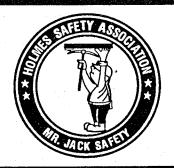
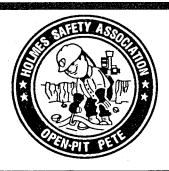
# BULLETIN





October 1990





# **Table of contents**

	I uze
Topic—"Welcome New Members"	2
Accident summary—"Fatal powred haulage accident"	6
Safety topic—"Ergonomics and CTDs"	8
Safety topic—"Outdoor work and skin cancer"	11
Safety topic—"Reminders for the winter season"	12
Safety topic—"Winter alert"	13
Safety reminder—"Ladder safety quiz"	14
Poster—"Ladder safety"	15
Poster—"R.E.A.P."	16
Safety reminder—"Warning about rising fatalities"	19
Topic—"Fly rock - a preventable accident?"	
Topic—"Job safety analysis"	
Accident summary—"Fatal roof fall accident"	22
Safety topic—"First aid - treat burns with care"	24
Topic—"Substance abuse treatment saves lives"	
Announcement—"JSA - a practical approach"	27
Topic—"The last word"	30

# KEEP US IN CIRCULATION

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

To report monthly chapter meetings, please use the postage-paid report form located in the centerfold of this Bulletin and return to the Holmes Safety Association.

# **Welcome New Members**

NAME	CHAPTER NO.	LOCATION
P & R Coal Company Inc.	8961	Venia, VA
Triad Mining, Inc. (Central Illinois Open Pit)	8962	Canton, IL
Planet Mining, Inc. (Shawmut Mine No. 23)	8963	Brockway, PA
Kittanning Auger Inc. (Waterman Mine)	8964	Homer City, PA
Falls Creek Energy Co. Inc. (Wilson III, Wishaw)	8965	Falls Creek, PA
Jenning Adkins Excavating	8966	Madison, WV
T & M Trucking	8967	Madison, WV
J & B Trucking	8968	Madison, WV
Pridemore Trucking	8969	Madison, WV
L. J. Mascaro, Inc.	8970	Herriman, UT
Maybrook Materials, Inc.	8971	Maybrook, NY
Callahan & Nannini Shale Inc.	8972	Salsbury, NY
Gabriel Construction	8973	North Wood, ND
Pioneer Concrete of Texas Inc. (Austin Sand & Gravel)	8974	Austin, TX
Coeburn Land Development, Inc.	8975	Coeburn, VA
Ivy Branch Coal Company, Inc.	8976	Climbfield, VA
Delta Coal Company, Inc.	8977	Rowe, VA

NAME	CHAPTER NO.	LOCATION
Koch Carbon Inc. (T.L. Strip #1)	8978	Rowe, Va
Tabcol Mining Inc.	8979	Freeburn, KY
Delta Coal Company, Inc. (No. 2)	8980	Elkhorn City, KY
KYV Coal Company, Inc.	8981	Elkhorn City, KY
Cherokee Mining Company, Inc. (No. 1)	8982	Phyllis, KY
Sunnyside Kentucky, Inc.	8983	Elkhorn City, KY
Rebb Energy Inc. (Prep Plant No. 1)	8984	Dry Branch, WV
Consolidation Coal Company (Blacksville #2 Prep Plant)	8985	Wana, WV
Rebb Energy Inc. (Rex Mine)	8986	Dry Branch, WV
Consolidation Coal Company (Blacksville #2)	8987	Wana, WV
Philippi Development Inc. (Sentinel Mine)	8988	Philippi, WV
Hill's Welding Company	8989	Elysburg, PA
Domestic Coal Energies	8990	Isom, KY
All Rock Products	8991	Salt Lake City, UT
Arundel Corporation (Greenspring Quarry)	8992	Baltimore, MD
J & J Company	8993	Phelps, KY
B & M Coal Company (No. 1 Mine)	8994	Pikeville, KY
Delaware County District 1	8995	Grove, OK

NAME		CHAPTER NO.	LOCATION
Mason Dixon Coal Company		8996	West Cameron, PA
Marlow Coal Company		8997	Grundy, VA
Genstar Stone Products Compa (White Marsh Sand & Gravel)		8998	White Marsh, MD
Genstar Stone Products Compa (Chase Sand Plant)	ny	8999	Chase, MD
Genstar Stone Products Compa (Churchville Quarry)	ny	9000	Churchville, MD
Genstar Stone Products Compa (Davidsonville Sand & Grave)		9001	Davidsonville, MD
Genstar Stone Products Compa	ny	9002	Marriottsville, MD
(Marriottsville Quarry) Genstar Stone Products Compa (Medford Quarry)	ny	9003	Medford, MD
Genstar Stone Products Compa (Middletown Quarry)	ny	9004	Middletown, Va
Genstar Stone Products Compa (Texas Quarry)	ny	9005	Texas, MD
Genstar Stone Products Compa (Frederick Quarry)	ny	9006	Frederick, MD
Bennett Mineral Company		9007	Walkerton, VA
The Kentucky Stone Company (Marion Mine and Mill)		9008	Marion, KY
The Kentucky Stone Company (Princeton Quarry and Mine)		9009	Princeton, KY
Arizona Petroleum Contractor		9010	Tucson, AZ
Bob Fritz Electrical		9011	Ringtown, PA
Yentar & Son's Blasting		9012	Golden, CO

NAME	CHAPTER NO.	LOCATION
Mountain Cement Company (Red Buttes Quarry)	9014	Laramie, WY
Mountain Cement Company (Hutton Lake Shale Quarry)	9015	Laramie, WY
Mountain Cement Company (Mountain Cement Mill)	9016	Laramie, WY
Coon Branch Coal Company	9017	Mora, VA
West Kentucky Mix Plant	9018	Madisonville, KY
Steele No. 1	9019	Owensboro, KY
Clay County Quarry	9020	Excelsior, MO
Wolfe Excavating Inc.	9021	Salt Lake City, UT
Beyer Crushed Rock Company	9022	Grandview, MO
Le Suer Richmond Slate Corp.	9023	Arvonia, VA
Addington Inc. (Highwall Miner)	9024	Boomer, WV

## **Announcement**

The 1990 West Virginia State Mine Rescue and First Aid Contest held at the National Mine Safety Academy, September 13 and 14, was again a very successful event. The following teams and individuals were presented trophies:

First-Aid

1st place:

1st place:
U.S. Steel Mining, Co., Inc.
Pinnacle – Gray Team
Pineville, WV
2nd place:
Jim Walter Resources, Inc.
Number 5 Team
Brookwood, AL
3rd Place:
Peabody Coal Company

Walhonde Team Montcoal, WV

Mine Rescue

Peabody Coal Co. Walhonde Team Montcoal, WV

	Roger Carpenter
	Peabody/EACC,
	Federal Number 2 Team
	Fairview, WV
2nc	d place:
	Larry Evans
	Peabody/EACC
	Pond Fork Team
	Wharton, WV
3rc	l place:
	Paul Prince
	Consolidation Coal Co.
	Buchanan Number 1 Team
	Mavisdale, WV

Benchman's

1st place:

**Please note:** We have received a number of comments concerning our July article titled "Improved Haul Road Berm Design." As with all articles printed in the Bulletin, the views and conclusions expressed in the article are those of the author and should not be interpreted as representing official policy of the Mine Safety and Health Administration.

