



BULLETIN

August 1996

INSIDE:

*Independent contractors
PDMI breaks record
Satisfying the customer
Know your limits*

contents:

Independent contractor employment and accident trends in coal mining	1
Developing an effective safety training plan	5
Accident report: Man squeezed against timber set	5
Mining coal 24 hours a day, 365 days a year	6
PDMI breaks world tonnage record... SAFELY	8
Committed to safe construction	9
Satisfying the customer in a big way... ..	10
Danger in and around mines; bins, hoppers, and stockpiles	13
Make it a double	13
Southern Mine Rescue Association annual contest	14
Two mines win safety records	14
New mine fire containment barriers	15
Southwestern regional mine rescue contest	15
MSHA issues warning about trespassing in abandoned mines	16
Coal operator to use old acid mine as drainage showcase	16
The importance of respiratory protection programs	17
Know your limits	20
Poison ivy: Stay out of the woods	21
Food confusion: Why is it so hard to figure out what to eat	22

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

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

THIS MONTH'S COVER: Once again, thanks to A. Scott Gordon of Luck Stone Corp. at the Fairfax Plant in Centreville, Va., for this photo of "...a welder working from a manlift during construction of an enclosed screening tower. All screening facilities at the Luck Stone Fairfax Plant are enclosed to combat noise pollution and to help prevent airborne dust from entering the nearby communities."

**KEEP US IN CIRCULATION
PASS US ALONG**

Independent contractor accident trends in the coal mining industry

By Lynn L. Rethi, Training research specialist and Barbara Fotta, Research methodologist
U.S. Department of Energy, Pittsburgh Research Center, Pittsburgh, PA.

Recent employment figures (taken from the Mine Safety and Health Administration's database) indicate that the number of independent contractor¹ employees working in the coal mining industry has doubled over the past ten years. As their numbers increase, they become a more visible segment of the industry.

1); 13% were electrical accidents; and 9% were machinery accidents. Combined, these three accident classifications accounted for 69% of all coal mine independent contractor fatalities.

Information taken from fatality data is an important piece of the safety puzzle; however, other variables

and injury information.

The following coal industry data sites specific and present trends of independent contractor employees working in underground locations at coal mines, surface areas of underground coal mines, surface coal mines, and preparation plants. The data compares employment and accidents for time periods at the beginning and the end of a ten-year span from 1985 to 1994. Because the number of incidents involving independent contractors in certain accident categories during any one year may be small, three-year totals are used; the first three years (1985-87) of the ten-year period are compared with the last three years (1992-94).

Table 1.—Independent contractor coal fatalities, 1990-1994

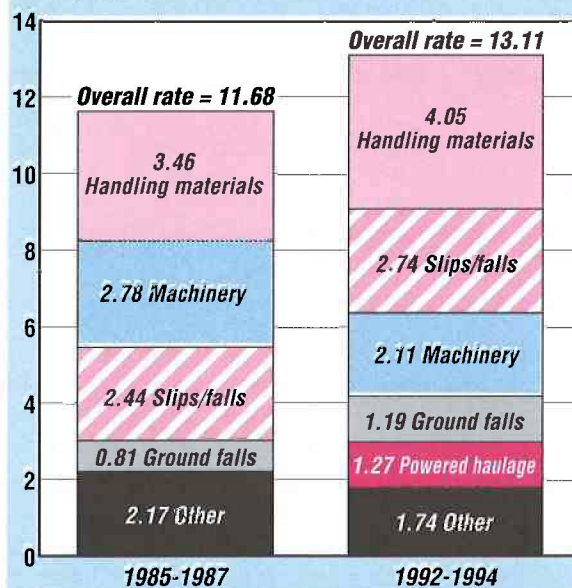
Accident type	Number	Percent	Cumulative percent
Powered haulage	21	47	47
Electrical	6	13	60
Machinery	4	9	69
Falling material	3	7	76
Ignition/explosion	3	7	83
Slips/falls	2	4	87
Explosives	2	4	91
Other	4	9	100
TOTAL	45	100	100

Increased exposure to mining hazards has also brought an increase in the number of fatalities involving independent contractor workers. One gauge that is traditionally used to evaluate the overall safety of an entity is the "number of fatalities." Over the five-year period from 1985-89, 27 independent contractor employees were fatally injured while working on coal mine property. This number increased to 45 fatalities during the subsequent five-year period from 1990-94. Nearly half of these fatalities (47%) were due to accidents involving powered haulage (See Table

injury data is necessary before deciding what approach should be used to improve safety. In order to implement appropriate safety strategies, it is important for safety practitioners to examine all available lost time accident

need to be examined in order to better define contributing factors associated with accidents. More specifically, information on trends in fatal and nonfatal accident and

Figure 1.—Independent contractor lost-day accident rates* at underground locations of underground coal mines



* Accidents per 200,000 employee-hours exposure

Underground locations at coal mines

In underground coal mining, independent contractor employee hours increased by 176% (from 2.9 to eight million hours) from 1985-87 to 1992-94 (See Table 2). These hours represented 0.7% of all underground coal mining employee hours in 1985-87 and 2.5% of all underground employee hours in 1992-94. Although no fatalities occurred in either time period, lost

accidents which occurred during the two time periods are displayed in Figure 1. Contributing to the increase in the overall rate is a substantial rise in the rate of occurrence for powered haulage accidents which increased from 0.34 (included in 'Other') during 1992-94 to 1.27 during 1992-94. Rates for the accident classifications of handling materials, slips and falls, and ground falls have also increased, while the rate of machinery accidents has

classified under about 20 different underground job titles. From 1992-94, they were classified under about 40 different job titles. For example, during 1985-87, there were no injured independent contractor workers classified as section foremen or belt men. Roof bolters and utility men accounted for less than 3% of the injured workers. However, during 1992-94 section foremen, utility men, belt men, and roof bolters accounted for about 12% of the injured workers.

Table 2.—Number and proportion of employee-hours, accidents, and fatalities accounted for by independent contractors working in coal mining

Mining location	Years	Employee-hours		Accidents ¹		Fatalities	
		Number ²	Percent of all hours	Number & rate ³	Percent of all accidents	Number & rate ³	Percent of all fatalities
Underground mines	1985-87	2.9	0.7	172 11.68	0.8	0 0	0
	1992-94	8.0	2.5	527 13.11	2.9	0 0	0
Surface area of underground mines	1985-87	7.3	13.3	78 2.13	5.1	4 0.11	18.2
	1992-94	16.1	34.4	161 2.00	12.3	5 0.06	55.6
Surface mines	1985-87	23.7	6.9	303 2.56	6.1	7 0.06	14.6
	1992-94	42.6	15.4	476 2.23	11.5	19 0.09	45.2
Preparation plants	1985-87	9.3	8.7	260 5.60	11.2	1 0.02	6.3
	1992-94	17.9	19.1	270 3.02	12.6	7 0.08	53.8

¹ Accidents include injuries resulting in either permanent disabilities or lost workdays or both, but excludes injuries resulting only in days of restricted work activity.

² Employee-hours are reported in millions of hours.

³ Rates (in bold-italics) are computed as the number of accidents or fatalities per 200,000 employee-hours

day accidents for independent contractor workers increased from 172 to 527 which corresponds to an increase in the overall lost day accident rate (number of accidents per 200,000 employee hours) from 11.68 to 13.11.

Individual accident rates for the most frequently occurring types of

declined.

The scope of the work being performed underground by independent contractor workers appears to have expanded judging by the increase in the number of job classifications reported for injured workers. From 1985-87, injured independent contractor workers were

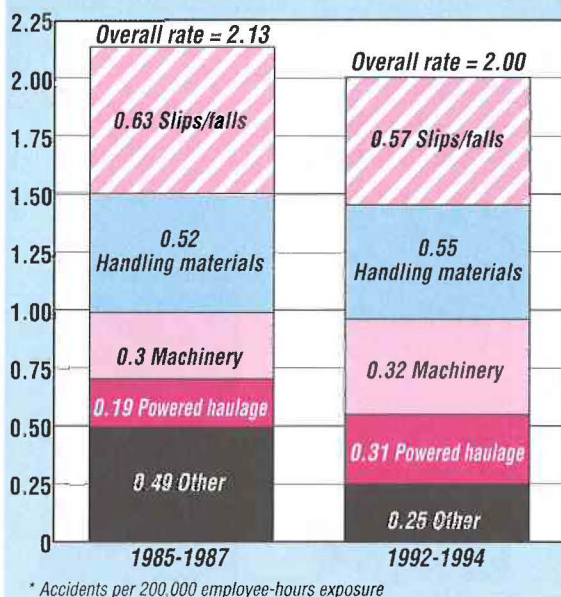
56%) were independent contractor employees. Although the number of lost day accidents increased from 78 to 161, the overall accident rate decreased slightly from 2.13 to 2.00 accidents per 200,000 employee hours.

A breakdown by type of accident (See Figure 2) indicates that

Surface locations of underground coal mines

At surface locations of underground coal mines, employee hours of independent contractor workers increased by 120% from 1985-87 to 1992-94. These hours accounted for 34.4% of the total hours reported for this mining location during 1992-94 (See Table 2). Of the nine fatalities that occurred at the surface locations of underground mines from 1992-94, five (or

Figure 2.—Independent contractor lost-day accident rates* at surface locations of underground coal mines



accidents due to slips and falls, handling materials, and machinery have occurred at about the same rate during both time periods. However, the rate of occurrence of powered haulage accidents has increased by more than 50% from 0.19 (1985-87) to 0.31 (1992-94). Additionally, while truck drivers accounted for 9% (seven out of 78) of the independent contractors injured from 1985-87, they accounted for 22% (35 out of 161) of the injured workers during 1992-94.

Surface coal mines

At surface coal mines, employee hours of independent contractor workers increased by 80% over the past 10 years. The 42.6 million employees' hours reported during 1992-94 accounted for 15.4% of all employee hours at surface mines (See Table 2). And while independent contractor employees comprised only 11.5% of the accidents which occurred at surface mines during 1992-94, they accounted for 45% of the fatalities (19 out of 39).

The overall lost day accident rate for independent contractors working at surface mines decreased slightly

(included in 'Other' from 1985-87) to .33 during 1992-94. This increase is reflected in the number of truck drivers being injured which increased from 26 (9% of the accidents) during 1985-87 to 88 (18% of the accidents) during 1992-94. On the other hand, welders, who accounted for 23% (70 out of 303) of the injured independent contractor workers in 1985-87, now account for only 12% (59 out of 476) of injured workers.

Preparation plants

At coal preparation plants, employee hours of independent contractor workers increased by 93% from 1985-87 to 1992-94. With 17.9 million employee hours reported during 1992-94, independent contractors accounted for about 19% of preparation plant employee hours (See Table 2). They also incurred more than half of the fatalities (seven out of 13) at preparation plants during this period. Despite a substantial increase in the fatality rate from .02 to .08, the overall accident rate for independent contractor workers at preparation plants

from 2.56 to 2.23. A breakdown by accident type (See Figure 3) shows substantial declines in the rates of handling materials and machinery accidents. However, the rates of accidents due to slips and falls, and powered haulage increased. In the case of the latter, the rate for powered haulage accidents more than doubled

decreased substantially, from 5.60 during 1985-87 to 3.02 during 1992-94.

