injury for 15 to 20 minutes three or four times a day; compress it with an elastic bandage; and elevate the area slightly to reduce swelling. Contact your primary care physician if pain persists after 48 hours.

Cross training can help prevent knee injuries if the activities you choose stress your knees in different ways. For example: You can walk, bicycle and strength-train on alternate days.

• Shinsplints. "You can develop shinsplints or shin pain by doing too much exercise too soon or by making a significant change in your workout, such as running on a beach if you usually run on asphalt, or by wearing a new pair of athletic shoes for a long walk or workout," Neporent says.

You can prevent many fitness injuries by getting in shape gradually and NOT doing too much exercise too soon.

• You can relieve shinsplint pain by not working out for several days and by massaging the painful area with ice for 4 to 5 minutes, three or four times a day. Build your time and intensity gradually when you resume exercising.

• You can prevent shinsplints by replacing your athletic shoes before the cushioning wears out and by strengthening your shin muscles by doing shin exercises three or four times a week.

• Here's one to try: Stand with your weight distributed evenly over your feet, then lift and lower the toes and the ball of one foot 20 to 30 times. Repeat with the other foot.

• Achilles tendinitis. Your Achilles tendon may be injured if the back of your heel is swollen, sore and inflamed. A short, tight calf muscle usually causes the problem.

• To relieve your pain, rest and ice the area and don't do any stretching or strengthening exercises that put pressure on your heel.

• You can prevent the injury by regularly stretching your foot, calf and hamstring muscles. "Women should avoid high heels, because they can shorten the calf muscle and bring on the condition," Neporent says. "However, if they have Achilles tendinitis, wearing high heels can relieve the pain in the short-term."

• Rotator-cuff injuries. The most common shoulder injuries involve the rotator cuff, a group of four muscles that help hold the upper-arm bone in its socket. You may have injured your rotator cuff if you feel pain when you raise your hand, lift your arm to the side or throw or catch a ball.

• This injury usually is caused by repetitive shoulder movements, such as those performed when you swim or play baseball or tennis, or by a weakness in one of the rotator-cuff muscles. Treat the injury with RICE.

• You can prevent the injury by using proper form when participating in fitness activities and by following a reasonable training schedule.

Reprinted from the Summer 1997 issue of The George Washington University Health Plan's ***Vital Signs.***

THE LAST WORD…

One day a space shuttle crashed to the ground in the yard of a pre school. When he finally struggled out of the wreckage, the astronaut shouted, "I'm free! I'm free!!!" At this point, one of the little children surrounding him shouted back, "Big deal, I'm four!"

A heavy snowstorm closed the schools in one town. When the children returned to school a few days later, one grade school teacher asked her students whether they had used the time away from school constructively. "I sure did, teacher," one little girl replied. "I just prayed for more snow."

A mother told her young son to go to bed and be sure to say his prayers and ask for help to make him a good boy. The boy's father, passing by the bedroom, overheard his son praying: "And make me a good boy if You can; and if You can't, don't worry about it, 'cause I'm having fun the way I am."

A Sunday School teacher asked her class, "Does anyone here know what we mean by sins of omission?" A small girl replied: "Aren't those the sins we should have committed, but didn't?"

A little boy went to the store with his grandmother and on the way home, he was looking at the things she had purchased. He found a package of panty hose and began to sound out the words "QUEEN SIZE." He then turned to his grandmother and exclaimed, "Look Grandma, You wear the same size as our waterbed!"

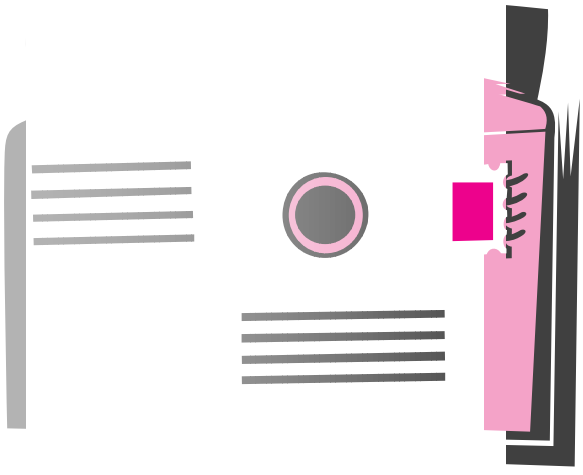
NOTICE: We welcome any materials that you submit to the Holmes Safety Association Bulletin. For more information visit the MSHA Home Page at www.msha.gov. We **DESPERATELY** need color photographs suitable for use on the front cover of the ***Bulletin.*** We cannot guarantee that they will be published, 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 1998 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 any 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.

Please phone us at (703-235-1400).



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*We are short of articles on metal/quarry safety and welcome **any** materials that you submit to the Holmes Safety Association Bulletin. We **DESPERATELY NEED** color photographs (8" x 10" glossy prints are preferred however, color negatives are acceptable—we will make the enlargements) for our covers. We **ALSO NEED** color or black and white photographs of general mining operations—underground or surface. We cannot guarantee that they will be published. If they are, we will credit the contributor(s) within the magazine. All submissions will be returned unless indicated.*

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- ***Sep. 7-11, 4th International Conference on Land Reclamation, E. Midlands Conference Center, Nottingham, England***
- ***Sep. 22-24, Safety, Health, and Environmental Conference, Charleston Civic Center, Charleston, WV***
- ***Sep. 24-25, Illinois Mining Institute 106th Annual Meeting/Exhibit, Gateway Convention Center, Collinsville, IL***
- ***Oct. 8-10, Kentucky Coal Assoc. Annual Meeting, Marriott Griffin Gate Resort, Lexington, KY***