
BULLETIN



March 1992





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

KEEP US IN CIRCULATION

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

Welcome new members

NAME	CHAPTER NUMBER	LOCATION	NAME	CHAPTER NUMBER	LOCATION
Heartland Coal Company	9574	Harts, WV	B & H Mining, Inc.	9599	Warfield, KY
Wayne County River	9575	Kenova, WV	Virgin Islands Chapter No. 2	9600	St. Croix, USVI
Wilder Coal Corp.	9576	Wise, VA	Acadian Chapter	9601	Baton Rouge, LA
Dale Coal Inc.	9577	Glen Daniel, WV	Stott Consulting	9602	Negaunee, MI
Crook County	9578	Sundance, WY	Cub Branch Mining, Inc.	9603	Dunlow, WV
Bird Springs Materials	9579	Las Vegas, NV	Blue Circle Cement (Quarry)	9604	Ravena, NY
Durga Resources, Inc.	9580	Jenn, NV	Peoria Concrete Construction	9605	Roanoke, IL
Madison Materials Summit Plant	9581	Guntersville, AL	Gifford - Hill Cobb Plant	9606	Seagoville, TX
Jones Mill Quarry	9582	Bismark, AR	Pan Mining, Inc.	9607	Riverside, NV
Glen's Excavating	9583	Tooele, UT	Sodder Trucking Co., Inc.	9608	Alloy, WV
Ohio Division of Mines Dist. 1	9584	Hopedale, OH	Sandra Hall Training	9609	Virgie, KY
Glens Falls Cement Quarry	9585	Glens Falls, NY	Kaman Industrial Technologies	9610	Albany, NY
Roaring Fork No. 2	9586	Dante, VA	Dudek Mine	9611	Barnesville, OH
Camp Branch No. 1	9587	Carrie, VA	T. L. James & Company, Inc.	9612	Kenner, LA
J & E Coal Company, Inc.	9588	Honaker, VA	Diversified Drilling Services	9613	Eldorado, AR
Franklin Mineral Products	9589	Hartwell, GA	Diversified Drilling Services	9614	Malvern, AR
Blue Circle Cement Plant	9590	Ravena, NY	The Alamo's	9615	San Antonio, TX
Fisher Industries Plant #23	9591	Sundance, WY	Acme Brick No. 1	9616	Mc Queeney, TX
Capital Security	9592	Coushatta, LA	Acme Brick No. 2	9618	Kanopolis, KS
ANCO	9593	Baton Rouge, LA	Dixie Plant	9619	Jamestown, LA
ORMET	9594	Burnside, LA	Acme Brick No. 3	9620	Weir, KS
Virgin Islands Chapter No. 1	9595	St. Croix, USVI	Acme Brick No. 4	9621	Sealy, TX
Patriot Mine	9596	Owensboro, KY	Acme Brick No. 5	9622	Millsap, TX
Black Gold No. 1	9597	Greenville, KY	Acme Brick No. 6	9623	Tulsa, OK
Sanco Materials Co., Inc.	9598	San Angelo, TX			

Study indicates smoking cessation improves workplace absenteeism rate

Employee assistance programs that help workers stop smoking can save companies money

By Susan E. Jackson, MA; David Chenoweth, PhD; E.D. Glover, PhD; Don Holbert, PhD; David White, EdD, East Carolina University, Greenville, North Carolina

The Surgeon General has concluded that cigarette smoking is the single most preventable cause of death and disability in the United States. Cigarette smoking has many adverse effects on health, and the causal relationship between cigarette smoking and disease is based on the prevalence of disease in relation to cigarette use.

In economic terms, estimates of the cost of smoking-related diseases range from \$17 billion to \$42 billion annually. These figures include direct healthcare costs, indirect mortality costs, and indirect illness costs.

"Excess" work-loss days for smoking and formerly smoking employees account for an estimated 21 percent of the annual work-loss days in the United States. S. Horowitz reported in 1986 that the average smoker misses 2.2 more days from work per year than the average non-smoker. Obviously, this places a financial strain on employers, with estimates of the annual costs of absenteeism ranging from \$2.7 billion to \$7.7 billion. Some companies pay as much as 25 percent of their entire payroll on absenteeism-related costs.

Van Tuinen and Land found that smokers in 1986 took 5.3 hours sick leave per month, while non-smokers took 4.3 hours per month. A 1987 study also found a strong relationship between cigarette smoking and absenteeism. The target

populations observed in both of these studies included smokers and nonsmokers, but not ex-smokers.

New research

A study undertaken to determine the relationship between stopping smoking and absenteeism included three central questions:

- Is there a difference in ex-smokers' absenteeism before and after stopping cigarette smoking?
- Is there a difference in absenteeism between cigarette smokers and ex-smokers?
- Among those who stop smoking, is the absenteeism rate related to the number of cigarettes smoked?

The population studied consisted of full-time employees in an eastern North Carolina pharmaceutical company with a work force of 1,400. The population is primarily white, with 45 percent male and 55 percent female. The employees have varied educational levels: 34.2 percent earned a high school diploma, 26.7 percent have some college credit, while 30.4 percent have a college degree.

The study used a time-series control group design to identify patterns of absenteeism between smokers and ex-smokers.

This design works well when previously collected data and projected data are accessible, or when program evalua-

tors can observe subjects periodically. The company's lifestyle-appraisal questionnaire, used annually by the medical department, provided data on employee smoking. The questionnaire includes demographic information as well as a limited family history and lifestyle behaviors like diet and exercise. Finally, the questionnaire includes specific questions pertinent to this study:

- the year the person began smoking;
- the number of cigarettes smoked per day;
- if and what year the person stopped smoking.

With permission from the company, the primary investigator reviewed the 734 lifestyle questionnaires administered in 1986 by the medical department. Based on these self-reports, 188 persons or 25.6 percent indicated they were current smokers, and 161 persons or 21.9 percent indicated they were ex-smokers who had stopped smoking since 1979, when absenteeism data was first available. Some evidence indicates the existence of a strong relationship between self-reports and abstinence from smoking among employees.

The investigator drew a systematic random sample from the stack of 161 ex-smokers' questionnaires by choosing every third person to yield a sample of 50 ex-smokers. Fifty current smokers were matched to this experimental group by age, race, gender, and number of cigarettes smoked per day. Each ex-smoker's year of smoking cessation was treated as the midpoint year for its matched smoker. Any time the investigator had a choice of employees to match with an ex-smoker, the person with the body weight closest to that of the ex-smoker was chosen. The resulting list of matched pairs, identified by employee name, was taken to the personnel department to obtain absen-

teeism data.

Employee absences are recorded based on the number of scheduled hours missed in the company's standard 40-hour work week. However, employees are allowed time off for specific conditions:

- personal leave, 16 hours per year;
- death in the family, 24 hours per year;
- other paid leave such as jury duty, unlimited hours per year.

The name and identification number on each absentee card were covered with tape to ensure anonymity. Each card was photocopied so that absence data could be coded into a computerized program. The information was coded to indicate each subject's number, pair number, ex-smoker or current smoker group number, age, gender, and race.

Absenteeism data by number of days missed from the scheduled work week for each subject were tabulated and adjusted to exclude all absences due to personal leave, death in the family, or jury duty. Subsequently, the number of days missed per year was identified throughout a period of 3 years prior to smoking cessation, the year the person stopped—the midpoint—and 3 years after stopping smoking.

Two factors dictated this time frame. First, research shows that the risk of death associated with cardiovascular illness does not begin to decline until the first year after smoking cessation. Second, this time frame is based, in part, on a worksite study that compared absences between non-smokers and smokers over a period of 20 months. That study suggests a longer time frame may be necessary to accurately determine the actual relationship between smoking cessation and absenteeism.

Results

The sample was originally to consist of 100 subjects. The absence of personnel records for the required time frame eliminated 28 percent of the study sample. Another 2 percent of the subjects were eliminated because of an excessive number of sick days—more than 90 above the average for one given year.

The subjects had been employed by the company for at least 7 years. The subjects were divided and matched to form 35 pairs. Approximately 77 percent of the sample was white; 23 percent, black. The overall mean age for the study group was 44 years; coincidentally, the mean age for both ex-smokers and smokers was 44.

None of the three analyses indicates a direct relationship between the number of cigarettes smoked and absenteeism in this work force.

But overall, the study revealed interesting data:

- There is a significant difference in absenteeism rates for the ex-smokers before and after cessation.
- There is a significant difference in absenteeism rates between ex-smokers and current smokers.
- There is no significant difference in absenteeism rates relevant to the number of cigarettes smoked per day.

This study is the first of its kind to examine the relationship between stopping smoking and absenteeism at an actual worksite. Although ex-smokers initially had more absences than smokers, their absence rates dropped significantly more than their counterparts in each of the 3 years after cessation. This indicates that the ex-smokers may have had some personal, medical, or organizational motivation to stop smoking. The

findings may also indicate that stopping smoking reduced the number of times each year that an employee was too sick to come to work.

Ex-smokers' absences also dropped slightly prior to stopping, suggesting that factors other than smoking may be responsible for the decrease in absence. Recent research strongly suggests that organizational commitment, stressful life events, physical symptoms, and upper respiratory tract infections may have a greater impact on absence than cigarette smoking. But the fact remains that cigarette smoking causes or contributes to each of these factors and should not be minimized in this particular research.

While a growing number of employers are prohibiting smoking, offering smoking cessation programs, and refusing to employ smokers, some researchers suggest such prohibitions and programs alone will not solve attendance problems. Nevertheless, cigarette smoking directly and indirectly influences absenteeism and carries huge economic consequences for employers. For example, Weis' 1981 cost estimates indicate that companies helping smokers to stop smoking enjoy cost-savings of \$220 in 1981 dollars per year, per smoker, in absenteeism alone. Due to the increased cost of labor since 1981, today's cost-savings would be much greater.

In essence, the findings of this study support the establishment of health promotion and smoking-cessation programs at the worksite to enhance employees' health and make them less prone to miss work.

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Holmes Safety Association

Monthly safety topic



Fatal machinery accident

GENERAL INFORMATION: A 38-year-old welder with 18 years of experience was fatally injured when the rotary breaker he was working in was accidentally energized, resulting in fatal crushing injuries.

The preparation plant employs 34 persons on two production shifts and one maintenance shift per day, 5 days per week, producing approximately 8000 tons of clean coal per day.