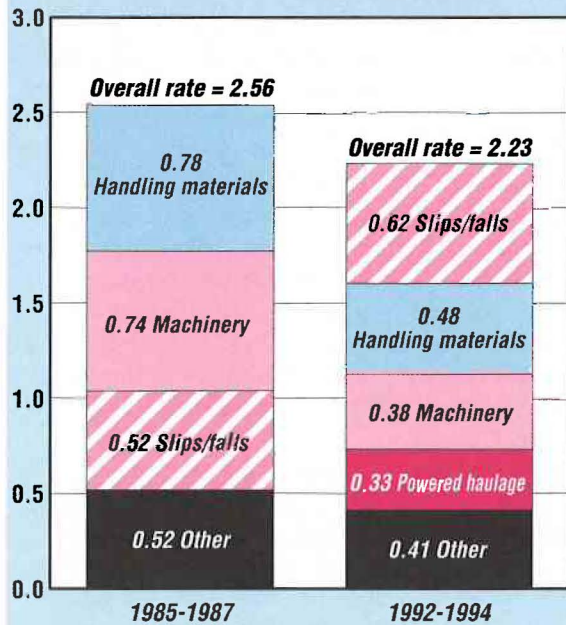
This decrease reflects large declines in the rates of accidents due to handling materials, slips and falls, and machinery (See Figure 4). Powered haulage accident rates have remained relatively unchanged. However, independent contractor employees classified as truck drivers, again, accounted for a greater proportion of the injured workers, increasing from 8% (20 out of 260) during 1985-87 to 19% (50 out of 270) during 1992-94.

Discussion

Over the past 10 years (1985-1994), U.S. coal production increased by 20% from 835 million tons to more than one billion tons. This growth included a 22% increase in surface production and a 15% increase in underground production. During the same interval, the number of both surface and underground mines decreased by about one-third. Similarly, the number of operator employee hours declined by about 39% at underground mines and about 33% at surface mines. However, the number of hours reported by independent contractor employees continues to increase throughout the coal mining industry. As their hours increase, independent contractor employees account for a greater proportion of both fatal and nonfatal accidents.

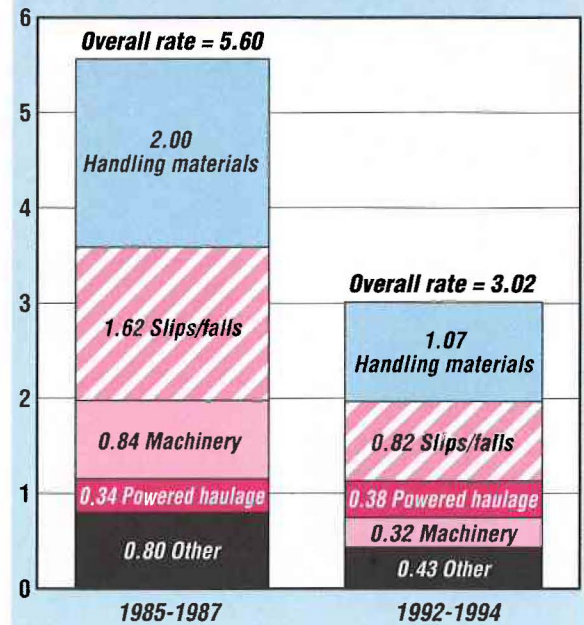
Powered haulage accidents are the leading cause of fatal injuries to independent contractor employees working in the coal industry. From 1990-1994, these accidents accounted for almost half of all independent contractor fatalities. Additionally, over the past ten years, increases in the rates of nonfatal powered haulage accidents were also observed for independent contractor employees working at both underground and surface mines. These increases are also reflected in the number and

Figure 3.—Independent contractor lost-day accident rates* at surface coal mines



* Accidents per 200,000 employee-hours exposure

Figure 4.—Independent contractor lost-day accident rates* at preparation plants



* Accidents per 200,000 employee-hours exposure

proportion of injured contractor workers in the job classification of truck drivers which more than doubled. Given these trends, safety interventions might be more effective if they include strategies that focus on the accident classification of powered haulage and the job classification of truck drivers.

Specific accident and injury data provides safety practitioners with information that can be used to develop effective safety intervention strategies. Trends identified in the preliminary analysis provide informa-

tion for developing a more focused approach. This preliminary analysis is only the first step in improving safety. Further research should be conducted to analyze independent contractor hazard exposure, level of training, and perception of risk as it relates to the performance of their jobs. Safety interventions, based on a clearer profile of independent contractors, should improve safety within this segment of the mining industry.

¹ Title 30 CFR, part 45, section 2c defines an independent contractor as: "any

person, partnership, corporation,...that contracts to perform services or construction at a mine." Mine operators employ independent contractors for a variety of production and support services. A sample of occupations include truck drivers, security guards, supervisors, technicians, equipment operators, mechanics, drillers and blasters, and construction workers. Although independent contractors are required to report annual hours worked on mine property to the Mine Health and Safety Administration (MSHA), they are not required to obtain an MSHA identification number. Consequently, the possibility exists that the number of independent contractor employee hours and accidents, while working on mine property, may be under reported.

Capsule news...

Coal production and consumption will hit all-time record levels by year-end, each exceeding 1 billion tons, according to National Mine Association's short-term coal forecast. Production in 1996 is expected to increase by 2.4% to a record 1.046 billion tons from 1995's estimated 1.021 billion tons. Production in the West will grow

nearly 5% to 504 million tons, topping the 500 million ton level for the first time. Production in the East will show only a small improvement over 1995 levels to total approximately 542 million tons. Total coal consumption—for domestic use and for export—is expected to grow to 1.050 billion tons by year-end, up from 1.033 billion tons in 1995. Coal for electricity generation remains the only domestic market to show an

increase, as coal use for coking and industrial purposes continues to be essentially flat. More than 80% of U.S. coal production is consumed by utilities and non-utility generators to produce power.

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

Developing an effective safety training plan

Presented by Robert E. Morgan, Mine Inspector, Division of Mineral Mining, Virginia Department of Mines, Minerals, and Energy at the 1995 Safety Seminars cosponsored by the Virginia Aggregates Association, Division of Mineral Mining, Mine Safety and Health Administration, on December 6-7, 1995 at the Sheraton Inn, Roanoke, and the Hyatt Hotel, Richmond, Va.

The old adage that "you only get out as much as you put in" is certainly applicable to mine safety training. To be effective, safety training must reflect not only the hazards and safe work procedures, but also the actual management procedures for assigning employees to various work assignments in the mine. This requires an in-depth assessment of diverse data that may include the following:

- employee selection/assignment policies

- existing levels of knowledge
- training expectations (goals/objectives)
- results of mine safety analysis

A training approach that seeks only to satisfy a government or company mandate without consideration of these factors is destined to produce a result equal to that input. All too often, safety training is viewed in the singular sense of satisfying a mandate imposed by company management or government. If training is carried out in this mind set, benefits will be minimal and the opportunity to improve both safety and production will have been lost. The organization that mandates a strict adherence to curricula that does not provide flexibility and constant updating is guilty of not subscribing to basic principles of

effective training.

In reality, training should be considered an integral part of a mine's productivity and profit potential. An accident that results in injury to employees or equipment effects the bottom line of the profit and loss statements. The mine operator who subscribes to high training standards that incorporate mine safety analysis, needs assessment, and thoughtful planning should see the benefits in reduced accidents, lower operating costs, and improved productivity.

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

ACCIDENT REPORT

Man squeezed against timber set

An experienced miner was taken out of the mine on a stretcher after he was caught between a moving battery locomotive and a timber set.

Three workers went looking for materials to use to unplug a chute. Two went ahead on foot, while the third followed later in a battery locomotive, moving very slowly because of poor visibility.

As the locomotive passed the two workers on foot, they climbed aboard. The vehicle was passing through an area with very little clearance. Two of the workers saw the third man's hard-hat fall off after it hit a low timber, and then what appeared to be his shoulder striking

a pipe that was hanging along the drift. Shortly afterwards he screamed and asked to be taken out.

The company's investigation showed the worker fractured his pelvic bone, apparently when he was caught between the side of the locomotive and the timber set in the drift. He had been standing in the cab beside the driver, with part of his body extending outside of the cab.

Although the injured worker was an experienced miner, he was unfamiliar with the area where the accident happened, and visibility was poor. After the accident, the company held a half-day training session for

all employees and contractors to reinforce the safety policies and procedures for locomotives. A subcommittee also determined that having more man-cars available and clearing congestion on the lines might deter similar incidents in the future. In response, the company ordered more man-cars and held a workplace-wide clean-up day to help clear congestion and get transportation systems operating safely and more efficiently.

Reprinted from the Nov./Dec. 1995 issue of Ontario, [Canada's] Natural Resources Safety Association's Health & Safety Resource.

6

Mining coal 24 hours a day, 365 days a year

Kerr-McGee Coal Corporation's Jacobs Ranch Mine, in Wyoming's Powder River Basin near Gillette, is the third largest coal mine in the nation. Roughly 20% of the national coal output is mined in the Powder River Basin.

In 1995, Jacobs Ranch employees produced 24.6 million tons of low-sulfur, sub-bituminous coal from two pits with multiple seams as much as 60 feet thick.

Jacobs Ranch has 365 employees and uses high-capacity, state-of-the-art mining equipment. The mining process begins when earth-moving scrapers remove the topsoil that supports vegetation. The topsoil is stored in berms until it is returned to the area during reclamation.

New 54-cubic yard shovels remove overburden in 80-ton bites and completely load 240-ton trucks in just three passes. Smaller shovels dig coal, using 40- and 50 cubic-yard buckets, and load the coal into 240-ton end-dump trucks for hauling the coal to the crushers. The average overburden-to-coal ratio is 2.5 BCY/ton. The overburden is tested before and during mining to identify and segregate any toxic or undesirable materials that could hamper revegetation or adversely affect groundwater. These materials are isolated well beneath the earth's surface and away from ground water.

As operations move forward, mined out areas are reclaimed immediately to minimize the size of the open area.

Topsoil is replaced on the contoured overburden area, spread, cultivated, seeded and protected from erosion. Varying combinations of up to 18 types of grass, shrubs and forb seeds are planted to replace the native forage. After reclamation, the land is in better condition than before mining, and new vegetation supports more

livestock.

Wildlife, too, find a better home on the reclaimed lands. Mine employees provide innovative features—mammal dens, burrowing owl dens and nesting boxes—to entice wildlife. Piles of boulders and rocks are placed on reclaimed areas to provide a vantage point for birds of prey and cover for small animals.

Jacobs Ranch Mine has been nationally recognized for its successful contemporaneous reclamation practices. Twice in six years, the mine received a national Award of Excellence in Surface Coal Mining Reclamation from the Department of Interior's Office of Surface Mining. These awards recognize 19 years of successful land reclamation and wildlife restoration.

Jacobs Ranch employees have permanently reclaimed over 2,400 acres of land—more than any other mine in the Powder River Basin. A herd of about 60 elk from the nearby Rochelle Hills have provided "user endorsement" by availing themselves of Jacobs Ranch's reclaimed lands for winter forage.

Another important milestone, and one critical to the future of Kerr-McGee Coal, was the renewal of the mine permit by the Wyoming Department of Environmental Quality. The permit allowed mining of a new federal coal

lease obtained in 1993. This 8-year extension of the life of the mine represents nearly \$ 1 billion dollars in State and regional economic benefits. Equally important, the new lease ensures that the company's employees will be able to produce coal well into the next century.

With current demand for coal, Kerr-McGee sees the need to begin the extended process of acquiring additional coal leases.

The State's share of the bonus bids over five years for the last round of leasing is a \$20 million-per-year windfall of new money. Effectively, this was like a 10% increase in coal royalty and tax revenues for five years. Despite the positive twenty-year demonstrated record of environmental accomplishments by coal mines in the Powder River Basin, some environmental groups continue to oppose coal leasing and coal mining.

At right: On top of a 55-foot thick coal seam, a loader fills a haul truck, while a six-story shovel on the pit floor scoops a 17-ton bit of Wyoming fuel.





in the range of \$3 to \$5 dollars per ton depending upon the Btu value of the coal. The 1995 average Wyoming coal price declined about 5% to \$6.35 per ton from the \$6.70 average in 1994. (The record high was \$12.75 in 1982.)