# Holmes Safety Association Monthly Safety Topic



# Fatal powered haulage accident

GENERAL INFORMATION: A 27 yearold crusher operator with nearly two years mining experience was fatally injured attempting to realign the primary belt conveyor.

DESCRIPTION OF ACCIDENT: The victim reported to work at his regular starting time of 6:30 a.m. He performed his regular duties as primary crusher operator until approximately 10:15 a.m. At this time, he noticed the primary belt conveyor was running off track. He instructed his helper to continue feeding the crusher and left the primary crusher booth carrying a hammer and wrench.

The helper continued to feed the crusher until approximately 10:25 a.m. when he noticed a dark streak on top of the belt. He thought there were some chunks of large material lodged between the skirting and the top of the belt at the discharge point of the primary crusher. He shut off the feed to the crusher, and continued to run the belt until it was empty. He then shut down the crusher and the belt conveyor and telephoned the secondary crusher operator. He told him of his intentions and instructed him to lock out the main disconnect switch and set the manually applied backstop brake. He proceeded to the discharge point and discovered there were no chunks caught between the skirting and the belt. He then checked the tail pulley and removed several chunks. As he was leaving the area, he was hailed by the foreman who stated

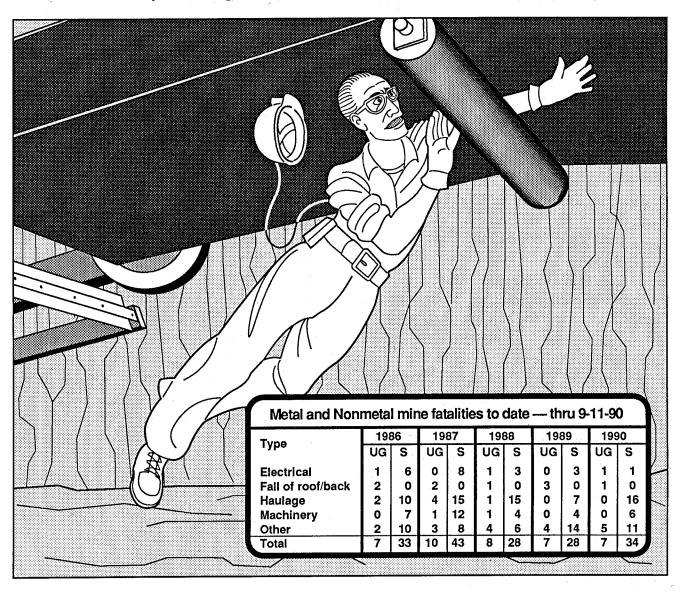
he had just noticed the victim's legs protruding from the frame work at the bottom of the belt conveyor. They proceeded to the scene and found the victim was entangled between the adjustment idler and the belt. Help was summoned and the local fire company ambulance responded. A come-along was used to free the victim from the belt and idler. He was pronounced dead at the scene by the county coroner and was subsequently transported to the Medical Examiner's Office.

The equipment involved in the accident was a Link Belt conveyor, 48 inches wide and 367 feet long which was powered by a 125 horsepower electric motor. The belt conveyor was provided with a 30-inch-diameter by 52-inch-wide smooth head pulley and a 30-inch-diameter by 54-inch-wide self-cleaning-type tail pulley. The adjustment or tracking idler was 6 inches in diameter by 52 inches wide. The belt conveyor was on a 15 degree incline equipped with a mechanical hand applied backstop brake. The design carrying capacity was 10 tons per minute, 600 tons per hour. The belt conveyor could be de-energized from two different locations: (1) the primary crusher control room and (2) at the top of the belt conveyor in the control room for the 66 secondary crusher. The disconnect switch and brake were located at the secondary crusher operator's platform. The crusher operators could communicate by telephone, citizen's band radio, or by using a

siren system. Reportedly, the conveyor belt would run off track when crushing wet material. When tracking the belt, the proper procedure was to de-energize the system and lock it out. The company had a written step-by-step lock-out procedure which was posted in the primary and secondary control rooms. All employees were provided with their own lock and keys. The tools involved were an open end box wrench and a sledgehammer. The adjusting or tracking idler was located under the belt conveyor just ahead of where the primary crusher dumped onto the belt conveyor. The opening under

the belt leading to the idler was 36 inches above ground level and the tracking idler was about 24 inches above ground level. The material being crushed was wet due to excessive rainfall.

of the accident was the failure of the victim to follow established policies and procedures. The company had established lock-out procedures in effect that were written and posted. The victim disregarded these procedures and attempted to work on a moving machine part.



# **Ergonomics and CTDs**

An ergonomics-oriented JSA program can be particularly helpful for those of you whose work requires you to lift, bend, stoop, twist, or use hand tools. Chances are you have become more familiar than you want to be with over-exertion. Hernias, sprained joints, and strained backs are typical injuries resulting from over-exertion. Since these types of injuries are so common, the benefits of redesigning jobs to reduce the possibility of over-exertion are obvious.

What may surprise you is that repeated over-exertion can lead to serious health problems. Cumulative Trauma Disorders (CTDs) are recognized occupational illnesses that develop over periods of weeks, months, or even years as a result of repeated stress on a particular body part. Each repetition of an activity produces some trauma or wear and tear on the tissues and joints of the body, ultimately leading to an abnormal, painful condition.

The parts of the body that are most susceptible to CTDs are the shoulder, the elbow, and the hand and wrist.

Shoulder damage may occur as the result of constant reaching and working with the arms above shoulder level; repeated reaching behind the body; or throwing parts into a bin behind the body. A typical CTD is shoulder tendonitis (inflamed tendons around the shoulder).

Elbow disorders often occur when arm tendons are stressed by the inward and outward rotation of the forearm when the wrist is bent. Weekend athletes know this condition, depending on their sport, as tennis or golfer's elbow.

Hand and wrist conditions are often the most serious of the CTDs, as well as the most common. Postures for the hand and wrist used by workers on the job strongly influence the workers' ability to reach, hold, and use equipment. Ultimately, these postures determine how long a worker can perform a job without developing a serious disorder.

Following are descriptions of the five most stressful hand and wrist postures:

- **1.** *Ulnar deviation:* Bending the wrist toward the little finger.
- **2.** *Radial deviation:* Bending the wrist toward the thumb.
- 3. *Extension:* Bending the wrist up and back.
- **4.** *Flexion:* Bending the wrist down toward the palm.
- **5.** *Pinching:* Opposing the inside surface of the thumb to the index finger.

Carpal Tunnel Syndrome (CTS) is the most well-known of the CTDs of the hand and wrist. The tendons for flexing the fingers, the median nerve, and blood vessels pass through the carpal tunnel from the forearm to the hand. CTS occurs when the tendons become swollen in the cramped carpal tunnel, causing the median nerve to be pinched. Victims experience pain, numbness, and tingling of the hands, usually at the first three fingers and the base of the thumb. The condition may affect both hands or only the dominant hand. Symptoms are often most acute while sleeping. Advanced cases may include a wasting away of muscles at the base of the thumb and an apparent weakness and clumsiness of the hand.