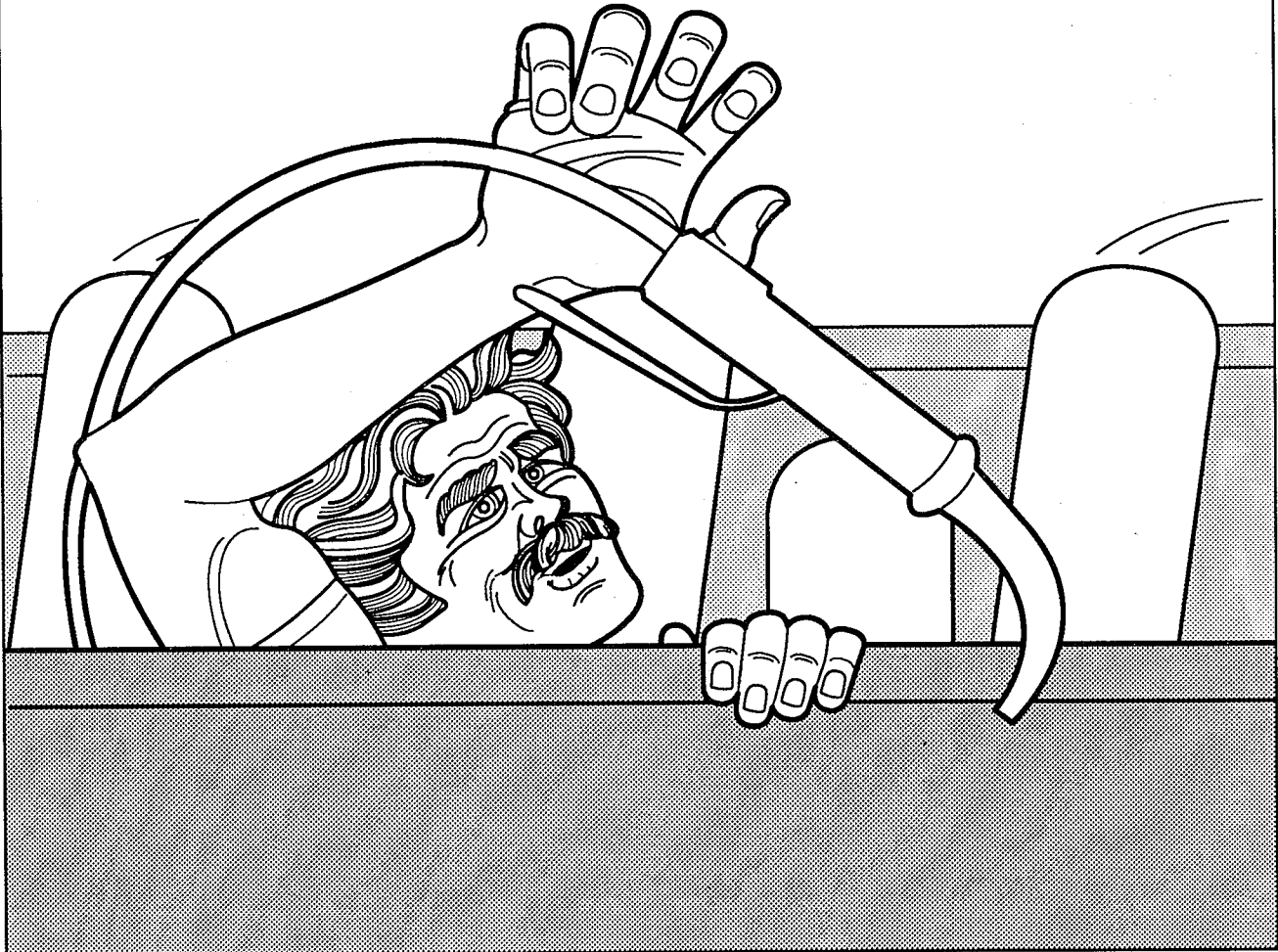
DESCRIPTION OF ACCIDENT: The first shift maintenance crew reported to work at 10:30 p.m. Work progressed normally until the time of the accident. At approximately 4:00 a.m., the victim (a repairman) and a welder arrived at the breaker to perform maintenance work inside the rotary breaker. The two-man crew began to position the rotary breaker for ease of maintenance. The welder positioned himself at the remote jog/stop switch in order to move the machine by use of power. The victim positioned himself in front of the open doors at the discharge end of the machine, in order to direct the welder to stop the machine at the proper moment. Although the remote jog/stop switch was located near the feed end of the machine, each man could be seen by the other. When the two men were in position, they maneuvered the machine into the proper work position.

Next, the welder went to a paging phone and called for assistance. The plant electrician, who was *not* familiar with the procedure, answered the page and was told to "kick the breaker." The electrician assumed that the welder wanted the rotary breaker jogged into position. The electrician pressed the start button for positioning of the rotary breaker and quickly pressed the stop button. The welder, seeing the machine start, realized that there had been a breakdown in communication. He yelled to the victim in order to determine his location. Hearing no response, the welder ran to the phone to have the electrician stop the machine. Meanwhile, the electrician, hearing no response regarding the positioning of the machine, repeated the sequence causing the breaker to be set in motion a second time. Arriving at the phone, the welder instructed the electrician to stop the breaker and call the rescue squad—believing the victim to be injured. The welder found the victim lying in the breaker approximately 4 feet from the discharge end.

The foreman heard the rotary breaker start and knew this was not normal. Overhearing the conversation on the mine phone, the foreman knew that someone had been injured and immediately called the rescue squad. He proceeded to the rotary breaker

Coal mine fatalities to date — thru 02-11-92

Type	1988		1989		1990		1991		1992	
	UG	S	UG	S	UG	S	UG	S	UG	S
Roof fall	—	—	4	—	1	—	1	—	3	—
Haulage	1	3	—	—	2	—	—	—	—	—
Machinery	—	—	—	1	1	—	—	—	—	—
Electrical	—	—	—	—	2	—	—	—	—	—
Other	1	—	—	2	—	3	2	3	—	—
Total	2	3	4	3	6	3	3	3	3	—



building. The rescue squad technicians examined the victim and found no signs of life. The medical examiner pronounced the victim dead upon arrival at the hospital.

CONCLUSION: The accident occurred as a result of the victim entering

a piece of stationary machinery without making sure that the unit was electrically de-energized, tagged, locked out, and secured against motion. A contributing factor was a breakdown in communication between the three persons involved.

The key issues of safety and health

The safety manager's task can be summed up in two phrases: risk control and cost control. Here are seven guiding principles.

By Stanley E. Jones

Managers are confronted with a broad range of health and safety concerns that embody all aspects of employees' lives. These include accident prevention, employee stress, toxic materials, air and water emissions, and solid waste disposal.

While all are important issues, this discussion will concentrate on accident prevention—the nucleus of risk control and, of course, cost control.

One of the primary responsibilities of today's professionals and managers is to minimize accidents and provide a healthy and safe work environment for employees. The bottom line is that those responsible for safety are like everybody else in the company—they have to assist in ensuring the continued profitability of the business.

What is an accident?

We've all experienced accidents. Have you tried to find the bathroom during the night and stubbed your toe on the bed frame as you tried to creep out of the room in the dark, then limped into the dark hallway only to run into an open closet door that you or somebody else forgot to close? As you stood in that dark hall, your toe throbbing and your eyes watering from a bump on the nose, you were the unwitting victim of a typical household accident—a happening, or series of happenings not expected, foreseen, or intended.

The very word accident conjures up visions of unrelated, uncontrollable circumstances coming together in some sort of random fashion. It suggests fate and lack of responsibility. That's the way most people think of accidents. Safety and health professionals cannot afford to think like that, however. They are responsible for the safety and health of their employees—preventing accidents.

Typical company policies usually assign primary responsibility for protecting the health and safety of employees to operating management. These policies place a moral and legal imperative for risk control squarely on the managers' shoulders. Corporate policies also put the economic burden of accidents, cost control, right at their doorstep. Indeed, accidents are a direct and sizeable drain on the bottom line of any business. These policies presuppose that accidents are not random, uncontrollable events, but are largely preventable, and more important, manageable. But, to manage them, it is necessary to first understand the dynamics of accidents.

We have all heard of, and perhaps have even witnessed, a factory accident. What comes to mind is the worker who lost a limb, was gravely ill, or was killed while on the job. The stories are always graphic, always sad, and always costly to the worker, his family,

and the company.

The only way managers can stop catastrophic, disabling injuries or illnesses is to stop employees from stubbing their toes and bumping their noses. Small, seemingly insignificant plant accidents must serve as a red flag—a warning that a facility is out of control. If managers don't control the little incidents, accidents and their severity will escalate and will inevitably end in serious disabling injuries or illnesses, the loss of limbs, and sometimes death. If that happens, members of the management team will have to share the responsibility for the accident and consequences. This may be a hard concept to accept, but it is nonetheless true.

In the late 1920s, H.W. Heinrich, who many consider the father of industrial safety, was the first to apply statistical methods to the study of industrial safety. He conducted an extremely comprehensive study, which researched reports of 75,000 accidents and developed a relationship between levels of accidents. He found that for every 300 noninjury accidents that occur, one will be serious, resulting in disability or death. This relationship has held up in subsequent studies.

The conclusions are obvious. If the work environment generates a sufficient number of noninjury incidents, then the more serious disabling injuries or illnesses are going to follow arithmetically. This disproves the notion that accidents are somehow random, unpredictable, and uncontrollable—and thus not manageable.

Heinrich's study unquestionably proves that the only effective way to control risks is to reduce the less seri-

ous and noninjury-type incidents systematically. That's the key to risk control and cost control and that is where management attention should be focused.

Accident prevention

Now, all that is needed is a system—a program based on sound fundamentals to address the risk management needs. Safety and health managers cannot personally administer good safety and health programs in every individual operation 24 hours a day. Corporate staffs and professionals can provide company officers and managers with professional advice and counsel to help them meet their obligations, but that's all.

Regulations and legislation can't stop incidents either. They are just words on paper—words usually written in the gristle and blood of victims, but nonetheless reactions to situations that have already occurred. The only place accidents can be stopped is on the factory floor before they occur—risk control—and that is an operations manager's responsibility. The way to do this is to build a system based on seven proven fundamentals of any effective safety and health program. They are:

- **Assignment of responsibility.** There must be a clear delineation of responsibility and authority for all health and safety activities for each operational management level in the organization, and it should be clearly documented in position guides.
- **Recognition and control of hazards.** This is risk management, a systematic analysis of the workplace to assess and

then control risks and hazards.

- **Training and communications.** The training of employees, including the trainers, usually the first-line supervisors, is fundamental to accident prevention. All management personnel from the CEO to the operations managers must be encouraged to actively participate in the programming of the health and safety of their employees.

- **Safety and health rules.** They have to be practical, sound, documented, communicated, and enforceable. Rules should be fairly and uniformly applied at all levels of the operation.

- **Maintenance of a safe and healthy working environment.** Like a valuable piece of equipment, safety and health programs need constant checking and fine-tuning to be effective. Scheduled periodic reviews will keep programs sound.

- **Health services.** Doctors and nurses are a critical resource to the total program. There should be a function that conducts employee health evaluations, treats illnesses and injuries, and gets employees involved in counseling and back-to-work programs.

- **Measurement of effectiveness.** Each of the other elements should be reviewed periodically for its contribution to the total process and system.

If managers would take the seven fundamentals, develop a system, and apply common sense, they would have the basics of a program that will work. But the program needs a good system base, with formal management procedures for implementation, review, and action. It should encompass all employees, salary and hourly, and include

policies, procedures, work rules, training, communications, audits, and followup.

Systems can fail, however, if the integrity is not maintained. If any one part is allowed to weaken or fail, this could cause a chain reaction that could result in an accident and maybe worse—setting the stage for a big bang—a serious accident or disaster.

Once the system fails, and usually management does not know until there is an incident, the senior facility manager must set in place a review procedure immediately to look at every facet of the system to determine where it failed and why. It should not be the kind of review program that places the blame totally on the shoulders of injured employees and leaves it there. The program should scrutinize the total management system searching for all weak links, including perhaps: a good procedure but not communicated well; a work rule not enforced; apparent lip service by some part of management to the program; a guard left off a machine; a supervisor closing his eyes to horseplay; an employee cutting corners; or poor training.

With the answers in hand, the manager must then take whatever effective actions are necessary to prevent recurrence. Regardless of how small or insignificant an accident or incident may seem, every situation should be reviewed and scrutinized closely to ensure good risk control and the continued maintenance of system integrity.

Cost control

We have discussed at length risk control responsibilities, the fundamen-

tals of a system, and system criteria. It's now time to look at the second issue of safety and health — cost control.

An effective safety and health system can maximize the morale of the workforce and that always means a better product. It can foster a credibility for management that makes it easier to lead and that increases operational efficiency. All of that impacts positively and measurably on profit. Health and safety is a serious business. It is also a profitable business.