These declining prices are continuing to squeeze profit margins as well as royalty and tax revenues to the State. Some mines are responding by making additional capital investments in larger equipment to reduce mining costs. Some have bought additional coal leases so that high annual production can be maintained with its economy of scale. Jacobs Ranch is in the process of expanding its annual production capacity to 35 million tons by adding crushing and conveying equipment and preparing to bid for additional reserves, such as the Thundercloud Tract immediately west of the current mining operation. Basically, only the low-cost mines can compete.

Kerr-McGee is committed to improving productivity and lowering operating costs. The company expects to do this by fully utilizing existing operating capacity and through acquisition of new reserves.

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

One example of this is an environmental group who filed a complaint which delayed all Wyoming coal leasing over a year at a cost to the State of more than \$700,000 in lost interest. Ultimately, the courts ruled that the complaint was totally without merit and that the Bureau of Land Management was correct in issuing the coal leases. Wyoming could have lost the opportunity for excellent jobs in the coal mining industry.

Recent coal-leasing activity and increased coal production in the Basin is due to the Federal Clean Air Act Amendments of 1990. The legislature requires many eastern utilities to meet new air standards by purchasing emission credits, installing expensive scrubbers, or burning low sulfur coal. Powder River Basin low sulfur, or "compliance coal," is the choice for many utilities as "Clean Air Act" coal.

The Wyoming Coal Industry and the State of Wyoming are hoping to grow and benefit for many years from sustained increases in demand for coal.

Coal accounts for 56% of the U.S. electrical supply. Any increase in electric demand due to improved national or regional economic conditions quickly translates into new coal demand.

Kerr-McGee's existing customers, who have traditionally used compliance coal, have also increased purchases as electric demand has grown in their

service regions. This demand—concentrated in the Sunbelt states—may increase at a rate slightly higher than the national average, which is presently about 1% per year.

Jacobs Ranch ships coal to utilities in Oklahoma, Texas and Arkansas and has added markets in Georgia, Alabama and points east. As far as overseas markets, the low Btu coupled with high transportation costs continue to prevent significant exports from the region.

Total 1995 Wyoming coal production reached a record 264 million tons with about 94%, or 247 million tons, coming from the Powder River Basin.

Coal markets continue to be very competitive, with low spot coal prices



◀ Above left: Cowboys herd cattle on reclaimed mine property as a loaded coal train begins its journey.

◀ Left: An electric shovel dumps a load of overburden into the bed of a 240-ton haul truck at Jacobs Ranch Mine. Use of these trucks, the largest available to the industry, has increased productivity and efficiency.

PDMI breaks world tonnage record... safely

Planning, teamwork, and safety—three factors that played key roles in setting a world's record at Phelps Dodge Morenci, Inc.

It happened Sunday, May 26, 1996. In 24 hours, crews mined 1,327,800 tons of material. That exceeds the previous record (set at Escondida in Chile) by nearly a quarter of a million tons. The arithmetic works out to almost 1,000 tons per minute being mined. Mine Operations Manager Don Quinn said it was done on three normal shifts, involving about 1,000 people.

Those who participated agree that this kind of record is not set merely on a whim. Cliff Brooks, General Shift Supervisor and key organizer of the event, said, "Don Quinn had the vision to do this. "And then Mine Planning got involved, and surveyors, drilling and blasting crews, and "bulldozers worked

feverishly up there for about the last week. It was a team effort from a large group of people as far as a month in advance," Brooks added.

Blasting Supervisor Armon Pearson said, "The powder crew had a record day when they shot 520 holes on the 19th. That's about two million tons of broken material." Within the span of a week, blasting crews shot 2,170 holes (another local record), breaking about 8,600,000 tons of material. More than 3,000,000 pounds of explosives and 78 miles of detonating cord were used.

"A mine's ability to move tonnage is directly proportional to the number of trucks and the haulage profiles for those trucks," said Bruce Kennedy, Chief Mine Engineer. "In preparation for the day, all the departments worked together to coordinate equipment, manpower, broken inventory, haulage profiles and dump surface area."

Before going to work, every crew had a safety tailgate meeting. "If we had even one accident, [the] record just wouldn't mean anything. Every crew started the day focused on safety."

Haulage trucks numbered between 70 and 89 on the road at any given time during the three shifts. Fourteen shovels were operating. Twenty-two dozers worked "A" shift and 15 worked "C" shift (regular 12-hour shifts).



There were some minor mechanical problems, the kinds of things that occur in the course of any normal day. Tire Repair serviced two flats on haulage trucks. Mechanical/ Electrical repaired a broken cable on one shovel and a hoist blower on another. Some minor downtime occurred on the P-6 Conveyor and #1 Crusher. Mine Electrical Supervisor Charlie Jackson said, "Most everything ran good that day." Heavy Duty Garage even did scheduled PMs (preventive maintenance) on five haulage trucks.

Directly related to haulage, local records were set at In-Pit Crush and Convey. IPCC Supervisor Brad White reported 204,330 tons of crushed material traveled the beltline from mine to mill during the same 24-hour period—almost 20,000 tons more than the previous record.

Safety was the prime focus throughout the event. "Safe production is the name of the game," said Quinn. "An accident would have nullified everything else. As it is, this is like winning the World Series."

"Safety and production go together," added Safety Inspector Bob Torres. "It all comes back to employees living by the creed: 'If it's not safe, don't do it.'"

So who gets the lion's share of credit for this accomplishment?

"The employees," said Brooks. "The ones in the trenches doing the work. They're the ones who got pumped up and wanted to do this. We owe this record to them."

"It's everybody working together and helping each other out," reaffirmed Shovel and Drill Repair Foreman John Tysoe, with an eye on the future. "I look for PDMI to go for a million, five within a few months."

Reprinted from the June 1996 edition of Phelps Dodge Morenci's Copper Today.

Committed to safe construction

9

In our progressive world where complacency and relaxed attitudes towards corporate safety programs often spell disaster for otherwise healthy construction companies, CDK Contracting Co. of Farmington, N.M., has shown a remarkable ability to surge to the forefront of safe industrial construction.

Adopting a safety slogan of "Committed to Safe Construction", CDK has taken that commitment to new levels of excellence in an industry that has a reputation for being less than safe.

CDK was recently singled out for special recognition by Douglas K. Martin, Arizona's State Mine Inspector. This award was for logging over 500,000 hours of construction work in Arizona's mining industry over the past three years—without a single lost time accident. Coupled with a construction project in Rio Rancho, N.M., boasting a record in excess of two million hours of construction work over a five-year span without a single lost-time accident is evidence that CDK is indeed committed to safe construction.



CDK Contracting Company receives award from the Arizona State Mine Inspectors Office. Left-to-right Bill Smyth, Arizona Area Manager for CDK; Doug Martin, Arizona State Mine Inspector; and Larry McIntyre, CDK Safety Manager.

Safety recognition by industry leaders such as Air Products, Inc. and Kennecott Copper Corp. further reinforce CDK management's commitment to maintaining an aggressive company safety and loss control program. This program includes the following: a full time safety coordinator who oversees safety programs on all major projects; substance abuse testing as a prerequisite for all hires and transfers; comprehensive in-house training in all relevant facets of safety issues required by MSHA, OSHA, CAL OSHA, EPA, DOT, and site specific training as required.

CDK's safety program was formally adopted in 1988 by executive management and is under

the direction of Charlie Casey, Loss Control Manager and Larry McIntyre, Manager of Safety. The combined efforts of CDK's management team and all its employees have surpassed industry standards with impressive results evidenced by recordable and lost-time incident rates that are

substantially lower than the industry average.

Through development of an ever changing safety program sensitive to the demands of the current competitive construction market and the requirements of a varied industrial client base, CDK appears to have found a recipe for safety success with the ultimate goal of sending every employee home at the end of the work day safe and healthy.

CDK, a full disciplined heavy industrial contractor, is headquartered in Farmington, N.M., with area offices in Tucson, Ariz., Riverside, Cal., Henderson, Nev., Salt Lake City, Utah, and Wright, Wash.

Four West Virginia mines honored

Four West Virginia mines were among those honored by the Mine Safety and Health Administration for outstanding safety records. Elk Run Coal Co. Inc.'s Castle Mine in

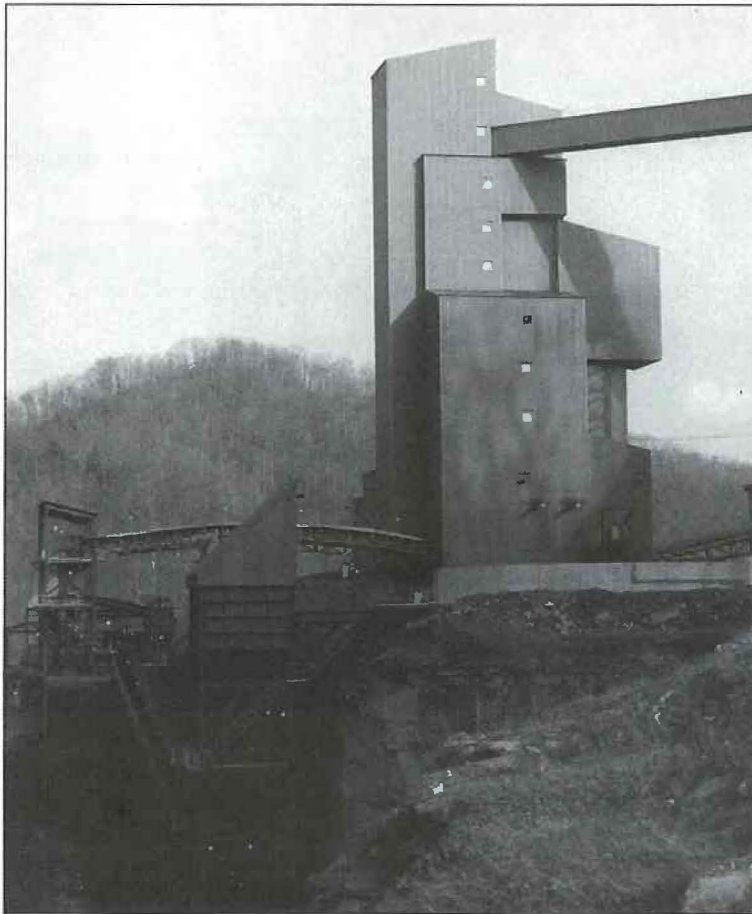
Sylvester was the only underground mine in the state to be cited. Three surface mines also were commended: Arch of West Virginia's Wylo Mine in Yolyn; Elkay Mining

Co.'s Tower Mountain Surface Mine in Lyburn, and Colony Bay Coal Co.'s surface mine in Wharton.

Awards are based on the most work hours without an injury that forced a worker to miss a day.

Reprinted from the August 10, 1996, edition of the Charleston Daily Mail.

The Premier-Elkhorn Preparation Plant located at Myra, KY, a division of TECO.



Coal preparation

Satisfying the customer ...in a BIG way

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

Far right, Richard Howard, Plant Superintendent, checks the computer that controls the thickener outside the prep plant.

COAL TODAY was privileged to tour the multi-million dollar Premier-Elkhorn preparation plant and loadout complex at Myra, Kentucky. We had one burning question: "Was there any new technology that this new plant has put into operation?" The answer surprised us.

The Premier-Elkhorn preparation plant, a subsidiary of Teco, processes 3.2 million raw tons of coal per year and produces about 2 million clean tons. Seven underground and six surface mines supply the raw material—all of which is hauled into

the complex—800 trucks a day! Each truck has an RF transmitter welded to the bed and when driven on the inbound weigh scale, a receiver transmits all the truck data—including where the coal comes from—to the scale house. Random sampling of the product from different mines is done and from that information, the trucks are directed to either of five stockpiles (total: 200,000 tons) that feed into the plant—or if clean enough, directly to one of five stockpiles (total: 400,000 tons), four of which lead to the train loadout. After unloading, the empty

trucks are weighed on the outbound scale to determine total tonnage. The train loadout can load 150 cars in four hours—up to 6,000 tons per hour. The coal is pulled to the Shelby railroad yard where it is diverted to various locations—the majority going to Southern Utilities. Premier-Elkhorn preparation plant and loadout can produce 26 different qualities of coal to satisfy the exacting requirements of any customer. Four stockpiles feed the loadout: 1. low-sulfur, coarse compliance coal; 2. compliance fines; 3. higher sulfur; and 4. high fusion, low iron coal. As the blended coal is conveyed to the loadout, a belt sweep retrieves a sample for ASTM on-the-spot spec testing.