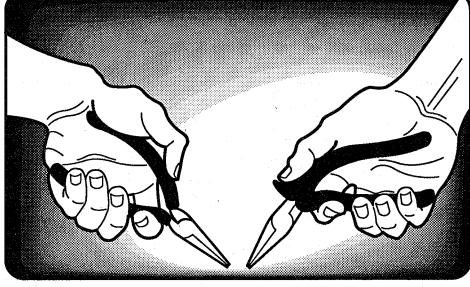
Of twenty-three CTDs reported to MSHA from mines in the North Central District from January 1987 through March 1990, fifteen involved disorders of the hand or wrist. Eleven were confirmed cases of CTS, seven of which required surgery to correct. The activities that led

to the disorders included: using hand tools; loading and unloading materials; pushing powder into drilled holes; operating a keyboard; and picking clay off a conveyor belt (see attached summary of North Central District CTDs).

Jobs that combine high force and high repetition of hand and wrist movements from the stressful postures mentioned above pose the greatest risk of CTS. Often these jobs involve the use of hand tools.

Typically, tool users have little, if any, input into the selection and purchase of tools; consequently, many tools do not fit the workers who use them.

When



The straight pliers on the left has a straight profile requiring an ulnar deviation of the hand when working at bench level, whereas the bent pliers on the right allows the worker to maintain the wrist in a neutral position.

identifying potential hand tool hazards, look for these indicators of poor tool selection and use: static loading of arm and shoulder muscles (e.g., working above head level, as in painting or scraping a ceiling); awkward hand position, especially wrist deviation; excessive or continuous pressure on the palm or fingers; exposure to vibration from power tools; pinch points with double-handled tools; and handles that require stretching of the hand to grip or high force to hold (see the attached illustrations of straight and bent pliers and hand tool postures).

Through the recognition and prevention of CTD hazards as part of the JSA process, you can contribute to making your workplace not only less dangerous, but also less stressful and more comfortable. People exposed to the following four types of work conditions are particularly susceptible to CTDs:

1. Crowding or Cramping. Is the worker forced to stoop or bend to fit the workplace? Are natural movements constrained or blocked?

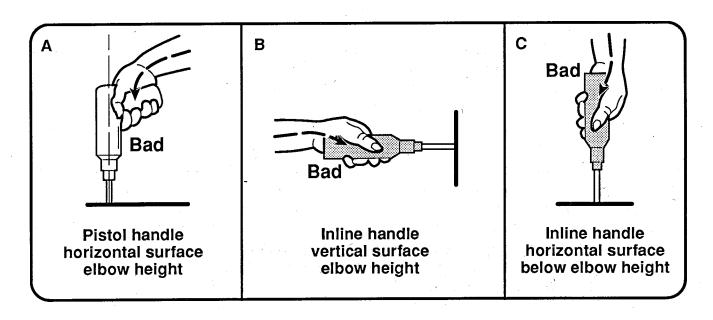
2. Twisting or Turning. Is the worker

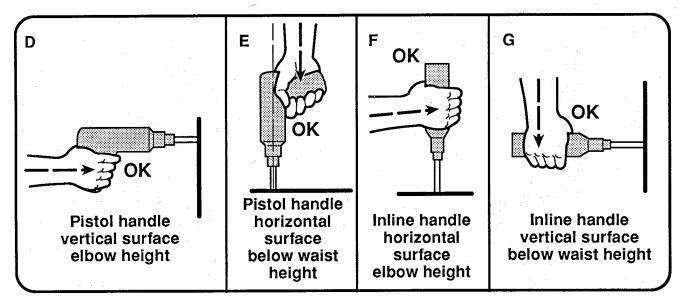
forced to twist the spine to see and reach tools or materials?

3. Repeated Reaching Motions. Is the worker forced to stretch and lean to reach and grasp needed objects or controls?

4. Misalignment of Body Parts. Is the worker forced to frequently have one shoulder higher than the other, or have the spine or neck bent to one side or the other?

Obviously, there is more to learn about Job Safety Analysis, ergonomics, and Cumulative Trauma Disorders than there is space to discuss them here. Watch for announcements from the Academy regarding new training materials on these topics. If you have questions about additional training materials or services available, be sure to give your local MSHA field office a call.





Example of wrist postures used with various hand tools and work station layout (Armstrong, T., An Ergonomic guide to carpal tunnel syndrome. AIHA, Akron, Ohio, 1983).

From the July 1990 issue of Cal Quarryman



# Reminders for the winter season

National Mine Health and Safety Academy

For the coal mining industry, the approach of cold, winter months brings a particularly hazardous season of the year. Almost every major explosion that has occurred in a bituminous coal mine has occurred in the late fall, winter, or early spring months. Though speculation is abundant, no one seems to have a definitive answer as to why these occurrences are more frequent during this particular period.

Of course, all who work in coal mines realize now that the September-April period comprises the "drying out" season for mining operations. In the spring and summer months the outside air is about the same or of a higher temperature than that of the workings. Outside air during these months usually contains large amounts of moisture. As the warm air passes through the workings, it is cooled and, in the process, loses its moisture. This moisture is deposited on the mine surfaces, and a situation commonly known as "sweating" occurs. In contrast, in the late fall, winter and early spring seasons, cold air enters the mine and is warmed. The changing of the air from cold to warm causes it to pick up or gather moisture in its travels. The absorbing of this moisture by the warmed air causes the mine surfaces to "dry out".

It is generally agreed that it is better to work in a dry area than a wet one. It is also agreed that dry areas create greater explosion hazards than wet areas unless precautions are taken. Areas that are particularly wet during the summer months and become dry during the winter months require especially close attention to rock dusting. Also, because of this drying out,

explosions can travel more rapidly and further through the mine. Dry dust can enter into the explosion more readily which increases the force which in turn kicks up more dust and permits it to spread more rapidly.

Investigators of the numerous explosions that have occurred in bituminous coal mines over the years have also found that the occurrences resulted, in part, from the accumulation of large quantities of methane gas. Further, they have found in some cases that the gas was ignited by electrical equipment not maintained in permissible condition and that the explosion was able to spread into other parts of the mine because coal dust entered into the explosion. This methane gas was allowed to accumulate due to ventilation interruption and the gas was not discovered, even in those areas where detection instruments were normally expected to have been used.

Winter is considered the mine-explosion season. It is fundamentally necessary that all precautions be taken to prevent conditions favorable for explosions. This means that at all times adequate volumes of air must be maintained at the working faces. Gas detection must be performed regularly and in every location required by the Federal Law and any other areas where methane could accumulate. It is equally important to insure that the air is not short circuited by hanging or tying up a check or line curtain, and that the integrity of permanent stoppings are maintained.

The responsibility for ensuring these measures are taken to prevent future methane or coal dust explosions belongs to everyone in the coal mine. Let's be faithful to these tasks during the coming months and eliminate any chance for an explosion in your mine.

# Recent winter explosions

1989, September 13	Williams Station
	Wheatcroft, KY
1982, January 20	R.F.H.
	Craynor, KY
1981, December 8	Grundy #21
	Whitwell, TN
1981, December 7	Adkins
	Topmost, KY
1981, April 15	Dutch Creek
	Redstone, CO
1980, November 7	Ferrell
	Madison, WV
1976, March 9 & 11	Scotia
The second secon	Oven Fork, KY
1972, December 16	Itmann
	Itmann, WV
1970, December 16	Finley
	Hyden, KY
1968, November 20	Farmington #9
	Farmington, WV

# "Winter Alert" calls attention to seasonal coal mining hazards

With the arrival of colder weather, MSHA once again is alerting the underground coal industry to pay special attention to increased hazards during this season. MSHA's records show that, from the mid-1950s to the present, about seven out of 10 of the mine disasters that killed five or more persons in the United States have occurred between the beginning of the fall and the spring seasons. Most of these major underground accidents involved explosions of methane or coal dust.