As professionals and managers gain responsibility for the profit and loss of their business units, they will begin to see how an investment in employee health and safety will contribute to cost control and add to the profit of that business unit. Before you can control cost, though, you have to know what the costs are.

It is difficult to fix a number on what an occupational injury costs an employer directly. It has been estimated in the United States to be between \$250 for a simple cut to \$250,000 and upwards for a major disabling illness. With rising liability costs, escalating medical costs, workers' compensation and disability payments, inflation, legal fees, and court awards, these numbers are probably a conservative estimate of the direct cost of an accident. If you factor in hidden indirect costs—including lost time by employees, management's time for accident investigation, selection and training of new employees, and interference with production — these costs can quadruple the direct costs.

They're all part of the baggage every accident carries, they all come with

a price tag attached, and the business picks up the bill.

Designing a system

To design a successful system, we need to accomplish certain immediate and long-range tasks. Managers can delegate the authority to accomplish these tasks to subordinates, but the system will always be the bosses' responsibility so they must stay actively involved. The first task is to examine injury/illness reports and isolate those areas where accidents seem to occur most frequently. By doing this, a hazard hierarchy or priority is established by operation and by process within each operation.

The next task is to conduct a job hazard analysis and critical health and safety audits of the processes and operations of concern for unsafe acts and unsafe conditions—two distinct areas. Not all unsafe acts and unsafe conditions result in accidents, but all accidents result from unsafe acts and unsafe conditions, usually in combination, both of which are system failures.

Remember, people by nature are risk takers and corner cutters. Prince Charles of England is quoted as saying that "there is enormous satisfaction in achieving something which is potentially hazardous and which requires concentration and self-discipline." In the working environment, we will find employees that don't concentrate or who are not self-disciplined. Those are the people we have to be concerned about. The facts are that every 3 minutes somewhere in the world one worker dies of an occupational injury or illness, and in every second that

passes at least three workers are injured. It is estimated that each year 180,000 workers meet their death and 110 million are injured in occupational accidents—quite a toll of human trauma.

When auditing unsafe conditions, it takes work and some hard observations. Many unsafe and unhealthy conditions are almost invisible because they've always been a part of the scene. They are hardly noticeable anymore. Managers and supervisors must be trained to be very objective and very critical in their observations and look for such things as inadequate guarding; congestion; disregard of warning systems; fire and explosion hazards; poor housekeeping; hazardous atmospheric conditions (gases, dust, fumes, vapors); poor illumination or ventilation; and excessive noise. After the previous steps have been completed, a manager can then identify the problems in real terms and with specific examples.

The next step in the development of a health and safety system is a review of the company's rules and operating procedures to see if the problems previously defined are adequately addressed. Most people follow the rules; they like to do it the right way. The questions are: Are the rules there for them to follow? Do they know the rules? Do they understand them? Are they enforced?

Once all this information is in hand, management can begin to develop a program that will fit the facilities' particular circumstances. The program must be directed at real problems with a real expectation of success. All too

often "canned" safety and health programs are instituted in facilities with all the good intentions, only to fail because they are not integrated into the total management system and not provided with adequate backing, resources, followup, and training.

Training, the most basic fundamental of all, must include training for foremen and supervisors. They are the leaders on the floor; they better know what they're doing. Training the trainers is essential to success.

Employee training should include how the equipment functions, how the processes operate, and how toxic materials should be handled. If employees learn how to do a job the safe way, they learn to recognize and avoid hazards. They must also be made aware of the penalties for not following prescribed procedures. Training programs should be structured and formalized so as to lend credibility and importance to them.

By the time you reach the end of the process, almost all of the pieces necessary to develop a specific, comprehensive health and safety management system are complete. Only one task is left—measurement, the seventh of the fundamentals listed earlier. Measuring is a vitally important but often overlooked part of any system. Conditions change rapidly—as a result of new equipment, new people, and new products. The continued success of a program is dependent on an effective measurement system. This will identify when to change, what to change, or if there should be change. Without measurement, a program will lose its effectiveness, and that's no program at all.

Put it all together

Managers following the above principles have delegated authority while staying involved; revised accident and illness reports to establish hazard hierarchy lists; conducted job hazard analyses and health and safety audits looking for unsafe acts and conditions; reviewed existing health and safety rules and procedures to make sure they are practical, understandable, and enforceable; provided training; and established measuring criteria to monitor progress.

They are now ready to implement a risk control and cost control system. The immediate steps taken are managing the problems and taking control of the relationship among man, machine, and environment. But the problems still have to be solved.

A long-range health and safety system will begin to attack the issues in a plant or factory at their very core. The system will begin the process of behavior modification relative to employee welfare, and prioritize its importance in relation to all functions. This is extremely important because safety and health cannot produce results if it is an on-again, off-again proposition. Company policies must be reviewed and modified, as necessary, to continually address health and safety issues. Ongoing communication of these policies and programs must be reemphasized on a regular basis to every employee to ensure that they are understood; that they are to be followed; and that they are for their benefit.

Safety professionals and managers must take stock of the company climate when joining a new facility. If it's adversarial, they have a responsibility

to work quickly to develop a team spirit. Managing health and safety must be everyone's job, and everybody must understand that. They must also open defined avenues of communication for the employees to express their safety and health concerns to management. It does not make good sense for a situation to develop into a costly loss or tragedy only to find that everyone knew about it except management.

No matter how good and well-trained supervisors are, or how responsible employees seem to conduct themselves, management must stay involved. Its authority and involvement are the glue that holds the health and safety system together and ultimately controls risks and controls costs. Employees should be encouraged to contribute. It's all too easy to make them think they are the problem, but all successful managers have them thinking that they're part of the solution. One needs to be creative.

As Heinrich put it so many years ago: "Accident prevention is both a science and an art. It represents, above all other things, control—control of man's performance, machine performance, and physical environment. The word control is used advisedly because it means prevention as well as correction of unsafe conditions and circumstances." It should also be emphasized that risk and cost control means management—in this case, safety management.

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The focus on safety topics

The United Steelworkers of America recently concluded its biannual (September 1991) International Health, Safety and Environment Conference in Chicago, Illinois. As always, the conference is set to address the workplace safety and health concerns of its delegates, drawing some 700 participants to this given conference from hundreds of varied industries.

While a mining caucus was held as one of the conference sessions to address some specific concerns of miners, it was invigorating to see the miners' interest in other subjects. Examples of such other subjects were chemicals in the workplace, the environment, and substance abuse. As diverse as these topics are, it is interesting to note that the FOCUS of each was as applicable to mining as it was to any other segment of general industry.

In regard to chemicals in the workplace, miners have a vested interest in this subject, given the increased use of chemicals in mining and the pending Air Quality and Hazard Communication standards for mining. As to the FOCUS of this subject, it is directed at the employer's responsibility to:

- (1) make each employee aware of all hazardous chemicals in his or her work area;
- (2) monitor the levels of exposure surrounding the process of use, handling, or storage of hazardous chemicals;
- (3) provide engineering controls where feasible or, where engineering controls are not feasible, all necessary and appropriate personal protective equipment ; and
- (4) establish a means to be made aware of less hazardous (substitute) chemicals for replacement in any given process of concern.

In regard to the environment, the FOCUS of this subject is straightforward, given the fact that "the environment outside the workplace is only an extension of the environment inside." Therefore, it must become the mission of management and workers alike to address conditions which affect our environment, at the source. But beyond the desire to establish a healthy work environment, the following are only a few of several reasons for such a mission.

First, we must protect our children's world, given that the greatest threat to our children's future may be the destruction of their environment.

Second, and counter to common assumption, protecting the environment ultimately protects our jobs.

Third, environmental issues are linked to all other issues confronting us. As essential as the health of the economy is to a worker, a healthy environment is essential to a healthy economy.

In regard to substance abuse, the FOCUS here is on the real answers to abuse of alcohol or drugs in the workplace. The real answers are education and employee assistance programs. These answers *have been proven* as:

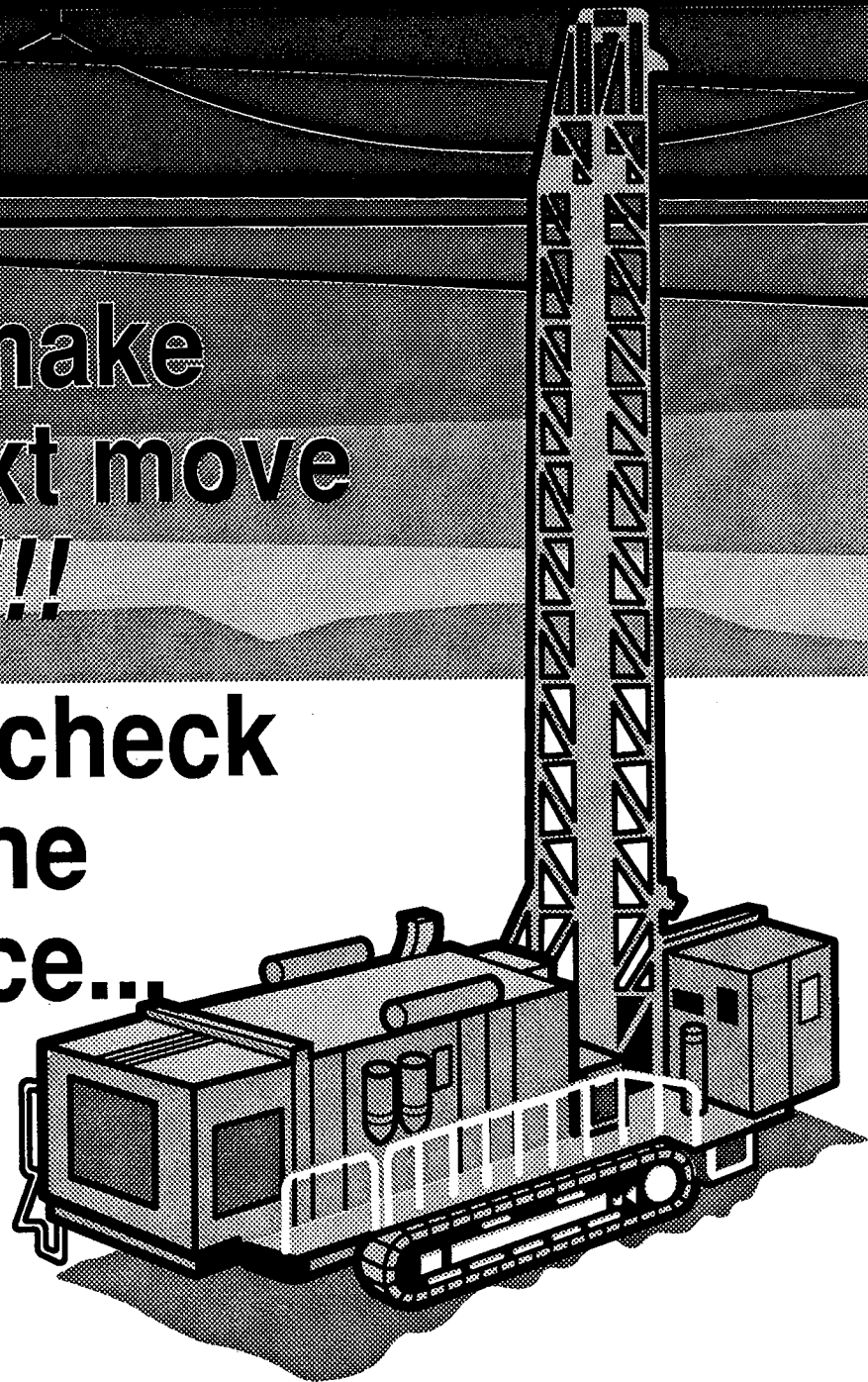
- (1) highly receptive to the general workforce;
- (2) a means for dignity for those with the illness of addiction;
- (3) cost-effective to the company; and
- (4) a benefit for society as a whole.