The fifth dump site at the plant crushes coal and feeds the stoker stock piles. This is a high quality product in two different sizes, most of which is exported to Iceland for the silicon metal industry. These stockpiles are fed by the plant as well as by truck.

The plant will pay for itself in about twenty years and is expected to be in operation for 25-30 years depending on the coal market.

Our question was, "Is there any new technology?" The answer did indeed surprise us. With the exception of computerization, the answer was, "No." Rick Johnson,





it wasn't cost effective to save it and most buyers have a limit on the amount of fines included.

The medium and coarse reject is carried by belt to a hopper and trucked to an embankment. The fines reject are pumped into the embankment. The plant processes 700 tons per hour raw steam coal and 450 tons per hour stoker. That's 290,000 tons per month raw, 50-60% of which is clean. When Howard said they were planning an upgrade, he explained it wasn't new technology, just more equipment!

There is a total of 32 employed at the huge facility including scale and other outside employees—this on three shifts, two production and one maintenance. Howard commented that years ago, twenty men per shift was standard to work in the plant alone. In 1981, a large preparation plant in Corbin, Kentucky employed 125! But at the Premier-Elkhorn plant, only *two* men are required to run the entire operation.

How?

Computerization. In the past employees had to monitor and control each process in the three cleaning circuits, computers now do it. This is the big change in coal preparation.

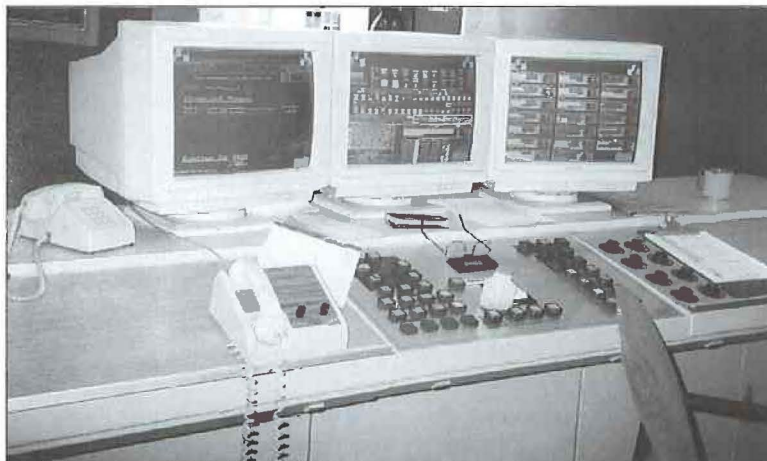
Computer monitors check the specific gravity of the medium (water and magnetite) to keep it between 1.3 and 1.5—the most efficient

Director of Operations, noted, "The key to staying in business is efficiency. There's really nothing new. We use the same methods that have been in use for the past twenty years." He explained that about twenty years ago, spirals were put into operation. They had already been in use in the precious metals industry.

I noticed a roof bolt plate lying on one of the feeder stockpiles and asked how the plant cleaned that up. Richard Howard, Plant Superintendent, pointed to a large electromagnet above the conveyor structure leading to the plant and a chute dropping down to a flatbed trailer full of ferrous material.

Howard then took *COAL TODAY* for a quick tour of the plant, beginning at the top where the raw coal is fed into the complex. Because gravity is the primary force in separation and drying, the cleaning process begins there.

As we crossed the catwalk to the top floor of the 214' high building, Howard explained that 50% of the coal came out of the coarse, 6 x 3/8 circuit (vessels), 35-40% came out of the medium, 3/8 x 28 mesh circuit (cyclones), and the remaining 10% out of the fine 28-100 mesh circuit (spirals). I wondered about the coal fines below 100 mesh. Howard said



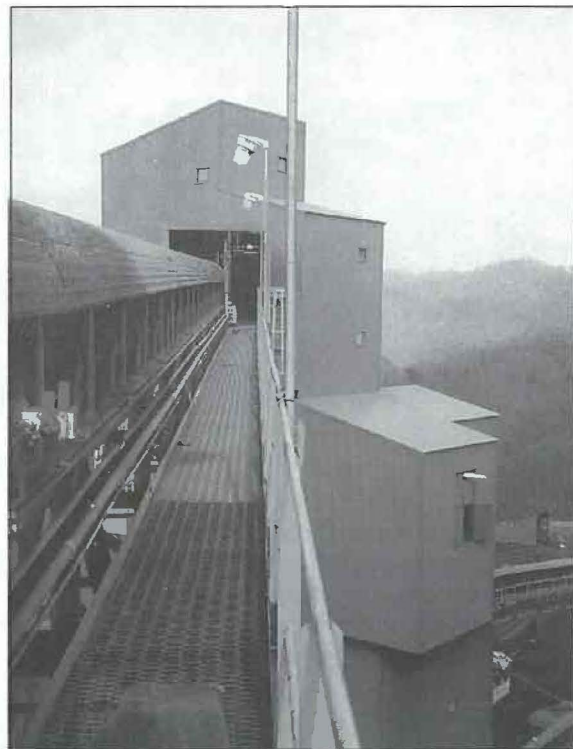
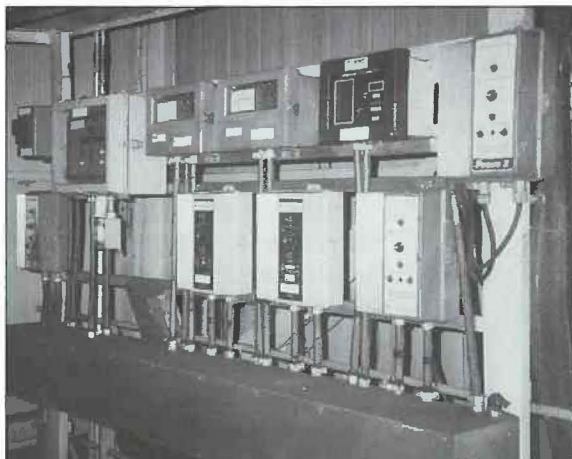
◀ At far left, a view of the stoker storage area from the top of the preparation plant.

◀ The main computer room shows what's going on in any part of the plant at any time. With the click of a mouse, a single operator can start up and shut down the entire facility.

12

At near right, the bank of monitors inside the prep plant that sends information to the main computer room.

At far right, a view from the top at the Premier-Elkhorn Preparation Plant.



specific gravity to allow coal to float or stay suspended and the rock to sink.

A tremendous amount of water is used in the cleaning process—9,000 gallons per minute. The water is cleaned and recycled—all controlled by computers. The addition of flocculent which speeds the gravitational separation of solids is controlled by computer. A computer controls the addition of sodium hydroxide to keep the pH between 6.8 and 6.9 to enhance the flocculent action. Seven-hundred gallons of water per minute is lost in the cleaning process. A computer

monitors this and adds what is needed to the recycled water to keep the plant going.

The final part of the tour was the main control room. One man sits in front of three computer monitors and can, with the touch of a button, stop the entire operation or part of the operation. He can also start up the plant, which is done every day, from the keypad.

This is truly an amazing technological complex providing a quality

product that Premier-Elkhorn and eastern Kentucky can be proud of.

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

CAPSULE NEWS... **Technology off the job...**

Health

Improved brain surgery via robot assistance is the hope of a new procedure being developed at NASA's Ames Research Center in Mountain View, Calif. A robotic probe will 'learn' the brain's characteristics by using neural net software, the same technology that helps focus camcorders. The probe, equipped with a tiny pressure sensor, will enter the brain, gently locating the edges of tumors while preventing damage to critical arteries. Brain tumors typically have a different density than normal brain tissue. This difference

allows neurosurgeons to find the tumor's edge through experience. Potentially, the robot will be able to 'feel' brain structures better than any human surgeon, making slow, very precise movements during an operation. If the probe hits an artery, it will stop before it penetrates, allowing the surgeon to make a decision as to what to do next. A modified form of the brain surgery robot could be used for other kinds of surgery. Ames is collaborating with Stanford University Medical Center and the Veterans Affairs Palo Alto Health Care System on the project.

A synthetic ankle joint is being readied for market. Developed by San

Diego-based Sparta's Bioengineering Advanced Material Products unit, the joint is made of composite materials and is stronger and lighter than traditional steel ankle joints. The National Rehabilitation Hospital in Washington, D.C. provided medical guidance and conducted clinical trials on the device. Sparta has several other devices in various stages. Clinical tests of orthodic knee joints are underway, with foot plates in the design stage. For more information, contact Moreno White at (619) 455-1650.

Reprinted from the Sept. '96 issue of Automation News Network's Industry.Net Report of Pittsburgh, Pa.

Danger in and around mines: bins, hoppers, and stockpiles

Bins and Hoppers of loose materials are common in the mining industry. Accidents involving loose materials typically bury the worker when the materials give way under the worker or fall down on the worker.

Deaths in these accidents are usually caused by suffocation.

Serious hazard of entrapment

• A worker can be suffocated even if the worker's head is free of and above the loose materials.

When the worker exhales, the materials can close in more tightly around the chest, making it impossible to breathe in and out.

• Granulated free flowing material such as sand is a dangerous

environment to work around.

- A draw point that is clogged or bridged can appear to be safe.
- Bins and hoppers can be deceptive; the center of the materials have the potential to give way at any second. When it does give way, the materials move quickly and leave no time for the worker to react.
- A lifeline cannot always be depended upon to rescue a miner. If the materials are in a free flowing state, the weight of the materials will impede the rescue.
- A worker covered only by materials from the waist down can still be trapped. It is almost impossible to forcefully pull a worker out of free flowing materials.

First aid

- Assess the situation while simultaneously making sure the worker can breathe.
- Be very careful when removing the worker from the materials; avoid abrupt movements.
- Protect the worker from the granular materials with shoring or a barrel.
- Administer artificial respiration if needed and treat for shock. Time is of importance. However, first aiders and rescue workers must be aware of the hazards around them and protect themselves from possible entrapment.

Source: Bin and Hopper Safety Awareness Program, U.S. Department of Labor, March 1988, MSHA.

Make it a double

A unique electrolytic cell developed by the U.S. Bureau of Mines (USBM) is providing a flexible tool for processing primary metals and recycling scrap.

The new cell features a double-membrane configuration that keeps solutions at the anode separate from those at the cathode. The membranes prevent the mixing that occurs in conventional cells.

"Our cell offers tremendous versatility because you can have a completely different electrolyte on each side of the membrane," explained USBM scientist Lorin Redden. "It opens up processing routes that produce less waste and use less energy."

For example, conventional scrap recycling operations use large amounts of chemicals to dissolve scrap. These high chemical demands result in significant quantities of

chemical waste. With the double membrane cell, you can significantly reduce costly chemical addition and the associated waste generation.

In the new procedure, the scrap is dissolved electrolytically on one side of the cell at the anode. Hydrometallurgical techniques separate that solution into single-metal solutions. Solid metal of high purity is recovered from those solutions at the cathode on the other side of the cell. The same electrical energy supports both reactions (scrap dissolution and metal production), making the new technology more efficient than conventional approaches.

USBM scientists recently tested a commercial-scale prototype of the new cell at a scrap/waste processing plant in southern Utah. The prototype, which recovered cobalt metal from cobalt solution, produced a

better cobalt product and was much more efficient than the plant's existing electrowinning circuit.

"We believe that the cell can efficiently recycle leaded brass and other metal scrap," Redden said.

Scientists have also explored primary production applications. One study recovered copper, nickel, and platinum-group metals from a matte material.