In winter months, falling temperatures and barometric pressure changes can

increase the risk of mine explosions. During this season, cool, dry air enters underground coal mines, becomes warm and draws moisture from the mine. As coal dust dries out, it may become suspended in mine air where it is susceptible to exploding under certain conditions if an ignition source is present.

Occurrence of low barometric pressures may add to the risks by allowing potentially explosive methane to migrate from inactive parts of the mine to active or working sections, thus increasing the possibility that there could be an explosion.

"Serious accidents can be prevented," said William J. Tattersall, assistant secretary of labor for mine safety and health, "but accident prevention requires that everybody—not just a few people—pay close daily attention to what they do."

He added, "It is just good sense to redouble our safety efforts to deal with added hazards during this 'Winter Alert' period. MSHA is reminding the industry to devote particular attention to controlling float coal dust and maintaining proper mine ventilation procedures. And we're encouraging mine operators to make frequent tests for methane, re-emphasize safe use of explosives, and use adequate rockdusting methods."

Rockdusting is the process of applying powdered limestone or other inert material to underground areas to reduce the explosive potential of settled dust by reducing its combustibility thus preventing it from becoming involved in a methane and/or coal dust explosion.

The presence of cooler air during this season also can cause warm rock to contract and crack, increasing the possibility of a mine roof fall, also a leading cause of fatalities in underground coal mines, and MSHA is urging operators and miners to pay special attention to such hazardous conditions.

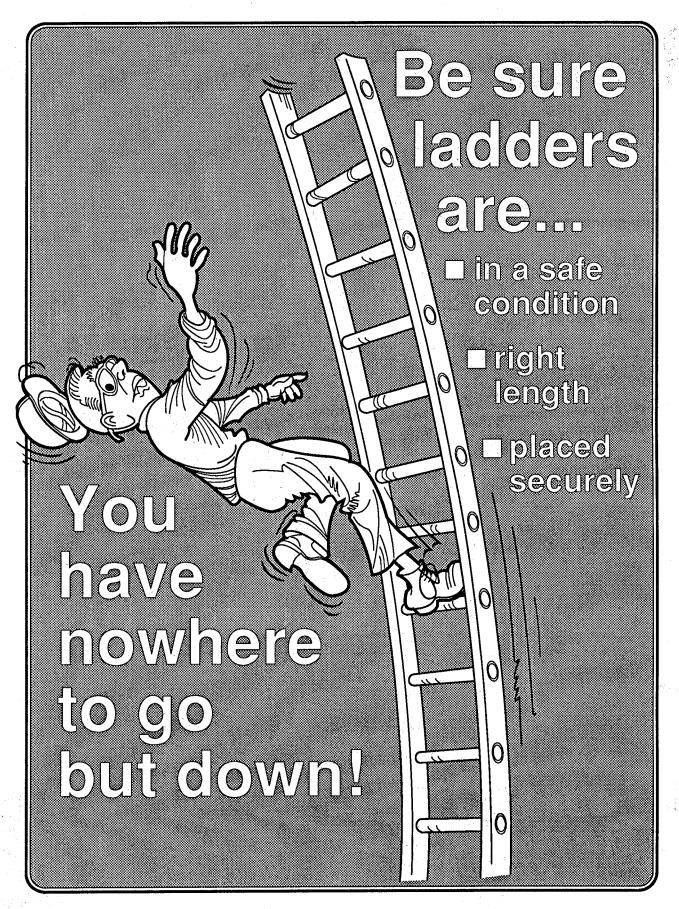
# Safety reminder Ladder safety quiz

To test your knowledge of ladder safety try this quiz. Answer true or false to the statements below. Then grade yourself. If you get less than 7 correct you might want to consider using nothing larger than the kitchen step stool (just kidding!).

- 1. Straight and extension ladders must be high enough to reach the work without requiring you to stand on the top two rungs.
- 2. Straight and extension ladders must be high enough to extend at lease three feet above the work area.
- 3. Metal ladders can be substituted for wood ladders in any situation.
- 4. Ladders should be painted bright yellow or orange to make them easier to see in poor light.
- 5. Safety feet are required on all straight and extension ladders and are designed to compensate for uneven or soft ground.
- 6. The one-fourth rule states that for every four feet of ladder support the bottom should be one foot away from the base of the work area.
- 7. The safety feet on straight and extension ladders replace the need for tying off or supporting the ladder by a person on the ground.
- 8. When climbing down ladders that are longer than 20 feet, it is best to face away from the ladder so you can keep the ground in view at all times.
- 9. Your belt buckle should always be kept between the rails to prevent you from over-reaching.

Answers to quiz

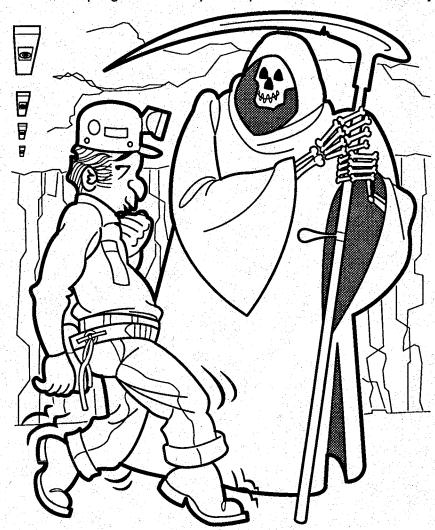
- 1. False. A straight or extension ladder must be high enough to reach the work without requiring you to stand on the top three rungs. On a step ladder you should not stand on the top two steps.
- 2. True.
- 3. False. Metal ladders should never be used where there is any possibility that they might come into contact with electrical lines. This is one of the most common causes of electrocution deaths.
- 4. False. Wooden ladders in particular should never be painted with anything other than a clear sealant. Paint can cover up structural defects.
- 5. False. Safety feet are required on all non-wooden straight and extension ladders, but they are designed to provide traction, not to compensate for soft or uneven ground. In such situations a large board or other solid, flat object should be placed beneath the safety feet.
- 6. True.
- 7. False. Straight and extension ladders should be tied off as close to the support point as possible. If this is not possible, someone should support the ladder from below.
- 8. False. You should always climb and descend a ladder while facing it, keeping both hands on the ladder. Use a tool belt or a bucket attached to a hand line to raise and lower tools and equipment.
- 9. True. If the area you must reach means extending your body beyond this point, climb down and move the ladder.



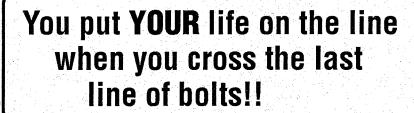
Courtesy of: Mines Accident Prevention Association Ontario, Canada
October 1990

# Roof Evaluation—Accident Prevention

REAP—a program developed to promote health and safety awareness in mining



This halloween you'll find more than spooks and goblins when you go inby supported roof!