In summary, when addressing any given subject for any given workplace regarding safety, health, or environment, to FOCUS on the heart of the subject makes it applicable to any operation in our working world.

*Harry Tuggle, Safety and Health Specialist,
United Steelworkers of America.*

**DON'T make
your next move
the *last!!!***

**Double-check
powerline
clearance...**



Bent out of shape

Musculoskeletal injuries cost industry \$100 billion annually. A recent University of Michigan/NIOSH conference showed just how difficult solving this workplace epidemic will be.

By Gregg LaBar

Ergonomics is not really a concern for us here." That would be a tough case for any employer to make these days. He or she most certainly would have a difficult time convincing OSHA's Gerard F. Scannell.

"Musculoskeletal injuries are not just confined to a few industries like meatpacking or poultry processing," said Scannell, assistant secretary of labor—OSHA. "They're in all manufacturing facilities... I believe [they are] in every workplace and every institution in this country." Even OSHA has its share of ergonomic problems, pointed out Scannell, noting that four agency workers have undergone carpal tunnel release surgery.

Musculoskeletal injuries—notably low back pain and upper extremity cumulative trauma disorders such as carpal tunnel syndrome and tendonitis—appear to be everywhere. Some 19 million American workers are disabled yearly by these injuries at an estimated total (direct and indirect) cost of \$100 billion. From 1981 to 1989, cumulative trauma disorders increased from 18 to 52 percent of all recorded occupational injuries and illnesses.

"Since 1982, this problem has demonstrated itself in truly pandemic proportions," according to NIOSH Director J. Donald Millar, M.D. In other

words, he said, we have a "mega-epidemic" on our hands.

Scannell and Millar joined a number of researchers and occupational health professionals recently at a 1-1/2-day conference, "A National Strategy for Occupational Musculoskeletal Injury Prevention—Implementation Issues and Research Needs," at the University of Michigan, Ann Arbor, Michigan. The conference, cosponsored by NIOSH and the University of Michigan's Center for Occupational Health and Safety Engineering, focused on the scope and causes of musculoskeletal injuries, ergonomic prevention strategies, and research needs.

Root of the problem

In the mid-1980s, NIOSH identified the 10 leading occupational injuries and illnesses. More than any of the others NIOSH identified, including cancer and lung disease, musculoskeletal injuries have proven to be "the most frustrating" to understand and prevent, Millar told the conference's 400 attendees.

Part of the problem, experts pointed out, is that low back pain (LBP) and upper extremity cumulative trauma disorders (CTDs) are not limited to certain jobs or industries. LBP, for example, can be caused by lifting, overexertion, pulling/pushing, throwing/carrying,

postural stresses, and falls. These activities might be found in jobs that require manual material handling, long periods of sitting, or patient handling.

Upper extremity CTDs are caused by repetitive motion, forceful exertion, vibration, and poor posture. Sources here vary from hand tools and high-speed assembly lines to VDTs and poorly designed office furniture. Upper extremity CTDs can affect the fingers, hands, wrists, elbows, arms, shoulders, and neck.

Why are musculoskeletal injuries so prevalent across a wide range of industries and jobs? Don B. Chaffin, Ph.D., professor of the University of Michigan's Center for Ergonomics, said the problem begins in the design of jobs, processes, and entire workplaces. He said 98 percent of graduating engineers have no ergonomic training and thus lack the knowledge to make the job fit the worker.

A general resistance to change on the part of employers and workers helps explain why back injuries still account for up to 40 percent of all workers' compensation costs, said Gary Herrin, Ph.D., professor of Industrial and Operations Engineering at the University of Michigan.

Many employers, Herrin added, still make the mistake of using weight as the ultimate, determining factor to separate safe from unsafe jobs. "We still have people putting workers on lifting restrictions," Herrin said. "The average industry person out there still doesn't understand the basic difference between lifting 30 pounds of feathers and 30 pounds of lead." The feathers, Herrin explained, are much harder to

lift because they have to be stored in a large, ungainly box. The 30 pounds of lead, on the other hand, forms one concentrated block of material.

Other problems noted by Herrin include a lack of practical guidelines and success stories to show employers what has and has not worked, and a strong work ethic that encourages workers to accept pain. A belief in natural selection also plays a role, Herrin said, explaining: "We just assume that the healthiest people are going to survive and the rest will go away. That's just not happening, however."

NIOSH's Millar blamed the epidemic of upper extremity CTDs on America's "one-way voyage into the computer age," whereby millions of visual display terminals have been put into use, resulting in many data entry jobs that involve 8 hours of repetitive motion.

"Many workers have been relegated to simple tasks that have dulled the mind, dimmed the spirit, and led to the dysfunction of the musculoskeletal system," argued Barbara Silverstein, Ph.D., research director for the Washington Department of Labor and Industries' Safety and Health Assessment Research Program (SHARP).

The high-tech, fast-paced jobs of today can be both physically and psychologically demanding, pointed out Steven Sauter, Ph.D., chief of NIOSH's section on motivation and stress research. "Perhaps we're making a mistake putting all of our marbles in the ergonomic basket," said Sauter, who estimated that as many as 6 percent of work-related musculoskeletal injuries are the result of psychological demands

alone. He cited a recent Australian VDT study which found that the social climate at work "overshadowed" postural variables when predicting musculoskeletal injuries.

Lawrence Fine, M.D., director of NIOSH's Division of Surveillance, Hazard Evaluations, and Field Studies (DSHEFS), said increased work pace and greater worker awareness of ergonomic issues are both part of the musculoskeletal injury picture. He said not only have jobs become faster and more repetitive in the name of efficiency and productivity, but also workers have become more aware of these injuries, are reporting them, and seeking medical care.

Prevention

The fact that musculoskeletal injuries are real and are being identified in epidemic proportions has led to a strong movement for prevention. Typically, musculoskeletal injury prevention focuses on three types of controls:

- *Administrative*, where the at-risk workers are excluded from, or limited in their time on, problem jobs.
- *Work practices*, where at-risk workers and at-risk jobs are juggled, and;
- *Engineering*, where at-risk jobs are altered to lower the risk of injury.

Not surprisingly, conference participants touted engineering controls as the most effective and permanent way to prevent musculoskeletal injuries. They offered case studies of how redesigned workstations, new processes, and new equipment resulted in fewer injuries, lower workers' compensation costs, and improved morale and productivity.

In these examples, management and labor worked together to identify problem jobs and develop solutions, some of which were simple and inexpensive and others of which required substantial planning and funding. NIOSH's Sauter cited an Aetna Life & Casualty study which showed that redesigned office furniture significantly reduced absenteeism and upper extremity discomfort while increasing productivity.

"There is no magic ergonomics bullet, but I think we're getting a lot of anecdotal evidence about some things that have worked," said OSHA's Scannell.

A second category of controls, work practices, include such things as worker training, job rotation, job redistribution, slowdown or shutdown of lines, and rest pauses. These can be effective, experts said, when supplemented with engineering controls or when used as an interim measure while jobs and work areas are being redesigned. They're seldom effective on their own, however, because they're difficult to track and because they rely on individual worker and work group actions.

Administrative controls, including preemployment and preplacement medical screening and medical questionnaires, generally are not helpful in preventing musculoskeletal injuries, said Gunnar Andersson, M.D., Ph.D., professor of orthopedic surgery at Rush Presbyterian-St. Luke's Medical Center in Chicago. Andersson's reasoning: Physical examinations, fitness tests, and X-rays do not measure parameters that could be considered indicative of a person's risk of suffering a back injury or cumulative trauma disorder.

At most, Andersson said, a fitness test, for example, will be an indicator of how well a person might recover from a musculoskeletal injury. A medical exam or questionnaire that reveals previous low back pain suggests the potential for future problems, given the fact that there is a 78 percent recurrence rate. However, basing a hiring or placement decision merely on the previous incidence of LBP would result in large numbers of people being excluded from such jobs.

Medical screening is fraught with legal and ethical equal employment opportunity concerns, NIOSH's Millar pointed out.

Rehabilitation

Because ergonomics is not, and probably never will be, capable of preventing all musculoskeletal injuries, treating and rehabilitating injured workers, and then reintegrating them into the workforce, are critical tasks.

Margareta Nordin, Ph.D., director of the ergonomic and occupational biomechanics program at New York University, stressed the importance of early intervention—getting workers to a medical professional as soon as possible, maintaining contact with workers throughout their rehabilitation, and trying to get them back to work in light-duty jobs.

Noting that rehabilitation of musculoskeletal injuries is "time-limited and goal-oriented," Nordin said employees who lose contact with the workplace for as little as 3 months are likely to be out of work longer than those who maintain contact, and may not return at all.

Experts said employees who know they have a job to return to are more likely to want to return to work. However, cautioned Stover Snook, Ph.D., ergonomics project director for Liberty Mutual Insurance Co., Hopkinton, Massachusetts, expecting injured workers to return to their same jobs without those jobs having been improved could be a mistake.

"There are many reasons for not returning to work," Snook said.

"We often blame workers, that they're all malingerers. That's not true. There are jobs that I've seen that I wouldn't be in a hurry to go back to either."

Knowledge gaps

Unfortunately, what experts know about musculoskeletal injuries is outweighed by what they need to know. Understanding and preventing back injuries, Rush Presbyterian's Andersson said during one of the conference question and answer sessions, is not "exact science." He said "we really have no clue" about what conditions and exposure levels are responsible for what ailments.

This lack of a dose-response model is even more apparent in regard to upper extremity injuries, according to Thomas J. Armstrong, Ph.D., professor of industrial and operations engineering at the University of Michigan. He said the interaction between CTD risk factors and body parts is not well understood. Consequently, each risk factor still has to be looked at individually, even though they generally occur together (for example, a VDT data entry job often requires repetitive motion on

a keyboard as well as prolonged sitting).

Another problem, cited by Sauter previously, is that psychological factors, such as stress, have not gotten much attention until recently. NIOSH is currently doing two studies in this area—charting the effect of work/rest schedules and electronic monitoring on VDT operators.

Experts also noted the problems associated with not being able to document how successful ergonomic initiatives have been. "If we cannot demonstrate that we're being successful, we will not have the support or resources we need," NIOSH's Fine said. He said this kind of information is especially important when trying to sell ergonomics to middle and upper managers. Many of them, he claimed, "think of the ergonomic solution as something that's costing them money," not saving

money, reducing workers' compensation costs, or improving productivity.

While hopeful that further study will help fill in the knowledge gaps, the experts weren't predicting major breakthroughs in the prevention of musculoskeletal injuries.

"We have to give ourselves a fair challenge," NIOSH's Fine said. "When we tackle a problem as serious as musculoskeletal disorders, we... need as much time as we would need for most any public health problem. But to say that we have to wait until we know everything... is to really say we will not act for a very long time."

Given the growing incidence of these troubling injuries, the conference panelists concluded, that would be a costly delay indeed.

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Danger in and around mines

Storage of explosives

Classes of explosives

Proper storage can prevent unauthorized access to explosive materials and reduce their deterioration. All explosive materials, including blasting agents, detonators, detonating cord, boosters, and blasting caps (electric and nonelectric), need to be stored in magazines. Magazines should be properly designed and located to comply with all applicable federal, state, and local laws, rules, and regulations.

Types of magazines

- **Type 1**—Permanent magazines for the storage of high explosives. Other classes of explosive materials may also be stored in Type 1 magazines.
- **Type 2**—Mobile or portable indoor and outdoor magazines for the storage of high explosives.