Recent laboratory tests looked at using the cell to produce stannous sulfate chemical from tin metal. Based on that work, an Eastern chemical company is testing a similarly designed cell at one of its processing plants.

Reprinted from the May 1995 issue of the U.S. Department of Interior's Bureau of Mines' TIPSHEET—Mineral news and features—Office of Public Information, 810 Seventh St., N.W., Washington, D.C. 20241.

Southern Mine Rescue Assoc. annual contest

A mine rescue, benchman's, and first aid contest was held at the shrimp festival building and grounds in Delcambre, La., May 3-4, 1996. The contest consisted of a field problem, first aid problem, bench problem, 25-question written test, 10-question written gas test and 20-question benchman's written test. Thirteen teams participated in the contest trying to solve the problem: "How to find and remove 22 men who are missing underground after a gas ignition knocked out the mine ventilation system and filled the mine and exhaust system with smoke."

The team had to enter the mine through a decline to the 750 level where they found clear air at the bottom of the shaft. In checking a crosscut at 2 drift they found water running into the 1,000-foot level shaft. As the team checked each crosscut and room they found a 300-lb. fire extinguisher in 3 drift past a crosscut and a fissure in the floor in B-1 crosscut was emitting explosive gases and a five-foot flame. The fire could be extinguished but, extinguishing the fire would allow explosive gases to accumulate in the mine atmosphere. Teams that put the fire out were docked as an additional fire and ignition source for methane was later found in 2 drift past C crosscut. While this was happening water levels in the mine continued to rise.

The time underground was

limited and time to find and escape the mine with any survivors was severely limited. The survivors were located in D-1 heading under a fresh air ventilation raise. Fifteen miners were in good condition and one had burns on the face, hands, and legs. After first aid treatment, the rescue teams had to determine how they could safely remove these 16 miners in the presence of dangerous quantities of gas. This proved to be the challenge of the day as with time running out **none** of the teams were able to rescue the 16 survivors.

The winning team had 232 docks—the highest number of docks was 551.5.

Comments by a number of mine rescue participants indicated it was one of the best problems they had ever been exposed too.

The Field Competition winners were: First place was won by the Homestake Gold Team from Lead, S. Dak., Bruce Allard, Team Captain. Second place was won by the Wipp (Westinghouse) Blue Team from Carlsbad, N. Mex., Gary Kessler, Team Captain. Third place was won by AKZO Nobel Salt #2, Salty Cajuns from Avery Island, La., Glenn Meyers, Team Captain. Fourth place was won by Morton Salt Blue, Weeks Island, La., Henry Charpentier, Team Captain. Fifth place was won by the Homestake Silver Team, Lead, S. Dak., Jim Wieser, Team Captain.

The trophies were handed out at the banquet by Tom Lloyd, Field Office Supervisor, Albuquerque, N.M., Chief Judge, Felix Quintana, Assistant District Manager, Dallas, Tex., and Mike Turner, from the National Office Staff, Arlington, Va.

The first aid contest was written and coordinated by Jim Murray from the University of Texas. The trophies were awarded by Jim from the local ambulance service. Tied for first place was the Homestake Gold Team and the Wipp Blue Team. Second place was won by the United Salt Corp. of Houston, Tex., Keith Schurmann Team Captain. Third place was won by AKZO Nobel Salt's "Salty Cajuns."

The Benchman's contest was conducted by the National Mine Service Co. The contest was won by, Tom Regan of the Homestake Mining Co.; second place was won by Joe Bacca Wipp Westinghouse; and third place was won by Walt Bryant, Jr., Morton Salt Co., Grand Saline, Tex.

Joel Garhard of The National Mine Service Co., Indiana Pa., headed up the team of judges and handed out trophies at the banquet.

Members from the MSHA South Central District, thank Mr. Lonnie Badeaux, president of the Southern Mine Rescue Assoc.

*Whitey Jacobson, Safety Specialist,
Dallas, Tex.*

Two mines win safety records

The Colowyo Mine in Meeker and The Big Island Mine and Refinery in Green River, Wyo., were among eight mining operations recently honored

for their strong safety records by the National Mining Association and the U.S. Department of Labor's Mine Safety and Health Administration. The

mines received "Sentinels of Safety" awards for their 1995 safety records. To qualify; a company had to compile at least 30,000 employee work-hours during the year without a fatality or a lost-time injury.

*Reprinted from the August 10, 1996,
edition of The Denver Post.*

New mine fire containment barriers

Mine fires are a persistent and costly problem associated with abandoned mines. Digging out and quenching a waste bank mine fire is the most effective method of eliminating the fire. However, this method is also the most expensive in terms of both labor and equipment. Furthermore, it is hazardous, and generally requires a large area to distribute the hot material for cooling. Another serious hazard

associated with digging out a mine fire is the unlimited oxygen made available to the burning coal. This results in an even larger fire. The Office of Surface Mining is looking at remote heat removal methods that will not require disruption of the burning mass. Injection of a cryogenic liquid into an area next to the fire causes the freezing of the area adjacent to the liquid, which results in greater flow of the

liquid horizontally into the fire area. A decrease in the temperature of the gasses associated with cryogenic injection results in the development of a cold pressure front, which moves through the mass to the surface. In laboratory tests, liquid nitrogen flowed into the burning mass and successfully quenched the fire.

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

Southwestern regional mine rescue contest

The 14th annual MSHA Southwestern regional mine rescue and first aid contest was conducted at the Riverwalk Field in Carlsbad, N.M., April 18-19, 1996. The contest included a problem, written bench test, 25-question written examination, 10-question gas test, and a first aid test. The field problem average time was 114 minutes.

Eight teams tried to enter a mine that had just had an ignition of methane caused by an undercutter cutting into an old sealed oil well. Three men were missing with one known to be sealed in a tool crib. On arriving at the head of 4 crosscut, a reading of 4.5% methane was noted and a nonpermissible fan was operating recirculating smoke and methane gas through the vent bag to 3 room in 4 crosscut. Enroute to the face of 4 crosscut an out of control fire was noted. There was also a body lying on a 480 volt power cable that had to be moved before the stopping could be constructed. To accomplish this the electric power to the drill had to be shut off at the control panel. Teams then barricaded the fire.

At the end of the crosscut in room 3 they found the undercutter and 8.5% methane and 12% Oxygen with 4,500 ppm of carbon monoxide. The only way to remove the 2 men holed up in the stopping at the end of the crosscut

was to remove the gas from the front of the tool crib's door way. Some teams tried to remove the miners by building a stopping in front of the tool crib. This was not the solution. To properly remove the 2 miners, one of whom had third-degree burns on his face and hands, the two auxiliary fans placed at 3 and 4 crosscuts had to be shut down and the curtain in 2 crosscut closed. As the mine had only natural ventilation, the main fan which has been repaired turned on. By moving the vent bag from the 3 crosscut fan to the 4 crosscut fan, fresh air could be moved in front of the stopping and the gases diluted to allow entry into the sealed area.

First place in the field competition was won by the Wipp Blue team from the Westinghouse Operation, Carlsbad, N.M., Gary Kessler, Team Captain. Second place was won by the Wipp Silver team, Billy Beeman, Team Captain. Third place was won by Solvey Minerals of Green River Wyo., Mark Wight, Team Captain. Fourth place was won by IMC Global of Carlsbad, Joe Parker, Team Captain. Fifth place was won by Western AG Minerals of Carlsbad, David Penick, Team Captain.

Bud Narramore from the MSHA National Office and Charles Sisk from the Dallas district office presented the trophies at the banquet.

The first aid contest was conducted by Desi Appodaca and Gilbert Miera, New Mexico state mine inspectors. First place went to Western AG Minerals—Chris Onsurez, team captain. Second place to Mississippi Potash Inc.—Jon Mendez, team captain. Third place to Wipp Silver—Beverly Wasson, team captain.

Appodaca and Miera presented the trophies at the banquet.

The benchmans contest was conducted by, and the trophies furnished by, the National Mine Service Co. First Place was won by Joe Bacca of Wipp Blue, Carlsbad, N.M. Second place was won by Jeff Jetmore from Solvey Minerals of Green River, Wyo. Third place was won by Fred Willet, from Wipp Silver, Carlsbad, N.M. Steve Lipe, of the National Mine Service Company from the Scottsdale, Ariz. office and 4 additional National Mine Service employees presented the trophies at the banquet.

Members from the MSHA South Central District, thank Buddy Webb, President of the Mine Rescue Association and the Association members for allowing us to participate in this program.

Whitey Jacobson, E&F Specialist, MSHA, South Central District Office, Dallas, Tex.

MSHA issues warning about trespassing in abandoned mines

Last January, an 18-year-old man exploring an abandoned silver mine in Tooele County, Utah, plunged hundreds of feet down the mine's shaft. The man died almost instantly from massive leg and head trauma when he hit the bottom.

That same day, a Grand Junction, Colo., hiker died inside a long-abandoned coal mine after he apparently was overcome by toxic gas.

And last June, a 39-year-old man drowned while swimming in an abandoned quarry in Mecklenburg, Va. He and two children had trespassed by climbing a fence surrounding the quarry.

Each year, unsuspecting explorers, recreationalists, and pets wander into inactive mines, sinkholes, pits, and quarries. According to the Labor Department's Mine Safety and Health Administration (MSHA), dozens of people and animals are killed or injured each year on abandoned mine sites.

"These tragic deaths underscore the danger of entering abandoned mines and quarries," said J. Davitt McAteer, assistant labor secretary for mine safety and health. Companies that shut down pits and quarries often leave behind old equipment. "An unsuspecting swimmer may find himself tangled up in barbed wire or a chain-link fence," he said.

Abandoned underground mines harbor other kinds of dangers. "Noxious gases such as methane and hydrogen sulfide can overcome people quickly, and unsupported roofs can collapse without warning," said McAteer.

Some mine-shaft openings are sealed by creating a cement wall or backfilling the shaft with concrete. Mine companies often place warning signs or weld gates to the opening. These measures aren't foolproof, however. There's still a major problem with vandalism," said McAteer.

According to MSHA, the growing

urbanization of rural areas, population growth, greater residential development, and easier access to formerly remote areas have increased exposure to abandoned mine sites. This has significantly raised the potential for more incidents and disasters.

The Department of Interior's Office of Surface Mining (OSM) also has taken steps to educate people about the prevailing dangers. OSM has produced several television public service announcements (PSAs) warning people to steer clear of abandoned mines. For further information on these PSAs, contact the OSM Office of Communications at (202) 208-2719.

*U.S. Department of Labor
Office of Information
Philadelphia, Pa. 19104
Mine Safety and Health Administration
Contact: Rodney Brown
Office: (703) 235-1452*

Coal operator to use old acid mine as drainage showcase

Charleston, W.V.—A Morgantown coal mine operator plans to use an inactive, acidplagued Upshur County surface mine as a demonstration site for new technology designed to alleviate acid mine drainage.

John Faltis purchased the property located on the headwaters of the Buckhannon River. "We have the responsibility to continue to treat the water forever," Faltis said. "We think the water treatment system in place now is adequate to recover and treat to state standards the acid mine drainage that's taking place. But I want to take innovative new techniques and put them to work at

eliminating acid mine drainage at the source."

The property was mined by Enoxy Coal in the early 1980s. Acid mine drainage problems closed the mine in 1987. Enoxy, a joint venture between an Italian mining firm and Island Creek Coal Co., was cited dozens of times by state inspectors for allowing unlawful amounts of acid into a Buckhannon River tributary. The state pays more than \$300,000 a year to treat acid mine drainage at a nearby site operated by now-defunct DLM Mining.

No coal has been mined at the Enoxy site in eight years, but Enoxy's

parent companies have contracted with a 24-hour water treatment plant. A project Faltis is considering is using anoxic drains at the site. The drains channel acidic water through sealed pipes filled with acid-neutralizing limestone.