MINERS: Credit for this month's safety slogan goes to: a concerned MSHA employee. Please send your suggestions to: MSHA, Educational Policy & Development, 4015 Wilson Blvd., Graphics Room 533A, Arlington, VA 22203-1984. Phone: (703) 235-1400



October 1990

5000-22 (Rev. 12-78)



# Holmes Safety Association Meeting Report Form

(Please take the time to fill in the questionnaire at the bottom)

is month
is month
(See address label, if incorrect, please indicate change) er number to give you credit for your HSA meetings
and <i>TAPE!</i> 3. Free mail in y jam the automatic sorters. Sharply creased folds will mail without tape
5. What articles or features do you especially like?
Please rank them 1-5 in order of appreciation with 1 being the highest.  A. Safety topics B. Accident summaries
<ul> <li>C. Posters</li></ul>

Postage and Fees PAID U.S. Department of Labor LAB 441

### MSHA, Office of Holmes Safety Association Educational Policy & Development 4015 Wilson Boulevard

Arlington, Virginia 22203-1984

# Federal mine safety chief warns mine operators about rising fatalities

Alarmed that both the number of coal and non-coal mining fatalities and the rate of fatalities per total hours worked increased in the first half of 1990 compared to the same period last year, Assistant Secretary of Labor for Mine Safety and Health William J. Tattersall announced that the Mine Safety and Health Administration (MSHA) will step up its enforcement programs considerably.

"I'm alarmed about the increase in the industry's fatality record thus far this year," Tattersall said. "The increase in coal and non-coal mining deaths in the first half of this year already has spurred MSHA to add more muscle to the strong enforcement measures the agency adopted this summer to help turn this trend around.

"These measures include a program that targets for special attention the states of Kentucky, West Virginia, Virginia and Pennsylvania. These states historically have accounted for about 70 percent of coal mining deaths. Another program identifies mines with an excessive history of violations. In an additional initiative, the agency is identifying mines with high fire or explosion potential. The mines involved in these new programs may face stepped-up inspections and enforcement actions such as closure orders and increased penalty assessments.

"Safety is the responsibility of mine operators and industry officials must double their efforts to make safety a prime concern at every mine site. From 1980 to 1989, the industry was able to reduce mining deaths by 50 percent. It would be tragic to see the number of yearly fatalities jump back up.

Thirty-three coal miners died on the job through June of this year compared to 25 during the same period of 1989. The rate of fatal injuries in coal mining was .04 per 200,000 employee work-hours during the first half of 1990 compared to .03 for the first six months of 1989 and .05 for all of last year.

The rate for nonfatal coal mining injuries involving lost worktime during the first half of 1990 was 7.61 injuries per 200,000 employee-hours, up from 7.57 in the same period of 1989. The rate for all types of injuries in coal mining was 9.78 per 200,000 work-hours down from 10.09 for the same period of 1989.

Coal miners worked 155.1 million hours during the first six months of 1990 compared to 146.1 million for the same period of 1989. Average employment during the first six months was 157,410 compared to 158,803 for the same period last year. Coal mines produced 510.1 million tons of coal through June 1990, up from 465.9 million during the same period last year.

Twenty-eight metal and nonmetal (non-coal) miners died in accidents in the first six months of this year compared to 25 for the same period in 1989. The rate of fatal injuries in metal and nonmetal mining through June 1990 was .03 per 200,000 employeehours compared to .02 for the same period of 1989.

The rate of nonfatal lost-time injuries at metal and nonmetal mines was 4.18 for the first half of 1990 down from 4.40 for the same period of 1989. The rate for all types of metal and nonmetal mining injuries for the first half of this year was 6.93

down from 7.76 for the same period of 1989.

Metal and nonmetal miners worked 207.8 million hours through June of this year compared to 204.6 million for the same period of 1989. Average employment for the period was 223,310 compared to 222,451 for the first half of 1989.

Additional information on mining injuries will be published in "Mine Injuries and Worktime, Quarterly, January-June, 1990", available in coming months from the Office of Information and Public Affairs, MSHA, 4015 Wilson Blvd., Arlington, Va. 22203. Telephone: (703) 235-1452.

# Fly rock — a preventable accident?

If a drill operator's attention is diverted and he doesn't notice and report a void or soft spot encountered by the drill, or a drill steel deflection, everyone would expect the activities that come after the drilling to proceed routinely. This error by omission could be a major contributor to accidents from fly rock.

This does not mean that all of the irregularities in the formation can be detected by every operator on every model of drill in use in the mining industry. But there is some evidence to suggest that an alert and experienced drill operator could be the first line of defense in preventing fly rock blasting accidents.

The Mine Safety and Health Administration (MSHA) has examined numerous recent blasting accidents and the single most commonly cited explanation of fly rock injuries has been attributed to undetected or unreported formation weaknesses in the drilling and blasting pattern area. These manifest themselves as mud seams, voids, jointing, and similar naturally occurring irregularities, but nearly always after the accident.

Every foreman, drill operator, and contractor should be thinking ahead about how they could finish the pattern and make a successful blast if a drilled hole becomes unusable because of one of the

above conditions. Examination of the surface and the drill cuttings may not reveal anything out of the ordinary. Even the exposed face may not reveal a problem. So what's left? The drill operator. The same drill operator who sensed an event as it happened may be the key to preventing some fly rock blasting accidents. you should encourage your drillers to log/report all unusual events by hole number and depth. Some of the more recent fatalities showed one victim was over 600 feet from the hole, another was over 900 feet away, and in several nonfatal cases the victims were between 1,000 and 1,500 feet away from the blast-This does not suggest that bad ground is the single cause of fly rock. Many times the cause is too much burden on the hole. Other times fly rock is caused by a misfire in a hole in front of another causing a drastic increase in the burden on the later holes at the rear.

This discussion only touches on some of the causes to the dangerous problem of fly rock during a blast. But when a drill operator may be able to identify irregularities before a hole is loaded, their observations should be investigated and may go a long way toward reducing the frequency of fly rock injuries.

# Job safety analysis

By: Douglas K. Martin, Arizona State mine inspector

Several safety manuals insist there is no such thing as an accident. There are only failures on the part of people to control the situation. Machinery, equipment, vehicles, tools, timbers, structures are only inanimate objects and by themselves cannot cause an "incident". An "incident" occurs when the people who operate or maintain the equipment fail to do so properly. If the unplanned release of energy or hazardous material (I define this as an "accident") causes injury or property damage, this "incident" can be traced back to come individual or group of individuals who have failed to recognize the potential for this "incident" to happen.

The text books are strong with the definition of incident, and they do bring home the point. Proper planning and anticipating as to under what circumstances and "incident" can occur, goes a long way toward avoiding that accident.

Job Safety Analysis is based on the concept that any job can be broken down into a series of relatively simple steps, that any hazards associated with each step can be identified and that solutions can be developed to control each hazard.

The U.S. Department of Labor's Mine Safety and Health Administration has conducted extensive research on the subject and condensed much of it into a pamphletavailable to anyone in any phase of mining. Copies of the pamphlet also are available from the Arizona State Mine Inspector's Office.

A detailed analysis of an accident will normally reveal three levels of causes for that accident; basic, indirect, and direct causes.

At the basic level, Job Safety Analysis will reveal that accidents may be remedied by establishing meaningful safety

policies, creating a safety awareness, and dealing with the personal and environmental factors that lead to accidents.

Indirect causes also may be identified and eliminated through Job safety Analysis. Unsafe acts and conditions can be discovered and safe procedures developed before an accident occurs. Safety training and education programs, improvement in the work environment, and safe design and maintenance of equipment and facilities may be all it takes to prevent an accident.