- **Type 3**—Portable outdoor magazines for the temporary storage of high explosives while attended (daybox).
- **Type 4**—Magazines for the storage of low explosives. Blasting agents, Class C detonators, safety fuses, squibs, igniters, and igniter cords may also be stored in Type 4 magazines.
- **Type 5**—Magazines for the storage of blasting agents.

Report lost and stolen explosives to:

Bureau of Alcohol, Tobacco, and Firearms
Call toll free: 1-800-424-9555

Reprinted from the May 1991 issue of Danger in and Around Mines, N.C. Department of Labor.

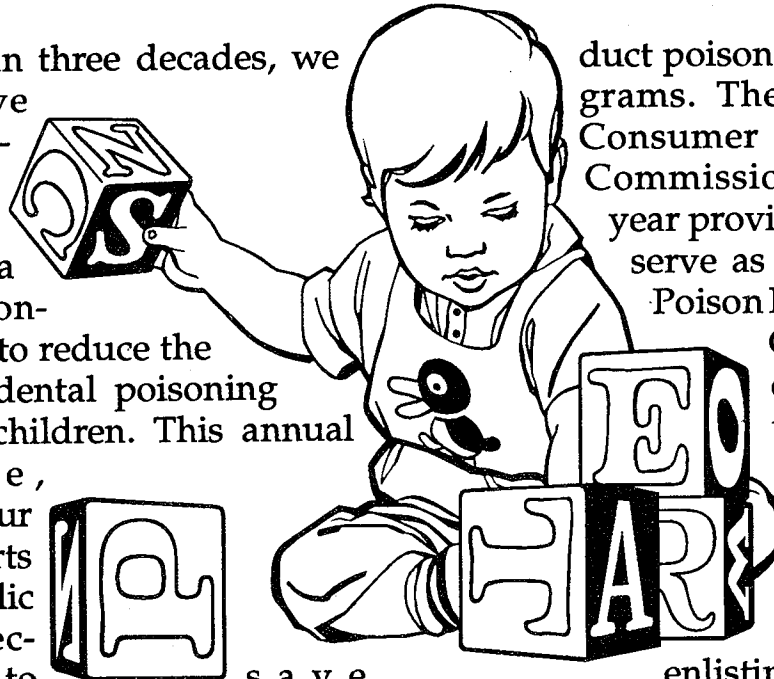
National Poison Prevention Week

March 15-21, 1992

For more than three decades, we Americans have observed National Poison Prevention Week as part of a concerted, nationwide campaign to reduce the number of accidental poisoning deaths among children. This annual observance, coupled with our year-round efforts in both the public and private sectors, has helped to save lives. During the past 30 years, the number of poisoning deaths among children under 5 years of age has declined markedly, from 450 in 1961 to 42 in 1988.

This "success story" certainly merits celebration. However, because the loss of even one child is more than any family can bear and more than our Nation should tolerate, we must continue to alert the public about the need for poison prevention.

Leading that effort today is the Poison Prevention Week Council, a coalition of 37 national organizations that are determined to protect the health and safety of our most vulnerable citizens. The Council, which embodies our public-private partnership for poison prevention, coordinates the annual observance of National Poison Prevention Week. It also distributes lifesaving information and encourages local poison control centers, pharmacies, health departments, and other agencies to con-



duct poison prevention programs. The United States Consumer Product Safety Commission, which each year provides a member to serve as Secretary of the Poison Prevention Week Council, helps to direct this important public health campaign to prevent childhood poisonings. It is truly a national effort, enlisting the help of parents, health professionals, educators, and government officials, as well as members of industry and the media.

Poison prevention awareness has saved lives, but there is more to do. The American Association of Poison Control Centers reports that almost 1 million children are exposed each year to potentially poisonous medicines or household chemicals. We must continue to warn parents, grandparents, and other adults about the threat of childhood poisoning and encourage them to adopt safety measures. We can take a simple yet vital step to prevent accidental poisonings by using child-resistant closures and by keeping medicines and household chemicals out of the reach of children.

George Bush
President of the United States

Reprinted from the Federal Register, Volume 56, No. 220, Thursday, November 14, 1991.

Holmes Safety Association

Monthly safety topic



Fatal powered haulage accident

GENERAL INFORMATION: A 29-year-old equipment operator, with 5-1/2 years of experience, was fatally injured when the ground beneath the right wheels of a front-end loader he was operating collapsed, causing the loader to overturn and fall about 8 feet to the level below.

The sand and gravel operation was operated one 8-hour shift per day, 5 days a week. A total of 3 persons was employed.

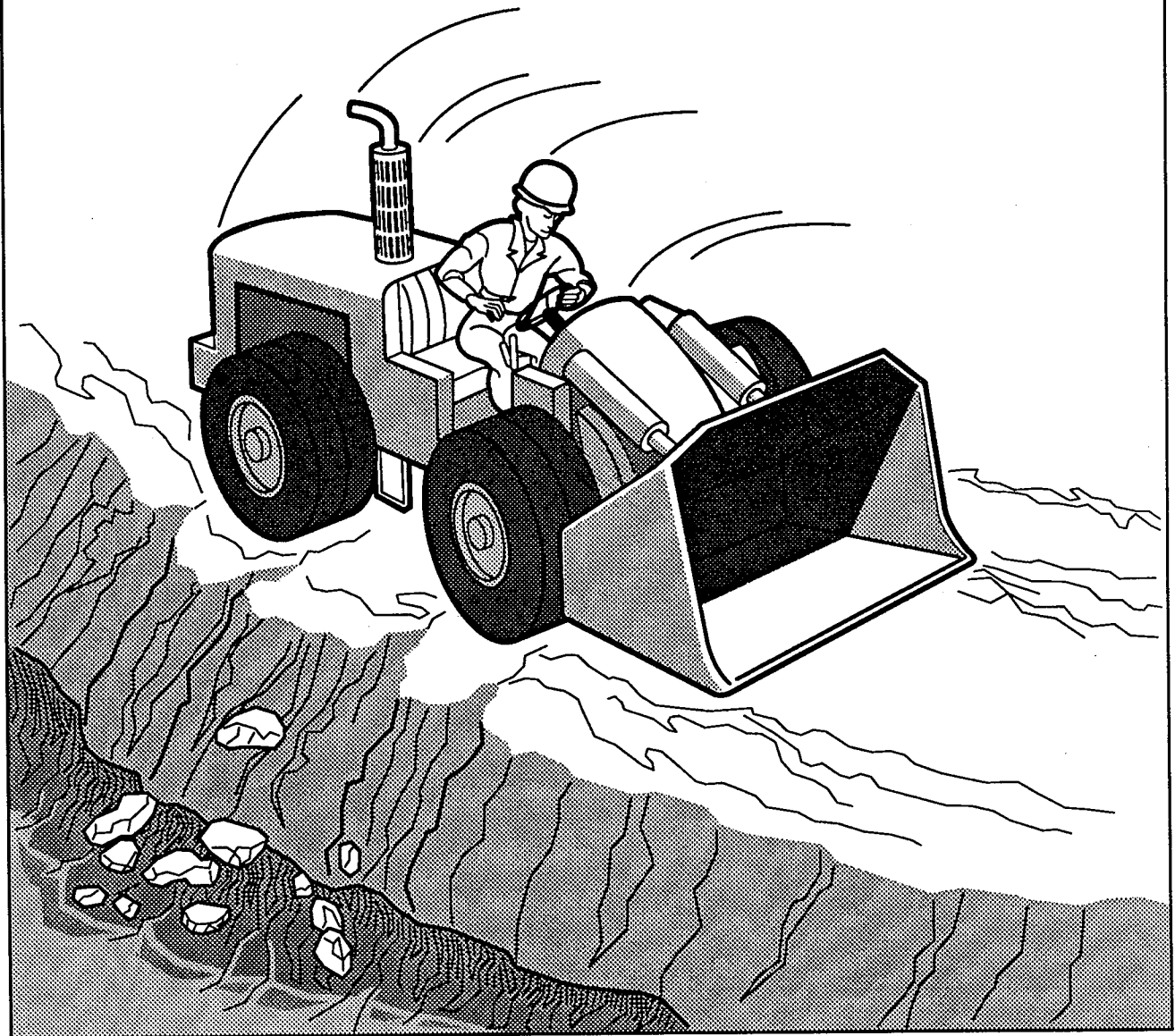
DESCRIPTION OF ACCIDENT: On the day of the accident, the victim reported for work at 7:00 a.m., which was his usual starting time. He, along with his co-worker, performed their regular duties as front-end loader operators. A new ramp was to be constructed, and the material from the existing ramp was to be mined and processed. The victim used his loader to extract and stockpile material, while his co-worker used his loader to process the stockpiled material. The front-end loader operated by the victim was a 1963 Caterpillar that was not equipped with roll over protection or a seat belt. This loader was being operated in violation of a 107(a) order of withdrawal that had been previously issued for not having adequate service brakes—the loader had been badly damaged when it had previously overturned and could not be tested for defects during the

investigation. During the morning, material was being removed from the base and alongside the ramp. As work progressed, the ramp was undercut and weakened by the removal of material. The ramp was constructed of compacted sand and gravel with about 12 inches of overburden. It was approximately 390 feet long, 30 feet wide at the widest point, and about 25 feet high at the top. The ramp sloped at about 15 degrees from top to bottom. Occasionally, the victim would also use the ramp to take a loader bucket full of waste material to the dump area.

Work progressed without incident until about 11:50 a.m., when the victim drove the front-end loader up the ramp. At the location where the material had been extracted, the ramp was at its narrowest point—about 20 feet wide. As the victim reached this area, the ground beneath the right wheels collapsed, and the loader fell about 8 feet to the pit floor and came to rest upside-down on top of the victim. The victim's co-worker, who was nearby, witnessed the accident and immediately went to the overturned loader, turned off the engine, and then summoned help. The county coroner arrived and pronounced the victim dead at the scene of the accident.

CONCLUSION: The direct cause of the accident was operating the front-

Metal and Nonmetal mine fatalities to date — thru 02-11-92										
Type	1988		1989		1990		1991		1992	
	UG	S	UG	S	UG	S	UG	S	UG	S
Electrical	—	—	—	—	—	—	—	1	—	—
Fall of roof/back	—	—	1	—	1	—	—	—	—	—
Haulage	—	1	—	1	—	3	—	—	1	—
Machinery	—	—	—	—	—	1	—	—	—	1
Other	—	—	1	5	1	—	1	1	—	1
Total	—	1	2	6	2	4	1	2	1	2



end loader in an area of the ramp that had become narrow, undercut, and weakened by removal of material. A possible contributing factor was operating the front-end loader without ad-

equate service brakes.

Contributing to the severity of the accident was the fact that the loader, a 1963 model, was not equipped with roll-over protection and a seat belt.

First aid



Part 1 of 3

Specific body area injuries

Head and eye injuries

Head injuries

Scalp wounds

Scalp wounds bleed profusely because of the scalp's rich blood supply. Look in the wound for skull bone or brain exposure, and for indentation of the skull.

- Control bleeding by gently applying direct pressure with a dry sterile dressing. If it becomes blood-filled, do *not* remove it, but add another dressing on top of the first one.

If a depressed skull fracture is suspected, apply pressure around the edges of the wound rather than at its center.

- Elevate the head and shoulders to help control bleeding.
- Do *not* remove an impaled object; instead, immobilize it in place with bulky dressings.

Skull fracture

A skull fracture is a break or crack in the cranium (bony case surrounding the brain). Skull fractures may be open or closed, as with other bone fractures.

Signs and symptoms

- Pain at the point of injury
- Deformity of the skull
- Bleeding from ears and/or nose
- Leakage of clear or pink watery fluid

dripping from the nose or ear. This watery fluid is known as cerebrospinal fluid (CSF). CSF can be detected by having the suspected fluid drip onto a handkerchief, pillowcase, or other cloth. CSF will form a pink ring resembling a target around the blood; this is also called the "halo sign."