"Is it fixable? I think it is with long-term treatment," Faltis said. "Over the next 10 or 15 years, we should be able to reduce [acid mine drainage] at the site over 70 percent from what it is now."

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



The importance of respiratory protection programs

By: George F. Schorr, Industrial Hygienist—MSHA

Respiratory protection can be an effective means of reducing personal exposures to hazardous substances while engineering controls are being installed, repaired, or maintained. However, the effectiveness of respiratory protection to control

exposures to hazardous substances is greatly dependent on the development and administration of a practical respiratory protection program. Asking people to wear respiratory protection without providing proper training and procedural guidance can

inadvertently lead them into harmful situations. The wearer may know what the respirator is for, and know how to use it, but may not know how to properly maintain the respirator or inspect it for defects. Without guidance on the proper use, maintenance, and storage of respiratory protection, a respirator user may wear the respirator improperly, wear a damaged respirator and not know it, or wear the wrong respirator for the hazardous conditions encountered.

Just as the working condition and environments are different from mining operation to mining operation, needs for respiratory protection are also different. The respiratory protection needs of a mine that has only one or two employees exposed to only a single hazardous substance at a known concentration is far different than that of a mine that has many employees exposed to several hazardous substances with varying concentrations. Respiratory protection programs should reflect these individual differences and be tailored for the site where respiratory protection is needed. Canned respiratory protection programs that come off the shelf of a corporate office, trade organization or union hall may meet regulatory requirements but may do little to enhance the overall effectiveness of respiratory protection. The actual benefit of establishing a written respiratory protection program is not to comply with regulatory requirements but to ensure that the miner required to wear respiratory protection gets the maximum benefit from the respirator.

In order for a respiratory protection program to be effective, procedures that outline how the program is to be administered and managed need to be put into writing. Written respiratory protection programs provide continued guidance to the person administering the program and to persons required to wear respiratory protection. They will

The photo on this page and on page 18 were provided by Steve Lipe of National Mine Service, Inc., of Price, Utah. These images are a bit rough because they were scanned from printed matter and electronically despeckled to remove the background screen.

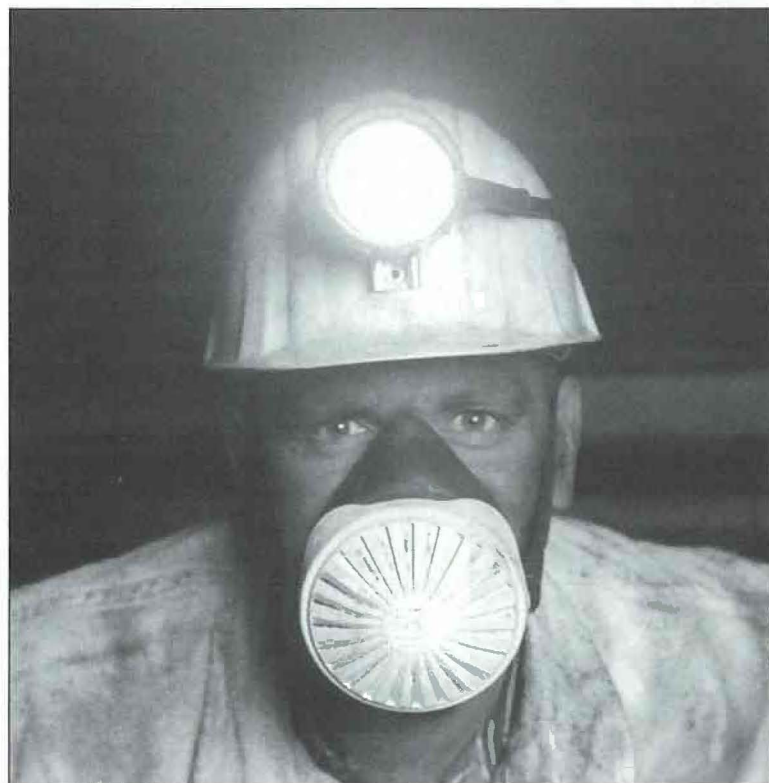
also help ensure that all the elements of the program are conducted properly and consistently. A written respiratory protection program should include procedures on how respirators are to be selected, fit tested, inspected, utilized, maintained, and stored. It is also worth noting that regulation, when respiratory protection is mandatory, may require a written respiratory protection program.

Procedures that establish proper selection criteria for respiratory protection are critical. If the wrong respirator is selected for the environmental conditions encountered, the wearer can be placed in harms way. Selection criteria procedures will establish what type of respirator is best for the environmental conditions encountered. If the exposure encountered is to only a few employees of a known concentration of a single hazardous material, the respirator selection criteria can be as simple as explaining why a specific type of respirator was selected. A more elaborate selection criteria scheme will be required if there are many employees exposed to diverse hazardous materials of varying concentration. The more variable the hazardous environment the more elaborate the respiratory protection selection criteria scheme may need to be.

Respirator fit test procedures or protocols should be part of any respiratory protection program. Respirators protect the respiratory system from hazardous airborne materials by reducing the amount of hazardous materials inhaled. This is accomplished by providing contaminant free air and isolating the respiratory system from the hazardous atmosphere. Contaminant free air is provided by either mechanical filtering systems or supplied air systems. These systems are rigorously tested to ensure that they will work. They are then certified and approved prior to being made available for

purchase. Isolation of the wearers respiratory system from the hazardous airborne materials is accomplished by the face to respirator seals. This facial seal allows the respirator to seal against the face and provides a barrier between the respiratory system and the hazardous atmosphere. If the facial seal is compromised for any reason, the wearers' respiratory system will be subjected to hazardous material

wearing respirators. Procedures that establish who can use respiratory protection will ensure that only persons that are authorized, knowledgeable, and physically capable of wearing respiratory protection are allowed to use it. Written procedures will also provide guidance and information to persons required to wear respirators on the type of respirator they will need and when they will need it. Breakthrough



present in the atmosphere. Testing the facial seal to ensure that an adequate fit can be made and maintained is as important as providing a respirator that is tested and certified.

Procedures that outline who needs respiratory protection, and how and when it is to be used, are also necessary. These procedures will help eliminate improper use of respiratory protection. Improper use of respiratory protection can not only be dangerous but can put undue stress on people not physically capable of

characteristics and limitations for the types of respirators that are used should also be included. This will help prevent respirators being used beyond their designed capacity. The specific needs of a mining operation will dictate how elaborate the procedure on use and limitation will need to be.

Proper storage, inspection and maintenance procedures should also be established as part of a respiratory protection program. Proper storage of respiratory protection will ensure that damage does not occur during

storage and that respirators are kept in usable condition. Routine inspection of respiratory protection will ensure that defects that can compromise the effectiveness of a respirator will be detected. Maintenance of respiratory protection will ensure that defects are properly corrected. Maintenance procedures for respirators should also include the proper cleaning and sanitizing of respiratory protection.

Training requirements should also be covered in the program. The benefits of a respiratory protection program will only be evident when persons required to wear respiratory protection are trained on the elements of the respiratory protection program. When persons required to wear respirators are not trained properly they may be unaware of the potential hazards associated with improper use of respiratory protection. They may not know that improper use of a respirator can result in excessive exposures to hazardous materials or can even be life threatening.

Finally, procedures that establish when and how the program is to be reviewed should also be included. Reassessment of the respiratory protection program will ensure that the changing respiratory protection needs of a mining operation are reflected in its program. Reviewing the program on a periodic basis will ensure that the respiratory protection program is understood and being followed by persons required to wear respiratory protection. Also comparing the components of the respiratory protection program with regulatory requirements will ensure continued compliance.

There is no correct format that needs to be followed when writing a respiratory protection program. A respiratory protection program should be easy to implement and follow, address the needs of the person required to implement the program and the person required to wear respiratory protection, and provide compliance



with regulatory requirements. There are volumes of information available on this subject. The major sources for information on how to write and implement an effective respiratory protection program include: The American National Standards Institute; National Institute for Occupational Safety and Health (NIOSH); Occupational Safety and Health Administration (OSHA); and Mine Safety and Health Administration (MSHA). Suppliers and manufacturers of respiratory protection can also be good sources for obtaining information on the subject of respiratory protection programs.

Respirators are designed to protect the wearer from hazardous materials. If the respirator is not used properly, due to any reason, the resulting exposure

may be the cause of irreparable harm. Providing respiratory protection without an established respiratory protection program can be a risky proposition. Respiratory protection, just like any production process, works best when procedures are well established and put into writing. A respirator used in conjunction with a well thought out respiratory protection program can be an effective temporary means to control personal exposures to numerous hazardous materials. Without established written procedures, proper use of respiratory protection is left to chance. The possible consequences of leaving the use of respiratory protection to chance may be a long term injury or even a fatality.

Know your limits

Don't drink and drive—it's a phrase all drivers have heard time and time again. Despite progress, Although, 45 people a day lose their lives in alcohol-related crashes.

It's important to realize that impairment begins with the first drink, and that alcohol is one of the few substances that does not have to be digested to begin affecting motor skills and ability. It is rapidly absorbed and promptly carried to all parts of the body, and, if alcohol is consumed on an empty stomach, it may reach the brain within two minutes. When consumed rapidly, the effect on the brain centers may last as long as five hours after it's been ingested.

A study at the University of Virginia Health Science Center, Department of Behavioral Medicine and Psychiatry, showed that the peak blood alcohol concentration (BAC) was not reached until 50 minutes after the last drink. That means it's impossible to judge what your level of functioning might be approximately one hour after drinking.

In addition, your blood alcohol level may be affected by your age, gender, physical condition, amount of food consumed and any drugs or medication taken. And it's important to remember different drinks may contain different amounts of alcohol.

To keep roadways safe for everybody, motorists must take personal responsibility when it comes to drinking and driving.

Remember that drinking and driving just don't mix—and the most important driver to look out for is yourself.

Reprinted from the Winter/Spring edition of Erie Insurance Group's newsletter in•sync

Alcohol impairment chart—male								
Approximate blood alcohol percentage								
Drinks	Body weight in pounds							
	100	120	140	160	180	200	220	240
	Only safe driving limit							
1	.04	.03	.03	.02	.02	.02	.02	.02
2	.08	.06	.05	.05	.04	.04	.03	.03
3	.11	.09	.08	.07	.06	.06	.05	.05
4	.15	.12	.11	.09	.08	.08	.07	.06
5	.19	.16	.13	.12	.11	.09	.09	.08
6	.23	.19	.16	.14	.13	.11	.10	.09
7	.26	.22	.19	.16	.15	.13	.12	.11
8	.30	.25	.21	.19	.17	.15	.14	.13
9	.34	.28	.24	.21	.19	.17	.15	.14
10	.38	.31	.27	.23	.21	.19	.17	.16

Subtract 0.01% for each 40 minutes of drinking.
One drink is 1-1/4 oz. of 80 proof liquor, 12 oz. of beer, or 5 oz. of table wine.

Penna. Liquor Control Board

Alcohol impairment chart—female								
Approximate blood alcohol percentage								
Drinks	Body weight in pounds							
	90	100	120	140	160	180	200	220
	Only safe driving limit							
1	.05	.05	.04	.03	.03	.03	.02	.02
2	.10	.09	.08	.07	.06	.05	.05	.04
3	.15	.14	.11	.10	.09	.08	.07	.06
4	.20	.18	.15	.13	.11	.10	.09	.08
5	.25	.23	.19	.16	.14	.13	.11	.10
6	.30	.27	.23	.19	.17	.15	.14	.12
7	.35	.32	.27	.23	.18	.18	.16	.14
8	.40	.36	.30	.26	.20	.20	.18	.17
9	.45	.41	.34	.29	.23	.23	.20	.19
10	.51	.45	.38	.32	.25	.25	.23	.21

Subtract 0.01% for each 40 minutes of drinking.
One drink is 1-1/4 oz. of 80 proof liquor, 12 oz. of beer, or 5 oz. of table wine.