At the third level (direct causes), Job Safety Analysis addresses itself to the protection of people, should an unplanned release of energy or hazardous material occur. Where possible, the quantities of available energy or hazardous material must be reduced. If the quantities cannot be reduced, the site should be reinforced and each worker protected with appropriate equipment and guards. This is also the level at which emergency procedures would be developed.

Making practical application of Job Safety Analysis is fairly simple: (1) Select the job to be analyzed, (2) Break the job into its basic steps, (3) Identify the hazards associated with each step, and (4) Control each hazard.

The worker on the job should be kept actively involved throughout the entire process of Job Safety Analysis. The job breakdown, the hazards, and the solutions should all be discussed with the employee. The more the employee is involved, the more successful the Job Safety Analysis will be, and all can participate in "Safe Production."

Reprinted from the **Southwest Contractor**, September 1990

# Holmes Safety Association Monthly Safety Topic

# Fatal roof fall accident



GENERAL INFORMATION: A 21 yearold general laborer with less than two months total mining experience lost his life in a massive roof fall. The mine was developed using five drift openings from the surface into the coalbed which averages 36 to 42 inches in thickness.

The mining operations at the time of the accident consisted of developing 10 entries on 55- by 75-foot centers. The immediate roof consisted of 36 inches of laminated shale and 40 feet of firm shale. The roof span over the roadways was 20 feet in width and supported by 30-inch conventional roof bolts.

DESCRIPTION OF ACCIDENT: At 7 a.m. on the day of the accident, the day shift production crew under the supervision of the section foreman, entered the mine and relieved out the midnight production crew on the section. The section foreman examined the working section, and finding no hazardous conditions, began normal coal production.

The mine foreman assigned the victim to assist the shop electrician on the surface in changing batteries on the scoops and assisting in loading mine supplies.

About 12:30 p.m., the mine foreman and the victim entered the mine and traveled the No. 4 entry to within 2-1/2 crosscuts of the face where they met the section foreman. The mine foreman then pro-

ceeded across the section to examine a sump pump. The section foreman and the victim proceeded up to the last open crosscut in the No. 4 entry. They then traveled through the last open crosscut to No. 3 entry. The section foreman told the victim that the last open crosscuts in all entries had been mined through and check curtains in conjunction with line brattice would have to be installed. They then proceeded to the face of No. 5 entry. The section foreman examined the face area and retreated to the intersection outby the face where he instructed the victim to obtain the line brattice that was lying on the inby right corner of the intersection and bring it with him to the No. 4 entry. The section foreman was going to demonstrate to the victim the proper method of installing face ventilation. The section foreman had crawled approximately 18 feet through the crosscut toward No. 4 entry when the roof in the No. 5 entry and intersection fell without warning.

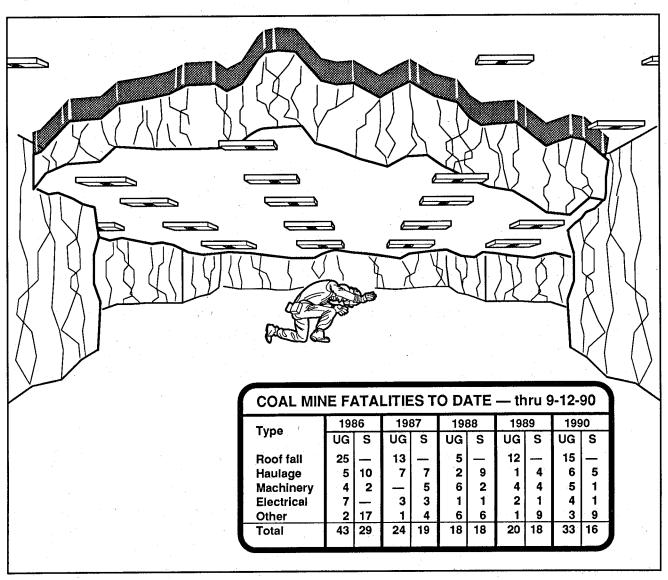
Immediately after the roof fall occurred, the section foreman, not knowing if the victim had escaped the fall, began to conduct a search of the section. After the victim could not be located, the section foreman decided he must be under the roof fall. Rescue and recovery operations were started immediately from crosscuts right and left. The victim was discovered and transported to the surface at 9 p.m. He was placed in an awaiting ambulance and transported to General Hospital

pital where he was pronounced dead on arrival.

CONCLUSION: The accident and resultant fatality occurred when a section of mine roof containing a slickensided formation fell without any warning. This slip could not have been detected by visual observations, sound-and-vibration test method or the drilling of test holes as required by the approved roof control plan. Subsequent investigation revealed that the roof span over the roadways in the Nos. 1 through 10 entries and connecting crosscuts left and right for a distance

of approximately 100 feet outby the faces was not supported adequately, in that the torque range on 113 of 160 conventional roof bolts tested did not maintain at least 70% of the minimum torque or tension (120 to 160 foot-pounds) specified in the approved roof control plan.

The approved roof control plan was not being complied with, in that test holes were not drilled in the mine roof in the last open crosscut between the Nos. 7 and 8 entry and in the last open crosscut between the Nos. 9 and 10 entry.





Treat burns with care

When you weld or use a blow torch, a spark may fly into your glove or boot in a split second. When you adjust a pipe, a powerful blast of sizzling steam may suddenly escape and injure exposed skin. Direct exposure of the skin of any form of heat, even to the sun, can result in a firstor second-degree burn. If you or one of your co-workers works around heat hazards, know how to treat burn injuries.

First, remember to follow your company's emergency medical procedures. Next, proceed with caution. When in doubt about proper treatment, seek medical advice. Improper treatment of burns will delay the healing process and increase the chance of infection. The wrong treatment may worsen the injury.

If you act on some myths about burns you may cause further damage to the skin. One of the biggest myths is to treat

burns with butter. If you slather a burn with butter, you'll make it much worse. The butter adds to the heat because it insulates the heat in the wound. Butter also makes the burn more painful and increases the chances of infection.

Another myth is to apply ice directly to the wound. Direct exposure to intense cold damages the tissue and skin. Its possible to burn the skin if you expose it to intense cold.

## Know the degree

The first step to proper treatment is to identify the severity of the burn as first-or

second-degree.

When a first-degree burn, a blush appears on the skin surface. The outer layer of the skins reddens. Since a first degree burn involves only the outer layer of skin, damage is superficial.

A second-degree burn goes deeper into the dermal and epidermal layers of the skin. The skin swells and blisters. The main distinction between a first- and second-degree burn is blisters. It's hard to identify the burn when blisters show up later. If this is the case, the source and duration of the burn help determine the severity of the burn. If the blister breaks, the open wound becomes more vulnerable to infection. As a result, a second-degree burn is potentially more dangerous.

According to Dan Dziewicki, supervisor of paramedics at Inland steel in East Chicago, Ind., proper treatment depends on the wound. Although some second-degree burns don't require medical attention, some first-degree burns do.

The total body area affects the severity of the wound. If more than 30 percent of the body has sustained a burn, the victim needs medical attention.

The area of the body also has a significant impact on the seriousness of the wound. A burn on the face, hands, feet or groin is critical and requires immediate medical attention. A burn on the face is hazardous because hot air may have singed air passages, which can restrict respiration.

The victim's age, health and health history are also important when you assess the severity of the burn and determine proper treatment.