- Discoloration under the eyes ("raccoon eyes")
- Discoloration behind an ear (Battle's sign)
- Unequal pupils
- Profuse scalp bleeding if skin is broken. A scalp wound may expose skull or brain tissue.

First aid for skull fractures is similar to that for a victim with a scalp wound (see above) or a brain contusion.

Concussion

A concussion comes from a blow to the head that results in a violent jar or shaking of the brain, causing an immediate change in brain function, including possible loss of consciousness.

Signs and Symptoms

- Loss of consciousness
- Severe headache
- Memory loss (amnesia)
- Seeing stars
- Dizziness
- Weakness
- Double vision

Degrees of concussion

Categorizing concussion helps the first aider to decide how to manage the victim. Concussions may be categorized as follows:

A *mild* concussion involves no loss of consciousness, but a disturbance of

neurological function.

A *moderate* concussion involves a loss of consciousness for less than 5

Concussion guidelines

Type	Description	Guidelines
Mild	Momentary or no loss of consciousness	Delay return to activity until medical evaluation has been made.
Moderate	Unconscious for less than 5 minutes	Avoid vigorous activity for a few days or longer. Resume activity only when associated symptoms of headache, visual disturbances, etc., have been resolved.
Severe	Unconscious for more than 5 minutes	Avoid rigorous activity for one month or longer. Clearance from a neurosurgeon is advised.

minutes, usually with the inability to remember events after being injured.

In a *severe* concussion, the loss of consciousness lasts more than 5 minutes and eye movements wander.

Contusion

Contusions are more serious than concussions. Both can be produced by hits or blows to the head. Contusions involve bruising and swelling of the brain, with blood vessels within the brain rupturing and bleeding. Inside

the skull, there is no way for the blood to escape and no room for it to accumulate.

Signs and symptoms

Similar to those of a concussion but more severe:

- Unconsciousness
- Paralysis or weakness
- Unequal pupil size
- Vomiting and nausea
- Blurred vision
- Amnesia or memory lapses
- Headache

First aid for concussions and contusions

Any head injury may be accompa-

nied by a spinal injury. If you suspect a spinal injury, keep the head, neck, and spine in the same alignment you found originally.

For unconscious victims

- Assume that all unconscious victims with head injury have a spinal neck injury. Open the airway by the jaw thrust method to check for breathing. Do not bend the neck. Give rescue breathing if needed.
- Stabilize the victim's head and neck as you found them, using your hands along both sides of the head or placing blankets and other soft yet rigid materials alongside the head and neck.

Head injury follow-up

If any of the following signs appear within 48 hours of a head injury, seek medical attention:

- **Headache.** Expect a headache. If it lasts more than one or two days or increases in severity, however, seek medical advice.
- **Nausea, vomiting.** If nausea lasts more than 2 hours, seek medical advice. Vomiting once or twice, especially in children, may be expected after a head injury. Vomiting does not tell anything about the severity of the injury. However, if vomiting begins again hours after one or two episodes have ceased, consult a physician.
- **Drowsiness.** Allow a victim to sleep, but wake the victim at least every hour to check the state of consciousness and sense of orientation by asking his or her name, address, telephone number, and an information-

processing question (e.g., adding or multiplying numbers). If the victim cannot answer correctly or appears confused or disoriented, call a physician.

- **Vision problems.** If the victim "sees double," if the eyes fail to move together, or if one pupil appears to be larger than the other, seek medical advice.
- **Mobility.** If the victim cannot use his or her arms or legs as well as previously or is unsteady in walking, medical care should be sought.
- **Speech.** If the victim slurs his or her speech or is unable to talk, a doctor should be consulted.
- **Seizures or convulsions.** If the victim has a violent involuntary contraction (spasm) or series of contractions of the skeletal muscles, seek medical assistance.

- Check for severe bleeding. Cover any bleeding with a sterile dressing. Do not stop the flow of blood or fluid from the ears. Stopping it could put pressure on the brain. Do not remove any object embedded in the skull.

- If there are no signs of a neck or spinal injury, try to place the victim in the coma position (on victim's side, knees bent, head supported on one arm).

For conscious victims

- Check for spinal injury by noting arm or leg weakness or paralysis; if you get little or no reaction when you pinch the feet and hands, there may be a spinal injury. Stabilize the head and neck as they were found to prevent movement.

- Do not block the escape of cerebrospinal fluid since it may add more pressure to the brain.

- Ask the victim what day it is, where he or she is, and personal questions such as birthday and home address. If the victim cannot answer these questions, there may be a significant problem. Another useful test is to give a list of five or six numbers and ask the victim to repeat them back in that order. Lists of objects can also be used as short-term memory tests. Failing on these short-term memory tests indicates a concussion.

- Keep victim in a semi-sitting position; do *not* elevate the legs since this increases blood pressure in the head.

- Do *not* give the victim anything to eat or drink.

Eye injuries

Penetrating injuries

Most penetrating eye injuries are fairly obvious. Suspect penetration any

time you see an eyelid laceration or cut. Often first aiders concentrate upon the lid injury and neglect the penetrating eye injury. A penetrating injury requires immediate medical attention.

- Do *not* remove foreign bodies impaled in the eye.

- Protect the eye with a paper cup or cardboard cone to prevent the object from being driven farther into the eye.

- Cover the undamaged eye with a patch in order to stop movement of the damaged eye due to sympathetic eye movement.

Blows to the eye

Apply an ice cold compress immediately for about 15 minutes to reduce pain and swelling. A black eye or blurred vision could signal internal eye damage. See an eye doctor immediately.

Cuts of the eye and lid

- Bandage both eyes lightly and seek medical help immediately.

- Do *not* attempt to wash out the eye or remove an object stuck in the eye.

- Never apply hard pressure to the injured eye or eyelid.

Chemical injury

- Flood the eye with warm water immediately. Use your fingers to keep the eye open as wide as possible. Hold the head under a faucet or pour water into the eye from any clean container continuously and gently for at least 15 minutes. Roll the eyeball as much as possible to wash out the eye. Do *not* use an eye cup.

- Loosely bandage both eyes. Seek medical help immediately after these

steps are taken. Alkalis cause greater concern than acids since they penetrate deeper and continue to damage longer. No matter how well the eye is irrigated, some alkali will remain, often for weeks, to cause tissue damage. A first aider cannot use enough water on these injuries. Huge amounts of water are necessary to provide adequate rinsing of the affected eye.

Forcible separation of the eye

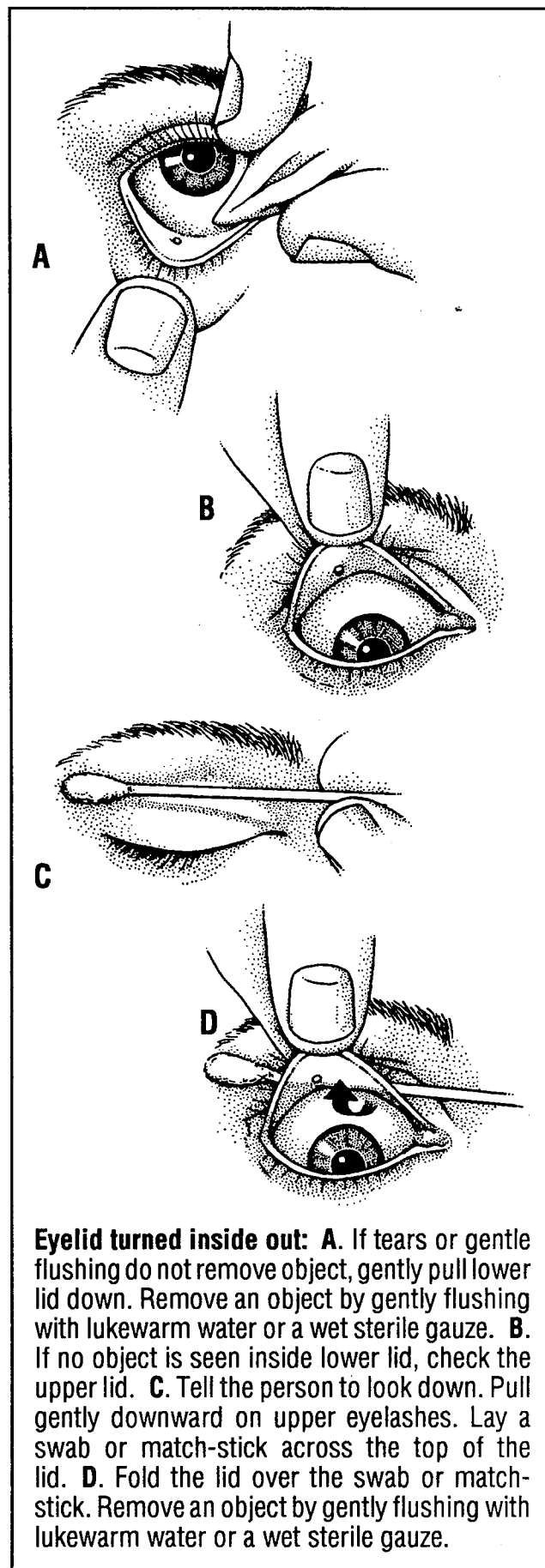
A blow to the face can cause an eye to come out of its socket.

- Do *not* attempt to push the eye back into the socket.
- Cover the separated eye loosely with a sterile dressing that has been moistened with clean water. Then cover the eye with a paper cup, using the same procedures for an impaled object in the eye.
- Cover the uninjured eye with a patch to prevent sympathetic eye movement in the damaged eye.

Foreign bodies

Foreign bodies in the eye are the most frequent cause of eye injuries. They can be very painful. Tearing is very common, as it is the body's way of attempting to remove the object.

- Do not rub any speck or particle that is in the eye. Lift the upper lid over the lower lid, allowing the lashes to brush the speck off the inside of the upper lid. Blink a few times and let the eye move the particle out. If the speck remains, keep the eye closed and seek medical help.
- Try flushing the object out by rinsing the eye gently with warm water. You may have to help hold the eye open



Eyelid turned inside out: **A.** If tears or gentle flushing do not remove object, gently pull lower lid down. Remove an object by gently flushing with lukewarm water or a wet sterile gauze. **B.** If no object is seen inside lower lid, check the upper lid. **C.** Tell the person to look down. Pull gently downward on upper eyelashes. Lay a swab or match-stick across the top of the lid. **D.** Fold the lid over the swab or match-stick. Remove an object by gently flushing with lukewarm water or a wet sterile gauze.

and tell the victim to move the eye as it is rinsed. If the object is on the white part of the eye, have the victim look down while rinsing the eye with water.

- If rinsing does not work, the object is probably stuck under the upper or lower lid. Examine the lower lid by pulling it down gently. If you see the object, flush the eye with water. To examine the upper lid, grasp the lashes of the upper lid, place a match stick or swab across the upper lid and roll the lid upward over the stick or swab. If you see the object, remove it with a moistened sterile gauze.

Light burns

These injuries can result from looking at ultraviolet light (e.g., sunlight, arc welding, snowblindness). Severe pain occurs 1 to 6 hours after exposure.

- Cover both eyes with cold, moist compresses and prevent light from reaching the victim's eyes by having him or her rest in a darkened room.
- An analgesic for pain may be needed.
- Call an eye doctor for advice.

Contact lenses

Determine if the victim is wearing contact lenses by asking, by checking on a driver's license, or by looking for them on the eyeball using a light shining on the eye from the side. In cases of chemical eye burns, lenses should be immediately removed. Usually the victim can effectively remove the lenses.

First aid quiz

Head injury

Check (✓) the signs and symptoms of a skull fracture.