Penna. Liquor Control Board

Every state outlaws driving with a blood alcohol concentration of over 0.10 percent, but your safety on the road is at risk well in advance of that. Use this chart as a guide—not a guarantee about blood alcohol concentrations. Remember that many factors influence how alcohol affects our bodies, including things like drug interactions, age and physical conditions. There are even differences in

how men's and women's bodies tend to respond to alcohol. Smaller size, less body fluid, and a higher percentage of body fat tend to make women feel the effect of a drink sooner and retain those effects longer.

NEVER drink and drive!

Poison ivy: Stay out of the woods

21

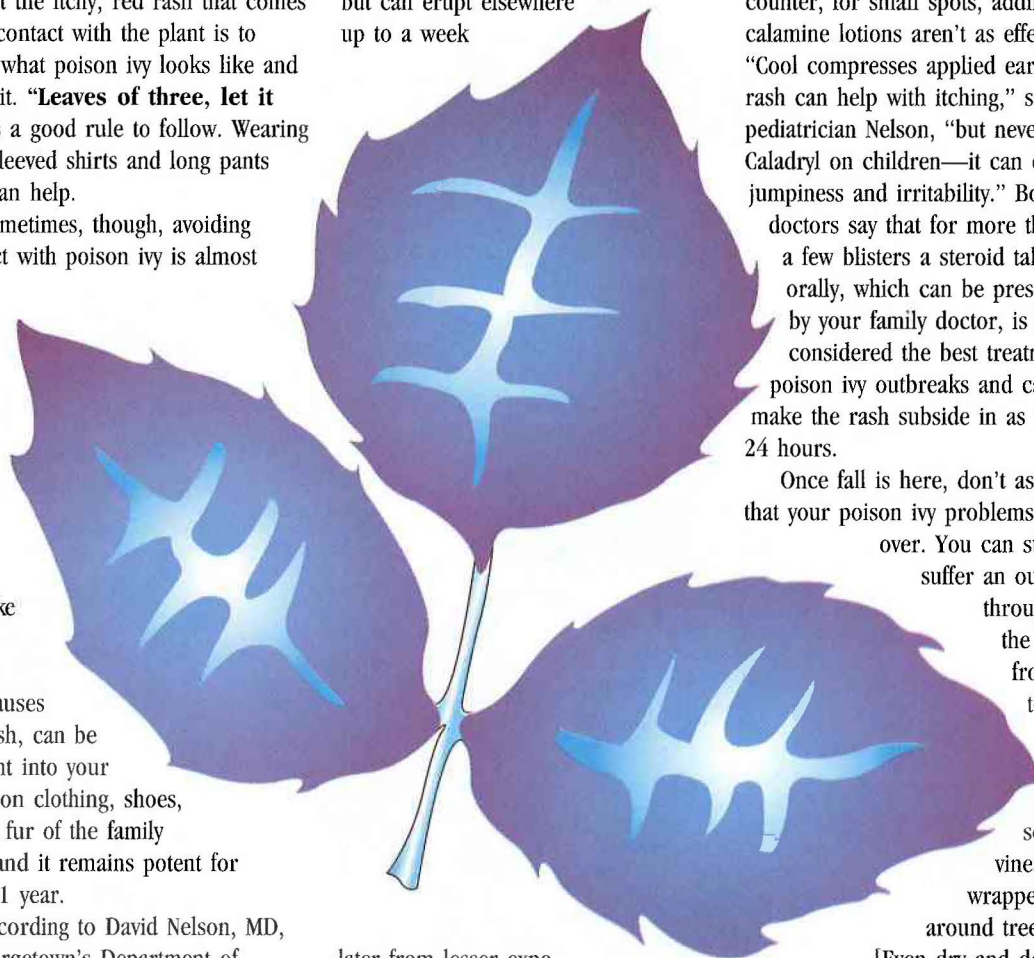
Even with summer almost gone, poison ivy is as close as your garden or nearby woods. The best defense against the itchy, red rash that comes from contact with the plant is to know what poison ivy looks like and avoid it. **"Leaves of three, let it be"** is a good rule to follow. Wearing long-sleeved shirts and long pants also can help.

Sometimes, though, avoiding contact with poison ivy is almost impossible. The chemical from the plant, a resin-like substance that causes the rash, can be brought into your home on clothing, shoes, or the fur of the family pet—and it remains potent for up to 1 year.

According to David Nelson, MD, of Georgetown's Department of Pediatrics, poison ivy dermatitis is far more common in older children than in adults and babies, not because they are more susceptible but because they are less supervised and more likely to play in the woods. But even babies kept mostly indoors can break out from crawling on the carpet where the dog has just rolled or an older sibling has walked.

"Resin from the plant causes your skin to erupt into blisters or a rash," explains James Welsh, MD, family practitioner and medical director of Georgetown University's Medical Center at Ballston in Arlington,

Virginia. "The rash generally appears within a few hours wherever the exposure was concentrated, but can erupt elsewhere up to a week



later from lesser exposure."

While scratching can distribute plant resin that's residing under your fingernails, it's a common misconception that fluid from the blisters will spread the "poison," Welsh says. Neither the redness nor the blister fluid causes the rash to spread.

Washing thoroughly with water, including under your fingernails—you can use a wet washcloth—within 10 minutes of exposure will prevent or lessen an outbreak and keep the resin from being spread to other parts of your body. You should also wash clothes and shoes that have

come into contact with the plant.

Welsh recommends hydrocortisone creams, available over the counter, for small spots, adding that calamine lotions aren't as effective. "Cool compresses applied early in the rash can help with itching," says pediatrician Nelson, "but never use Caladryl on children—it can cause jumpiness and irritability." Both doctors say that for more than just a few blisters a steroid taken orally, which can be prescribed by your family doctor, is now considered the best treatment for poison ivy outbreaks and can make the rash subside in as little as 24 hours.

Once fall is here, don't assume that your poison ivy problems are over. You can still suffer an outbreak throughout the year from touching bare poison ivy vines wrapped around trees.

[Even dry and dead poison ivy is still potent up to a year or more. Burning poison ivy that has been gathered in clearing brush can cause a severe reaction to those who are susceptible. The air-borne resins carried by the burning brush will settle on bare skin causing an outbreak and can even be inhaled causing greater difficulty.]

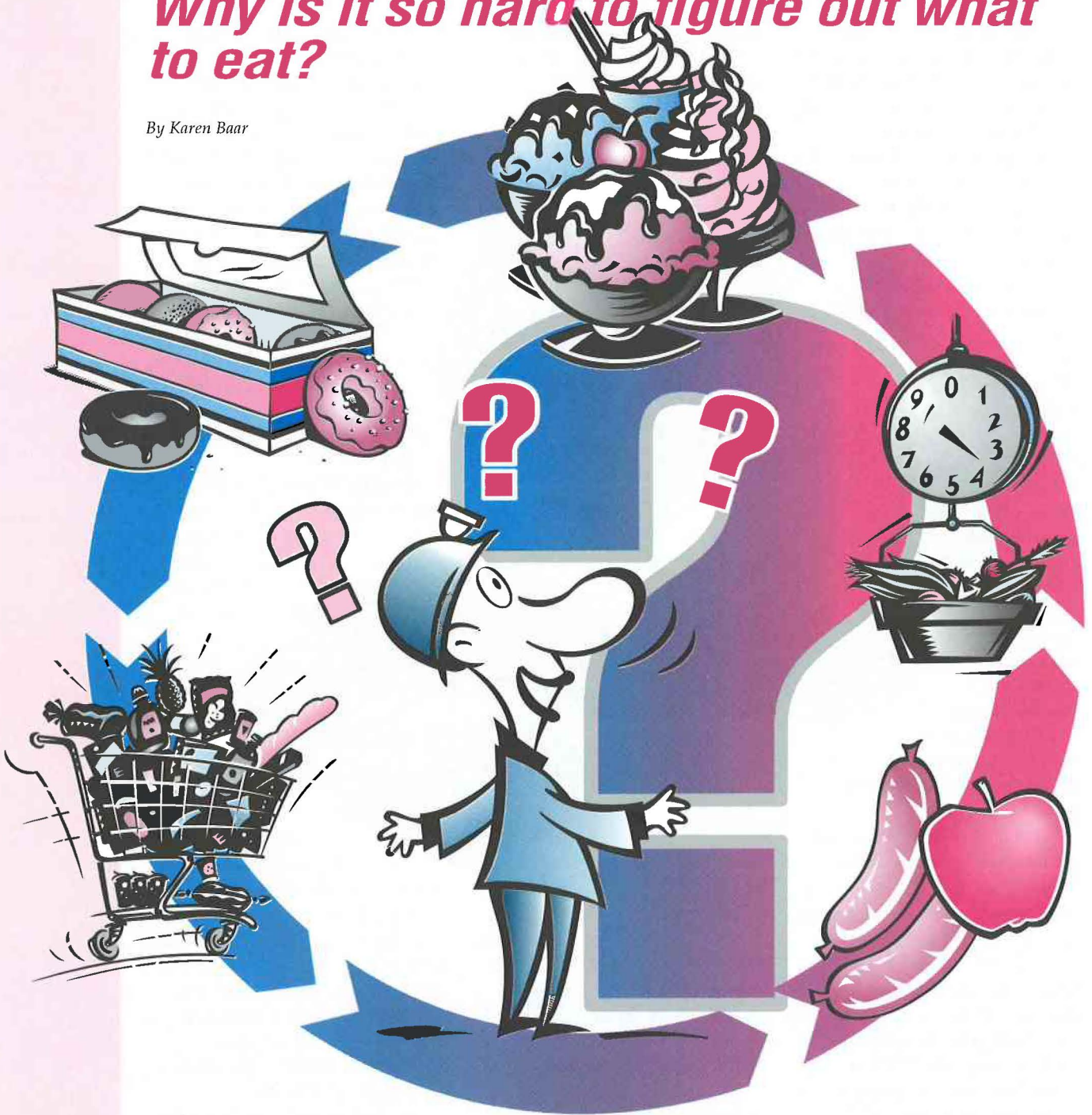
Incidentally, poison ivy is usually a glossy green in color—not purple as depicted here.]

Reprinted from the Summer 1996 issue of Washington, D.C.'s Georgetown University Medical Center's quarterly publication—Healthy Decisions.

FOOD CONFUSION

Why is it so hard to figure out what to eat?

By Karen Baar



Can hot dogs cause leukemia? Does tea protect against cancer? What's better for your heart: margarine or butter?

If you can answer any of these questions without hesitation, you're doing better than most people. Most of us are frustrated and confused about what to eat.

No wonder. Americans have been bombarded with contradictory messages about food. People who switched from butter to margarine to lower their saturated fat intake were

stunned by more recent reports that the “trans” fats in margarine may be even more dangerous than the saturated fat in butter. And while nutritionists advise us to eat lots of carbohydrates, especially from the grain group, some researchers say pasta and other carbs are fattening. It’s all getting to be a bit too much to swallow.

Two or three generations ago, people had a difficult time just affording *enough* food. But since about 1950, the cost of food as a percentage of income has gone down drastically. As a result, says nutritionist John Allred, co-author of *Taking the Fear out of Eating: A Nutritionists’ Guide to Sensible Food Choices*, we can now afford to choose foods for their specific nutritional benefits.

But much of the media focuses on only the most recent studies, without putting the news into a broader perspective. The scientists who actually run the studies understand that their results are just a small piece of a much larger puzzle. Somewhere between the scientific journal in which the news is first reported and the local newspaper, however, the message gets distorted.

Dr. Walter Willett, chairman of nutrition at Harvard School of Public Health, points out that many of the questions raised by journalists and consumers can’t be answered. “We’ve just started running large, long-term studies on the effects of different diets on health,” he says. “Ten years from now, we’ll have a better picture.” In the meantime, he warns, “What’s brand new is unlikely to be reliable. And what’s reliable isn’t likely to be newsworthy.” In other words, don’t believe everything you read.