#### Put the sizzle on ice

The best way to treat minor burns (and prevent blisters) is to cool them with cold applications, soothe them with ointments and protect them from infection with bandages. Refer to the following guidelines for proper treatment:

Flush the burn immediately with cool water or apply a cold pack for 15 to 30

minutes. Use a barrier between the cold application and the skin. Cold applications will decrease the heat of the burn, prevent swelling of surrounding tissue and provide some immediate relief. For burns that require medical attention, treat with cool water or cold applications only. The emergency center will have to scrub off creams, ointments and other "burn remedies." This is a very painful procedure. After medical treatment, the victim may use prescribed medications on the wound.

- To diminish the threat of infection, clean the wound daily with soap and water or a preparation of half hydrogen peroxide and half water. After you clean the wound, apply a thin layer of prescribed antibiotic ointment.
- After you apply the ointment, cover the wound with a sterile bandage. Change the bandages two or three times daily to promote healing and prevent infection.
- Closely watch the wound for any signs of infection. If the area around the burn becomes red, throbs with fever or oozes with pus, seek medical attention.
- To reduce the risk of first- and seconddegree burns, wear protective clothing and equipment at all times.
- Watch for signs of physical shock. Symptoms include clammy skin, dizziness and nausea.

Identify potential hazards in your workplace to help reduce accidents that result in first- or second-degree burns. Know how to treat even minor burns. You can't be too safe.

Reprinted from the September 1990 issue of Today's Supervisor, published by the National Safety Council

# Substance abuse treatment helps save lives

Keith: 'When I was usin' and drinkin', I found out what it feels like to hurt inside and have no place to go.'
Mark: 'There were times when I would come to work and I would be stoned. But I had been there long enough to know the ropes you know, so to speak, so I could get around it.'
Armondo: 'Well, marijuana slows you down. And it's bad especially if you're doing it and you come to work and you could hurt somebody big time.'

These are just three of the rehabilitated employees featured in a new videotape, "What Am I Worth?" that depicts actual mining cases in which employees share their experiences using alcohol and drugs. The video points up what companies and unions are doing through Employee Assistance Programs (EAP) to eliminate these abuses and rehabilitate affected workers.

The 38-minute video was produced by the Mine Safety and Health Administration (MSHA) in cooperation with the Mining Industry Committee on Substance Abuse, a group of management, labor and government representatives formed to work on drug and alcohol problems. Funded by a grant from the Anti-Drug Abuse Act of 1986, the tape features EAPs at sites of three AMC member companies: the Homestake Mining Company mine in Lead South Dakota; the Utah Power and Light Company mine in Huntington, Utah; and the IMC Fertilizer Group Inc. mine in Carlsbad, New Mexico.

MSHA and the committee conducted the Survey of Substance Abuse Programs in the Mining Industry on over 3,500 mines. The need for more tools to fight the treat of substance abuse to the safety of mining employees led to production of the video and research study of MSHA.

MSHA's policy specifies that "substance abuse is a treatable disease." Industry has responded to the growing problem of drug and alcohol abuse by developing EAPs to protect the health and welfare of its employees. William

Tattersall, Assistant Secretary of Labor for Mine Safety and Health, stated that EAPs "link companies and unions to the trained professional resources needed to deal effectively with workers who have problems involving alcohol, drugs or family matters."

EAP's provide a comprehensive, confidential and voluntary means of treating employees and their families through counselling or treatment. EAPs are available for employees with problems other than substance abuse, which also could interfere with their performance on the job. Although a successful program should start with an effective EAP, according to the video, the mine with a formal EAP is the exception rather than the rule.

Billie B. Turner, Chairman and Chief Executive Officer of the IMC Fertilizer Group Inc., featured in the MSHA video synthesizes the views of many industry leaders by his affirmation of substance abuse programs: "A distracted employee is not going to be the safe, conscientious, alert employee that we're looking for in the workplace."

The video focuses on employees who have been treated for substance abuse and the people who administer the EAPs. Keith, one of Homestake's employees, attended treatment and aftercare and described the EAP as giving him a "direction" in life. A well-run EAP gives the troubled employee an opportunity to overcome problems, improve personal relationships and maintain employment with the company.

The industry survey revealed that the EAP programs: develop policy to deal with substance abuse, train personnel to run the program, and develop methods of detection and procedures for dealing with

the problem once it is detected. Referrals to EAPs are voluntary unless an employee has tested positive to drugs following an on-the-job accident or testing for cause. The committee recommends that an EAP be in place and operating before a substance abuse testing and screening program is considered.

The industry is highly mechanized and demands a very skilled and specialized workforce to operate the large machinery and equipment, and the cost of replacing employees who are fired or injured is "difficult, time-consuming and expensive," according to the survey by MSHA, Ralph Tibble, Assistant General Manager for Homestake's Lead mine, notes in the video that money and effort are put behind the project because a "rehabilitated employee is a real good employee."

Rick Boyle, Local Union President at the Utah Power and Light Company, and a featured spokesperson in the video, said that the union was opposed to drug screening as there is a "potential for abuse." Utah Power and Light's EAP Supervisor,

Don Childs, said in the video that the "intention of this program was to try to get the union and the individual employees to have confidence that the program was going to work...and was not going to discriminate towards management or the workforce."

A significant aspect of the EAP is the attempt to involve all employees. The survey revealed that often management is excluded from the treatment and counselling programs even though it is clear alcohol and drug abuse is prevalent at all levels.

MSHA shows the magnitude of its initiative in the closing lines of its videotape, "What Am I Worth?": "It's not just a question of goodwill, or community responsibility or even morality. It's a question of lives." —Jill Richardson

The video "What AM I Worth?" (\$12) and the research study on substance abuse in the mining workplace (\$3) can be purchased from the Business Office, National Mine Health and Safety Academy, P.O. Box 1166, Beckley, WV 25802-1166,; 304/256-3206.

# The job safety analysis process: A practical approach

## Introduction

Job Safety Analysis (JSA) is a technique to review a job to identify inherent or potential hazards which may be encountered in the work environment. This technique enables miners and supervisors to work together to identify hazards and to develop step-by-step procedures that make up the safest, most effective way of completing a major task.

The Instruction Guide and Videotape described in this brochure are intended to

help you present training to mining industry personnel on the job Safety Analysis process. The instruction Guide is designed to be used in conjunction with the video tape. It may, however, be used separately.

#### **Instruction Guide:**

The Job Safety Analysis Process: A Practical Approach—IG 83

This Instruction Guide contains three major sections:

I. Leaders Guide The Leaders Guide contains the instructional material necessary to teach the Job Safety Analysis process. This guide includes a column with instructor notes which provides suggestions, page numbers where information is located in the Participants Guide, and references to visuals that can be used for instruction. An instruction column is included with text material that corresponds to the Participants Guide.

II. Visuals The materials in this section can be made into visuals (transparencies). These visuals follow the Leaders Guide

and Participants Guide.

III. Participants Guide The Participants Guide is intended as an instructional handout and reference for each person who attends Job Safety Analysis training. You may want to order additional copies of the Participants Guide.

# Videotape:

The Job Safety Analysis Process: A Practical Approach (15 min). VC 885

MSHAhas produced a 15-minute videotape titled **The Job Safety Analysis Process: A Practical Approach**. This videotape discusses the JSA process. It helps the viewer to determine which jobs need to be selected for JSA analysis, to separate jobs into basic steps for JSA analysis, to identify the hazards associated with each job step, and to use methods to control each hazard.