1. Pain at the injury site
2. Deformed skull
3. Fluid leaking from ears or nose
4. Discoloration around eye(s) (black eyes)
5. Pupil of one eye larger than pupil of the other eye

ANSWERS: All are symptoms of a skull fracture.

Mark each sign yes (Y) or no (N).

After a head injury, which signs indicate a need for medical attention?

1. Headache lasting more than a day or increased severity
2. Vomiting beginning hours after the initial injury
3. One pupil appearing larger than the other
4. Convulsions or seizures
5. "Seeing double"

ANSWERS: 1. Y; 2. Y; 3. Y; 4. Y; 5. Y

Eye injuries

Mark each action yes (Y) or no (N).

Which represents proper first aid for an object embedded in the eye?

1. Using a damp, sterile, or clean cloth to remove an object lying on an eyeball's surface
2. Using a toothpick, match stick, etc., to remove a foreign object
3. For a large embedded object: using a paper cup or similar item over the eye, but not touching the object, to act as a shield when covering
4. Allowing the victim to see by leaving the uninjured eye uncovered

ANSWERS: 1. Y; 2. N; 3. Y; 4. N

Mark each item true (T) or false (F).

1. Hitting the eye may cause a black eye.
2. An eye doctor should see blurred vision victims.
3. For an eyeball knocked out of socket, gently and carefully replace the eyeball in the socket and cover with a dressing.
4. After a blow to the eye, apply a cold compress immediately for about 15 minutes to reduce pain and swelling.

ANSWERS: 1. T; 2. T; 3. F; 4. T

Mark each action yes (Y) or no (N).

If a tree limb scrapes against an eye and cuts the eyeball, first aid, besides seeking medical help for the victim, includes:

1. Applying a dressing tightly over the injured eye
2. Holding the eyelids of the injured eye open
3. Applying direct pressure to the cut eyeball in order to control the bleeding
4. Loosely applying dressings over both eyes
5. Tightly applying a dressing over both eyes

ANSWERS: 1. N; 2. N; 3. N; 4. Y; 5. N

Choose the best answer.

1. Corrosive acid has spilled into a coworker's eyes, resulting in severe pain.

What should you do first?

- A. Cover both eyes with dressings and immediately obtain medical aid.
- B. Hold eyes open and flood them with water for 15 minutes.
- C. Allow tears to flush out the chemicals.
- D. Pour water into eyes for about 5 minutes.

2. Following your initial actions, which one should you do?

- A. Place wet dressings over both eyes.
- B. Leave both eyes uncovered and seek medical attention.
- C. Allow the victim to rest for at least 30 minutes.
- D. Apply dressings over both eyes and seek medical attention.

3. A welder suffers ultraviolet light eyeburns. Which first aid procedure does NOT apply?

- A. Apply cold, wet dressings.
- B. Have the victim rest with eyes closed.
- C. Do not cover the eyes.
- D. Seek medical attention.

ANSWERS: 1. B; 2. D; 3. C

Reprinted from the National Safety Council's publication: First Aid and CPR; Level 2. First Aid Institute, National Safety Council, 444 N. Michigan Ave., Chicago, IL 60611.

ATTENTION

Bulletin Reader

There is a growing national awareness and concern about the extent to which substance abuse affects the workplace. Workplace substance abuse leads to more on-the-job accidents, higher absenteeism, decreased work quality, and, ultimately, destroyed equipment and lives.

No industry is free from losses due to alcohol and drug abuse—and mining is no exception. With the many hazards involved in mining, we in the mining community cannot tolerate this threat which endangers the lives of users and nonusers alike. We believe that every employer and employee has a crucial role to play in making the workplace safer and more productive.

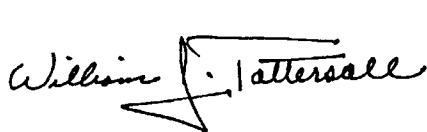
The U.S. Department of Labor has produced the booklet "An Employer's Guide to Dealing With Substance Abuse." This booklet discusses many ways in which employers can address workplace substance abuse.

The Mine Safety and Health Administration (MSHA) has been in-


involved in building awareness of the problem of alcohol and drug abuse in mining, along with the Mining Industry Committee on Substance Abuse (MICSA). MSHA, with assistance from MICSA, has produced a new safety manual, "Coping with Substance Abuse in Mining," which is specifically designed to assist mine operators in eliminating the use of alcohol and drugs at mine sites. Currently, MSHA is distributing both the booklet and the safety manual to active mining operations.

We urge everyone to take a few minutes to read these booklets. They include a resource list in case you have any questions or want to start a program. The safety manual also includes a detailed list of other substance abuse related material. Additional booklets and related products are available through the National Mine Health and Safety Academy (see form).

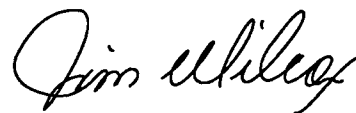
Establishing and maintaining a drug-free workplace takes work, but the rewards are well worth it.



William J. Tattersall
Assistant Secretary for
Mine Safety and Health



Frank Fantauzzo
Co-Chairperson for MICSA



Jim Wilcox
Co-Chairperson for MICSA

ORDER FORM

Be sure to indicate the number of copies for each item you want.

• SUBSTANCE ABUSE VIDEOTAPES

"What Am I Worth?" No. VC-884 (38 min.) (No. of copies)

1/2" VHS @ \$12.00 each

1/2" Beta @ \$12.00 each

3/4" U-matic @ \$20.00 each

"Substance Abuse: Is It Our Problem?"

No. VC-901 (33 min.)

1/2" VHS @ \$12.00 each

1/2" Beta @ \$12.00 each

3/4" U-matic @ \$20.00 each

• SURVEY REPORT

"A Survey of Substance Abuse Programs in the Mining Industry" No. OT-30 @ \$3.00 each

• RESOURCE MANUAL

"Mining Industry Resource Manual for Alcohol and Drug Abuse" No. OT-8 @ \$3.00 each

• POSTERS

"Drinking, Drugs, and Mining Don't Mix"FREE

"Eliminate Alcohol and Drug Abuse in Mining"FREE

• BOOKLET

"An Employer's Guide to Dealing With Substance Abuse"FREE

• SAFETY MANUAL

"Coping with Substance Abuse in Mining" No. SM 25, 1 copy free;
additional copies @ \$1.00 each

Name _____ Title _____

Company or Organization _____

Address _____ Purchase Order No. _____

City _____ State _____ Zip Code _____

RETURN TO:

**National Mine Health and Safety Academy
Attention: Business Office
P.O. Box 1166
Beckley, WV 25802-1166**

Tobacco may provide gateway to drug, alcohol abuse

By Andrew Keegan, NIDA Notes Staff Writer

Nearly 400,000 people in the United States die each year because they used tobacco. This represents three times the number of those who succumb due to alcohol abuse and approximately 20 times the number who die from all other forms of drug abuse, according to a Department of Health and Human Services report.

But even these horrifying statistics do not fully detail the damage tobacco wreaks on American society. Scientists are accumulating evidence that tobacco and its key active ingredient, nicotine, may also provide a gateway to illicit drug use and alcohol abuse.

"Tobacco jumpstarts the whole process that leads to alcohol abuse and illicit drug use," says Dr. Jack E. Henningfield, chief of the Clinical Pharmacology Branch of the National Institute on Drug Abuse's (NIDA's) Addiction Research Center in Baltimore. "Nicotine use is strongly associated with the use of other addicting drugs."

Dr. Henningfield emphasizes the word *associated*. "I'm not saying that the use of tobacco products is a specific cause of drug and alcohol abuse—it's neither necessary nor sufficient for the development of other addictions," he says. "But when we consider all other risk factors, tobacco is clearly one of the most powerful, preventable risk factors preceding drug and alcohol abuse."

Can the consumption of tobacco

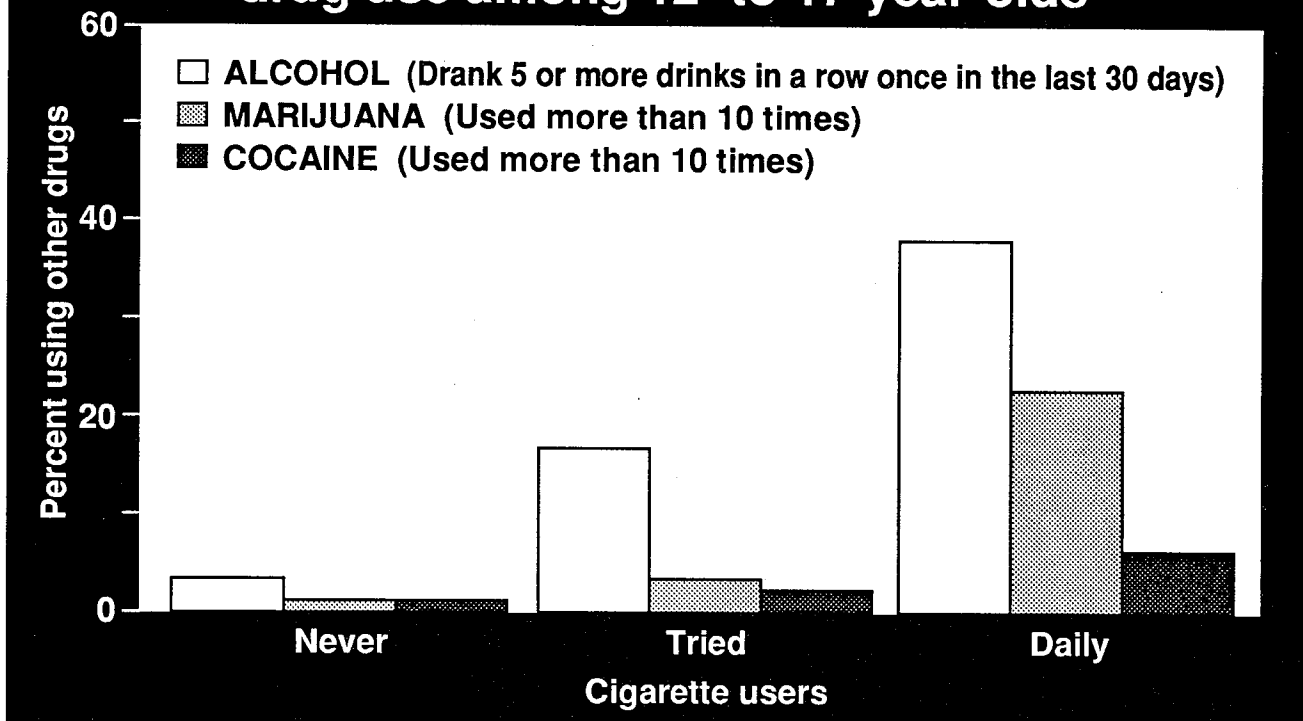
open the door to drug and alcohol abuse? Is tobacco really any different from other commonly available substances, such as milk, bread, or eggs, which also are consumed by people preceding drug and alcohol abuse? Dr. Henningfield answers yes to both questions, offering three characteristics of tobacco that may be involved in the subsequent abuse of drugs or alcohol.

First, nicotine is a potent, addicting drug. It produces changes in the central nervous system by increasing the number of nicotine receptors in the brain. "We don't know that structural changes in the nervous system are a causal factor in the abuse of other drugs," Dr. Henningfield says. "But we do know that nicotine receptors activate the brain's dopamine reward system, just as cocaine and morphine receptors do."

Second, cigarette smoking is a complex learned behavior. People who smoke are literally teaching themselves how to introduce a psychoactive substance into their systems through inhalation. This is significant, according to Dr. Henningfield, because smoking is a potent delivery system for many other addictive drugs, including cocaine and morphine derivatives. "We know of relatively few people who smoke marijuana who do not also smoke cigarettes," Dr. Henningfield adds.