Unfortunately, newsworthiness is often determined by what sells on the newsstands. And, says Patricia Thomas, editor of the *Harvard*

Health Letter, readers have an insatiable appetite for so-called “new hope” stories. People will always fix their eyes on a headline that offers the hope of a new solution.

But the media alone can’t be blamed for the confusion. Sometimes, to bring attention to themselves, research institutions exaggerate the findings of a particular study, or overeager researchers make public recommendations before final evidence is in. Then too, research results are often vigorously downplayed or hyped by food industry groups whose products are affected. And despite their scholarly image, even medical journals publish studies sure to be picked up by the popular press, in order to help increase their circulation, enhance their image and lure respected scientists to their pages. Just about everyone in the pipeline has a financial interest. Even the scientists know that publicity for their studies will help bring more funding for further study.

As a result, Americans have a lot of information— and misinformation— about nutrition. “The danger is that people will become cynical,” says Paul Raeburn, science editor at the Associated Press. “It’s easier to just say, ‘The hell with it,’ and eat whatever you want.” Coffee is the classic example, he adds. “First we got reports associating coffee with cancer and other health problems, then we got reports showing no association. All anyone wants to know is, ‘Can I have a cup of coffee in the morning or not?’”

And along with the confusion comes a heaping spoonful of guilt from eating all those supposedly bad foods or not eating enough good ones. “The way some people worry about the food they eat is frightening,” says Carolyn O’Neil, a registered dietitian and host of CNN’s food and

nutrition program, *On The Menu*. Describing lunch in the employee cafeteria, she says, “People are always coming up to tell me what they’re eating, as if they’re looking for approval. And they’re always checking out my plate to see what I’m eating!”

In nutrition there are no absolutes.

No one ever said hot dogs are good for you. Like a lot of junk food, they’re full of fat and salt and they contain antibacterial preservatives known as nitrates, which have long been linked to cancer in laboratory animals. It’s probably not a good idea for anyone to eat too many franks. But there’s no conclusive evidence linking hot dogs to leukemia or any other disease.

Research suggesting that tea may contain cancer-preventing compounds was performed on laboratory mice. Although the results are encouraging, they have yet to be demonstrated in human studies.

Solid fats of any kind, including butter and margarine, are more saturated and therefore likelier to clog arteries than oils. Most experts say to keep your use of butter, margarine and shortening to a minimum, and use olive oil, canola oil, corn oil, or other vegetable oils whenever possible.

Finally, when it comes to coffee, experts now say that two to three cups a day won’t hurt us.

As Thomas sums up, “Don’t check your common sense at the door when reading about health and nutrition. If an answer seems too easy, it’s probably not the right answer.”

Karen Baar is a freelance health writer in Woodbridge, Conn.

Reprinted from the January/February 1996 issue of American Health magazine.

THE LAST WORD...

It is better to rise from life as from a banquet—neither thirsty nor drunken.

— Aristotle

The world rewards the appearance of merit oftener than merit itself.

— François de La Rochefoucauld

If you wish your merit to be known, acknowledge that of other people.

— Oriental Proverb

Few minds wear out; more rust out.— Christian Nestell Bovee

Moderation is a fatal thing: nothing succeeds like excess.— Oscar Wilde

Money is like a sixth sense, and you can't make use of the other five without it.

— W. Somerset Maugham

Our necessities are few but our wants are endless.— Josh Billings

He that is of the opinion money will do everything may well be suspected of doing everything for money.— Benjamin Franklin

Ideas are a dime a dozen. People who put them into action are priceless.

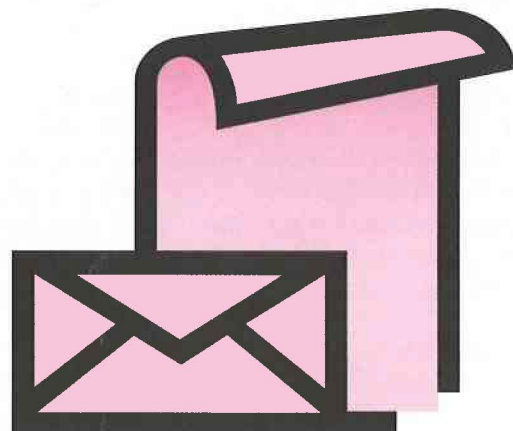
NOTICE: We welcome any materials that you submit to the Holmes Safety Association Bulletin. **We DESPERATELY need color photographs suitable for use on the front cover of the *Bulletin*.** We cannot guarantee that they will be published, but if they are, we will list the contributor(s). Please let us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

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

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

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

Call us with your comments—
we'd like to hear from you!



Holmes Safety Association Officers and Executive Committee 1995-1996

<i>Officer</i>	<i>Name</i>	<i>Representing</i>	<i>State</i>
President	John Shutack	Federal	VA
First Vice President	Steve Walker	Supplier	WV
Second Vice President	Fred Bowman	State	IL
Third Vice President	Gary Moore	Management	NM
Fourth Vice President	Roger Carlson	Labor	MN
Secretary-Treasurer	Robert Glatter	Federal	VA

<i>Name</i>	<i>Representing</i>	<i>State</i>	<i>Name</i>	<i>Representing</i>	<i>State</i>	<i>Name</i>	<i>Representing</i>	<i>State</i>
Barry Ryan	Federal	WV	H.L. Boling	Mgmt.	AZ	Robert Scaramozzino	UMWA	DC
Timothy Thompson	Federal	WV	Chuck Gessner	Mgmt.	AZ	Jeff Duncan	UMWA	PA
Bruce Dial	Federal	WV	Kevin Myers	Mgmt.	KY	Lex Prodan	UMWA	PA
Jerry Johnson	Federal	WV	Kyle Dotson	Mgmt.	AZ	Larry Frisbie	State	WA
Jim Myer	Federal	OH	Cheryl Suzio	Mgmt.	CT	Sam Vancil	State	IL
Robert Crumrine	Federal	OH	John DeMichiei	Mgmt.	PA	Ben Hart	State	FL
John Collins	Federal	OH	Richard Radakovich	Mgmt.	PA	Lee Graham	State	KS
Michael Lawless	Federal	WV	Ronald Corl	Mgmt.	PA	John Franklin	State	KY
Claude Narramore	Federal	VA	Jim Sells	Mgmt.	PA	Al Simonson	State	MN
Vern Gomez	Federal	VA	Myron Nehrebecki	Mgmt.	PA	Tom Gregorich	State	MN
Marvin Nichols	Federal	VA	Steven Reyba	Mgmt.	PA	Desi Apodaca	State	NM
Jesse Cole	Federal	WV	Andrew Hewitson	Mgmt.	PA	Doug Conaway	State	WV
Rexford Music	Federal	KY	Clifford Forrest	Mgmt.	PA	Tony Grbac	State	WV
Leland Payne	Federal	KY	Jon Merrifield	Mgmt.	OH	Douglas Martin	State	AZ
Joseph Pavlovich	Federal	KY	James Tompkins	Mgmt.	OH	Thomas Ward, Jr.	State	PA
Ron Deaton	Federal	KY	Mark Wharton	Mgmt.	CO	Joseph Sbaffoni	State	PA
Jon Montgomery	Federal	NY	Joseph Vendetti	Mgmt.	WY	William Garay	State	PA
Joseph Garcia	Federal	PA	William Craig	Mgmt.	WY	Paul Hummel	State	PA
Don Conrad	Federal	PA	Richard Burns	Mgmt.	WY	Ron Cunningham	State	OK
Donna Schorr	Federal	PA	Penny Traver	Mgmt.	MI	Phillip Johnson	State	KY
James Petrie	Federal	PA	Nancy Staley	Mgmt.	MI	Glen Rasco	State	GA
Bob Randolph	Federal	PA	William Vance	Mgmt.	NM	Jerry Duncan	Supplier	WV
Fred Hanson	Federal	CA	Gary Cook	Mgmt.	NM	Steve Lipe	Supplier	AZ
Doyle Fink	Federal	TX	Joseph Lamonica	Mgmt.	DC	Wayne Peterson	Insurance	MN
Martin Rosta	Federal	AL	Rick Wells	Mgmt.	KY	William Hoover	Emeritus	AZ
Dave Couillard	Federal	MN	Richie Phillips	Mgmt.	KY	Vern Demich	Emeritus	PA
James Salois	Federal	MN	Nelson Mueller	Mgmt.	TX	Harry Thompson	Emeritus	PA
Larry Ramey	Federal	CO	George Krug	Mgmt.	MA	Richard Machesky	Emeritus	PA
Judy Tate	Federal	OK	Lloyd Armstrong	Mgmt.	MN	Bill Powell	Emeritus	TX
Whitey Jacobson	Federal	TX	Greg Oster	Mgmt.	MN	Ford B. Ford	Emeritus	VA
Lonnie Gore	Mgmt.	WV	Frank Salas	Labor	AZ	Ronald Keaton	Emeritus	WV
Ernest Marcum	Mgmt.	WV	Henry Townsend	Contractor	TX	Irmadell Pugh	Emeritus	WV
Roger Ball	Mgmt.	WV	Larry Russell	Contractor	TX	Alex Bacho	Emeritus	MD
Adele Abrams	Mgmt.	DC	Joseph Main	UMWA	DC			

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

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

U.S. Department of Labor
MSHA, Holmes Safety Association
P.O. Box 4187
Falls Church, VA 22044-0187

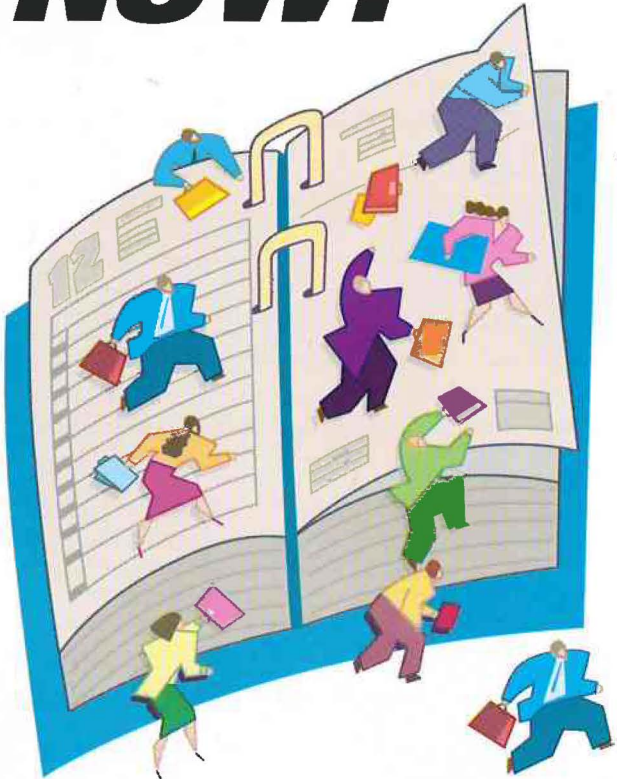
BULK RATE
POSTAGE & FEES PAID
DOL
PERMIT NO. G-59

*****3-DIGIT 258
INFORMATIONAL SERVICES BRANCH
NATIONAL MINE S & H ACADEMY
PO Box 1166
Beckley WV 25802-1166

JOIN and GROW with us

Mark your calendar
NOW!

Upcoming events:



- *Sep. 24-26, PETE '96, Pacific Eqpt. & Technology Expo, Costa Mesa, CA*
- *Sep. 26-27, Illinois Mining Inst. Meeting/ Exhibit '96, Gateway Conv. Ctr., Collinsville, IL*
- *Oct. 15-17, 1996 TRAM Conference/National Mine Instructors Seminar, National Mine Academy, Beckley, WV*
- *Oct. 16-19, Fifth Asia/Pacific Mining Conference and Exhibition, Jakarta Convention Center, Jakarta, Indonesia*
- *Nov. 7-8, Ky. Mining Institute Meeting/ Exhibit, Rupp Arena, Lexington, KY*