# **Ordering Information**

A single copy of the **Job Safety Analysis Process: A Practical Approach** (IG 83) is available free-of-charge. Multiple copies cost \$2.00 each. Multiple copies of the Participants Guide only can be ordered for \$1.00 each.

The Job Safety Analysis videotape (VC 885) is available in three formats. The 1/2 inch VHS and Beta videotapes cost \$12 each and the 3/4 inch U-matic videotape costs \$20 each.

To order this material, please complete the attached order form and return it to the Academy. If you are ordering the videotape and/or multiple copies of the instructional material, please enclose a check payable to Mine Safety and Health Administration. You may also submit a purchase order and you will be billed later.

<b>&amp;</b>	Order	Form	
Instruction Guide:	(No. of Copies)	Video Tape:	(No. of Copies)
IG 83 The Job Safety Anylysis Process: A Practical Approach (Includes: Leaders Guide Visuals, and Participants Guide) Single copy free-of-charge Multiple copies \$2.00 each  Additional copies of Participants Guide Only \$1.00 each		VC 685 The Job Safety Analysis Proces A Practical Approach (15 min).  1/2 Inch VHS @ \$12.00 each  1/2 Inch Beta @ \$12.00 each  3/4 Inch U-Matic @ \$20.00 each	
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# Congress & Exposition VISION '90s

# National Safety Council Congress & Exposition

October 28-November 1, 1990 Las Vegas Convention Center Las Vegas, Nevada

Congress at a glance
Saturday, October 27
Registration Opens
Council Division and Section Committee Meetings

#### Sunday, Octobsr 28

Council Division and Section Committee Meetings Blockbuster Education Sessions Specialty Programs

#### Monday, October 29

Opening Session and Annual Business Meeting Exposition Opens Blockbuster Education Sessions Specialty Programs

#### Tuesday, October 30

Early Morning Session
Exposition
Keynote Session
Blockbuster Education Sessions
Specialty Programs

#### Wednesday, October 31

Early Morning Session Exposition Keynote Session Blockbuster Education Sessions Specialty Programs

#### Thursday, November 1

BlockbusterEducationalSessions Professional Development Seminars

#### Friday, November 2

Professional Development Seminars

#### National Safety Council exhibition highlights:

The National Safety Council annual Exhibition provides an excellent opportunity for you to become familiar with many of the tools of your profession. You can see products demonstrated, compare costs, get answers to problems and learn about new developments in, and uses for, products you already have.

Make sure you take time to visit the National

Safety Council's booths (640 and 740) because many new products, programs and services will be highlighted this year. Here are a few that we're sure you'll be interested in checking out:

- Programs Department will introduce a new technological breakthrough in defensive driving education. You'll be able to see the popular DDC-8 program demonstrated on interactive video using the IBM InfoWindow Interactive computer system.
- First Aid Training Also premiering will be the Institute for First Aid Training Program, developed by the Community Department. The institute will train and certify instructors and teach first aid and CPR courses for both on- and off-the-job needs.
- Traffic Safety The Traffic Safety Department will be available to answer questions about the Alcohol Server Knowledge (ASK) Program, which is designed to train alcohol servers/sellers in how to recognize alcohol impairment and successfully discontinue service to the patron.
- Publications If your safety training needs fall into more traditional areas, other products displayed will be a new line of supervisor/employee booklets-totally redesigned into a new format and also affordably priced. In addition to the booklets, you can view a wide variety of safety posters, upgraded incentive items, more than 25 technical manuals and our large assortment of magazines and periodicals.
- Loss Control Loss Control Consulting staff can help you design custom safety programs, and the Safety Training Institute will be more than happy to discuss its many new courses being held at both onand off-site locations.
- Research If you need research or statistical information, representatives from the library will be available to assist you.

#### Membership

As always, the Membership Division will be at the booth to help you renew your membership, welcome new members and answer questions you have about the Council.

#### Just Stop By

With three full days of exhibiting, we look forward to your visit at the Council's booths-feel free to just stop by and say hello or take this time to plan your company's buying needs for the next and future years.

# The Last Word...

"We shouldn't try to do something better until we first determine whether we should do it at all." (Dwight D. Eisenhower)

"Wise men make proverbs but fools repeat them." (Samuel Palmer)

"There's nothing wrong with teenagers that reasoning with them won't aggravate." (Unknown)

"It is better to know some of the questions than all of the answers." (James Thurber)

"It is only possible to live happily ever after on a day to day basis." (Margaret Bonnano)

"They say you can't do it, but sometimes it doesn't always work." (Casey Stengel)

"Hope is the feeling you have that the feeling you have isn't permanent." (Jean Kerr)

"A billion here, a billion there—pretty soon it adds up to real money." (Everett Dirksen)

"Hard work never killed anybody, but why take the chance?" (Edgar Bergen via Charlie McCarthy)

"I should have been a country-western singer. After all, I'm older than most western countries." (George Burns)

"Good advice is one of those insults that ought to be forgiven." (Unknown)

**NOTICE:** We will welcome any materials that you submit to the Holmes Safety 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 1990 is underway – please remember that if you are participating this year, you need to mail you quarterly report to:

Mine Safety & Health Administration Educational Policy and Development Holmes Safety Bulletin 4015 Wilson Boulevard, Room 531 Arlington, Virginia 22203-1984

Phone: (703) 235-1400



# Holmes Safety Association Officers and Executive Committee 1990-1991

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Fourth Vice President		Joseph Forte	P <i>F</i>	Supplier
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Ford B. Ford	Fed	MS & H Review Comiss	DC	Chairman
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Douglas K. Martin	State	Dept. of Mine Inspection .	AZ	Mine Inspector
Ivan Moreton	Mgt .	Inland Steel Coal Co	IL	Safety Director
Robert Nelson	Fed .	MSHA, Coal Mine S & H .	PA	.Supervisory Inspector
Bob Scaramzzino	Labor	UMWA.	DC	Deputy Administrator
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		MSHA, Coal Mine S & H .		
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# Joseph A. Holmes Safety Association Awards Criteria

## Type "A" Awards - For Acts of Heroism

The awards are medals with Medal of Honor Certificate.

## Type "A" - For Acts of Heroic Assistance

The awards are Certificates of Honor.

# Type B-l Awards - For Individual Workers

(40 years continuous work experience without injury that resulted in lost workdays)

The awards are Certificate of Honor, Gold Pins and Gold Decal.

## Type B-2 Awards - For Individual Officials

(For record of group working under their supervision) The awards are Certificate of Honor.

## Type C Awards - For Safety Records

(For all segments of the mineral extractive industries, meeting adopted criteria)

The awards are Certificate of Honor.

#### Other Awards - For Individual Workers

(For 10, 20, or 30 years without injury resulting in lost workdays) The awards are 30 years - Silver Pin and Decal, 20 years - Bronze Pin and Decal, 10 years - Decal bearing insignia.

## Special Awards - For Small Operators

(Mine operators with 25 employees or less with outstanding safety records)

The awards are Certificate of Honor.

For information contact: Secretary-Treasurer, Joseph A. Holmes Safety Association (304) 256-3245

# Joseph A. Holmes Safety Association Awards Criteria--Outline

#### Type "A" Awards - For Acts of Heroism

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Type "A" - For Acts of Heroic Assistance

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(Mine operators with 25 employees or less with outstanding safety records)
The awards are Certificate of Honor:

Contact: HSA Office

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