Third, nicotine is used to regulate

The relationship between smoking and other drug use among 12- to 17-year-olds



mood and behavior; it provides relief from stress and boredom, and is even employed for weight control. "People tend to begin smoking at a very young age [12 to 17 years old], at the very time in life when they are going through their greatest changes," Dr. Henningfield notes. These adolescents are at a vulnerable age because they are going through puberty and are often confused and ill at ease with their changing feelings and bodies and thus open to experimentation, he explains. "Young people who smoke learn how to manipulate their moods and feelings with a psychoactive substance—nicotine," says Dr. Henningfield.

Tobacco then becomes a stepping stone to other drug use, he says. "Levels of nicotine use predict levels of drug abuse in adults and adolescents. The older you get and the more you smoke, the higher the likelihood that you will

have a substance abuse problem." One out of every three heavy smokers is a problem drinker, he explains.

Dr. Henningfield notes that tobacco is not the only factor associated with subsequent drug use. Other vulnerability indicators include stress, socioeconomic standing, exposure frequency, and possibly even genetic predisposition.

But tobacco is the most preventable risk factor of the lot, Dr. Henningfield asserts. He considers it to be a "gateway" substance because it may predispose people physiologically and psychologically to abuse other drugs, and because it predicts levels of drug and alcohol abuse. "This is not a trivial relationship," Dr. Henningfield says.

Until researchers sort out the risks involved, the true role played by tobacco in the abuse of other drugs is open to speculation. As of now, no hard

data exist showing that tobacco consumption directly causes the abuse of other psychoactive drugs. But Dr. Henningfield believes that research on the topic would be extremely fruitful.

"We're walking a balance," Dr. Henningfield says. "We don't want to imply that tobacco makes people illicit drug or alcohol abusers, or that prevention of tobacco use would solve our drug problems. But clearly, tobacco is much more closely related to other addictions than candy bars, potato chips, or mother's milk."

References:

Department of Health and Human Services. Reducing the health consequences of smoking, 25 years of progress. A report to the Surgeon General, DHHS Pub. No. (CDC) 898411, 1989.

Henningfield, J.E.; Clayton, R.; and Pollin, W. Involvement of tobacco in alcoholism and illicit drug use. British Journal of Addiction, 85:297-292, 1990.

Henningfield, J.E.; Cohen, C.; and Slade, J.D. Is nicotine more addictive than cocaine? British Journal of Addiction, in press.

Reprinted from the Summer/Fall 1991 issue of NIDA Notes, a publication of the National Institute on Drug Abuse, U.S. Department of Health and Human Services, Washington, D.C.

15th mine safety and health conference to be held

The North Carolina Department of Labor, Mine and Quarry Division, in cooperation with the Mine Safety and Health Administration, will conduct a one and one-half day conference designed to enhance mine safety and health for North Carolina and the south-east.

This year, the 15th Conference will present several topics that are of concern to the mining industry. Program topics will include a Mine Safety and Health Administration Update, Haul Truck Safety Revisited, Review of Serious Accidents in North Carolina, Dusty Trades and Dust Sampling, Hearing Conservation Training, Hazard Communication Standards, and Crisis Communications. A special feature will be a field trip to Texasgulf in Aurora and dinner.

The conference will be March 26-27, 1992, at the Hilton Inn, Greenville, North Carolina. Room reservations can be made directly with the hotel by calling (919) 355-5000. Single rooms are \$50.00 and double rooms are \$60.00, with a 9 percent room tax.

The conference registration fee is \$55.00 per participant which will include breakfast, lunch, break refreshments, light hospitality, field trip transportation, and training materials.

Please accept this as a personal invitation to attend the conference. I urge you to send as many of your mining and safety personnel as possible.

John C. Brooks, Commissioner of Labor, State of North Carolina, 4 West Edenton Street, Raleigh, NC 27601-6197, Telephone: (919) 733-7428.

National Council Meeting

**Joseph A. Holmes Safety Association
and the
Holmes Safety Association**

May 26-28, 1992

**Split Rock Resort and Conference Center
Lake Harmony, Pennsylvania**

The Joseph A. Holmes Safety Association and the Holmes Safety Association will hold their annual business meeting at the Split Rock Resort and Conference Center at Lake Harmony, Pennsylvania, on May 26-28. This year's agenda features many timely safety topics which we feel will be of interest to participants. Mark your calendars and make your reservations today.

LODGING AT SPLIT ROCK

\$70.00 PER PERSON, PER NIGHT

Spouse and children 15 and older:

\$40 per person, per night

Children 14 and under:

\$30 per person, per night

(Rates include 3 meals daily, sales tax, and service charge.)

You must reserve lodging directly with Split Rock Resort and Conference Center. Call 1-800-255-7625 or (717) 722-9111. The conference center requires a \$50 reservation deposit payable by check or credit card (Master Card, Visa, American Express, Diners' Club). We have reserved a block of rooms so be sure to mention you are attending the Holmes Safety Association Meeting when you call.

There is a \$30 registration fee per person, payable when you fill out the attached registration form.

**REMEMBER: REGISTRATIONS
ARE DUE BY MAY 15, 1992.**

AGENDA

Tuesday, May 26, 1992

9:00 a.m. - 4:30 p.m.Registration

6:00 p.m.Joseph A. Holmes Executive Board Meeting

7:00 p.m.National HSA Executive Committee Meeting

Wednesday, May 27, 1992

- 7:00 a.m. - 8:00 a.m.Late Registration
8:00 a.m. to 9:00 a.m.Welcome Address
Ronald L. Keaton, President, National HSA
Pennsylvania Welcome
T. J. Ward, 1st Vice President, National HSA
9:00 a.m. - 10:15 a.m.Electrical Presentation
Eddie Egan
10:15 a.m. - 10:30 a.m. ..Coffee Break
10:30 a.m. - 11:30 a.m....(Your choice)
Room 1- Mines In Russia
Room 2 - Stress Management
Room 3 - Substance Abuse
11:30 a.m. - 1:00 p.m.Lunch
1:00 p.m. - 1:45 p.m.(Your choice)
Room 1- Train the Trainer
Room 2 - Hazard Communication
Room 3 - Safety Around Stockpiles
2:00 p.m. - 2:45 p.m.(Your choice)
Room 1- Roof Control
Room 2 - Wellness Program
Room 3 - Developing an Effective Safety Program
3:00 p.m. - 3:45 p.m.(Your choice)
Room 1- Seat Belt Safety
Room 2 - Safety Around Abandoned Mines
Room 3 - Training Techniques

Thursday, May 28, 1992

- 8:00 a.m.....(Your choice)
Room 1- Go on Tour of Anthracite Mine
Room 2 - Make-Up Demonstration and Style Show
Room 3 - Safety Around Abandoned Mines
Golf Outing Sponsored by Pennsylvania HSA Council
(Those interested in the golf outing should contact T. J. Ward at (717) 787-1376)
11:30 a.m. - 1:00 p.m.Lunch
2:00 p.m.Joseph A. Holmes General Meeting
3:00 p.m.Holmes Safety Association General Meeting
6:00 p.m.Social Hour
7:00 p.m.Annual Awards Banquet

REGISTRATION FORM

Name: _____ Telephone (include area code): _____

Address: _____

City: _____ State: _____ Zip Code: _____

Registration Fee of \$ _____ is enclosed for _____ persons (at \$30.00 a person).

Number of persons who will be attending the following sessions is indicated (mark one in each group for each person):

<p>(1) ____ Mines in Russia ____ Stress Management ____ Substance Abuse</p>	<p>(2) ____ Train the Trainer ____ Hazard Communication ____ Safety Around Stockpiles</p>	<p>(3) ____ Roof Control ____ Wellness Program ____ Dev. Effective Safety Program</p>	<p>(4) ____ Seat Belt Safety ____ Safety Around Abandoned Mines ____ Training Techniques</p>	<p>(5) ____ Tour of Anthracite Mines ____ Make-up Demonstration & Style Show ____ Safety Around Abandoned Mines ____ Golf Outing (call T.J. Ward)</p>
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SEND REGISTRATION FORM TO:

Holmes Safety Association
Room 537
4015 Wilson Boulevard
Arlington VA 22203-1984

REGISTRATION DUE BY MAY 15, 1992.

10th South Central District Joint Mine Health & Safety Conference

March 30-April 2, 1992, at San Antonio, Texas

The planning committee invites you to participate in the promotion of safety and health, and in creating an environment of greater cooperation among industry, labor and government. Operators, supervisors, inspectors, miners, representatives, and safety and health professionals alike will all benefit from this conference.

The conference will be held at the Wyndham Hotel, 9821 Colonnade Boulevard, San Antonio, Texas. Phone (512) 691-8888. A block of rooms has been reserved at a special rate of \$54, single or double occupancy. To assure this rate, reservations must be made by February 29, 1992. The size of the hotel limits attendance to 250 persons. There is a \$60 registration fee which includes the cost of the Wednesday luncheon. Call Dan Haupt at (214) 767-8401 for additional information.

AGENDA

Monday

2:00-4:00 p.m. Registration

Tuesday

7:30 a.m. Registration

8:30 a.m. Opening session

10:00 a.m. Workshops:

Training Tech; Accident Reduction; Stress in the Workplace; Texas Worker's Compensation Law

1:00 p.m. Discussion Groups:

Sand & Gravel; Crushed Stone; Mills; Open Pit; Underground; Contractors

Wednesday

8:00 a.m. Workshops:

Back Safety; Assessments; Asbestos Abatement; JSA & Beyond

9:30 a.m. Workshops:

Environmental Cabs; 30 CFR Part 50 Reporting; Material Safety Data Sheets; Contractor Training Requirements

11:30 a.m. Luncheon:

Keynote Speaker—Edward C. Hugler, Deputy Assistant Secretary, MSHA; Sentinels of Safety & Holmes Awards

1:00 p.m. Workshops:

Training Techniques; Hearing Conservation; New Explosives Standards; How Job & Area Audits Prevent Accidents

3:00 p.m. Discussion Group

Summation

Thursday

8:00 a.m. Extension Programs:

Highwall & Stockpile; Electrical Safety; Substance Abuse & EAP

Detach and mail registration to: *Joint Mine Conference, University of Texas at Austin, P.O. Box 7518, Austin, Texas 78713-7518*

Name _____ Title _____

Organization _____ Address _____

City _____ State _____ Zip _____ Phone _____

Circle a Discussion Group: OP CS ML S&G UG Coal Contractor

The last word...

"Imagination is the highest kite one can fly." *Lauren Bacall*

"Imagination was given to man to compensate him for what he is not, and a sense of humor was provided to console him for what he is." *Robert Walpole*

"Imagination is more important than knowledge." *Albert Einstein*

"Imagination grows by exercise, and contrary to common belief, is more powerful in the mature than in the young." *W. Somerset Maugham*

"Artists treat facts as stimuli for imagination, whereas scientists use imagination to coordinate facts." *Arthur Koestler*

"The soul without imagination is what an observatory would be without a telescope." *H.W. Beecher*

"The power of imagination makes us infinite." *John Muir*

A certain doctor plays a game with some of his young patients to test their knowledge of body parts. One day, while pointing to a boy's ear, the doctor asked, "Is this your nose?"

Immediately the child turned to his mother and said, "I think we'd better find a new doctor!"

A woman on vacation in Las Vegas asked her escort at the roulette wheel what number she should bet on. He told her, "Bet your age."

She placed her bet on No. 25 and fainted when 38 won.

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

REMINDER: The District Council Safety Competition for 1992 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
4015 Wilson Boulevard, Room 537
Arlington, Virginia 22203-1984

Phone: (703) 235-1400

