

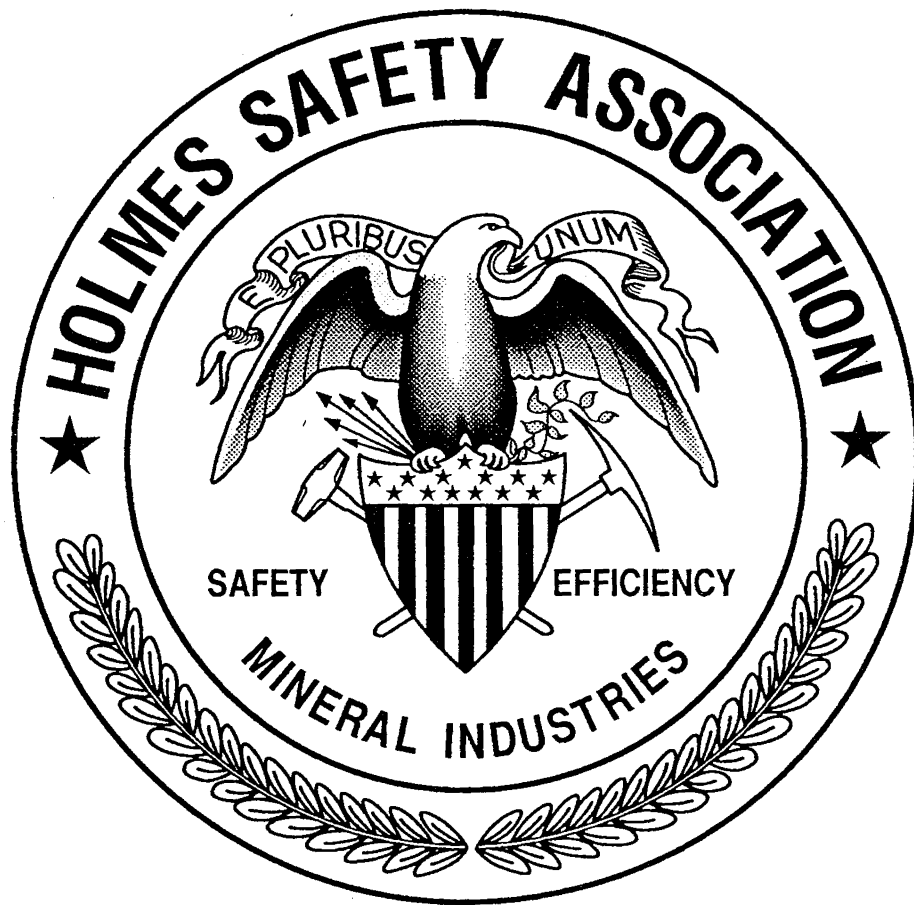
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# BULLETIN

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**October 1991**





October 1991

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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.

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## KEEP US IN CIRCULATION

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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.

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# Welcome new members

NAME	CHAPTER NUMBER	LOCATION	NAME	CHAPTER NUMBER	LOCATION
Apac-McClinton-Anchor Division	9327	Fayetteville, AR	Bill Dengel Construction	9353	Lewistown, MT
Apac-McClinton-Anchor Division	9328	Fayetteville, AR	Dixie Clay Company	9354	Bath, SC
Apac-McClinton-Anchor Division	9329	Fayetteville, AR	Gregg Sand & Gravel	9355	Ainsworth, NE
Apac-McClinton-Anchor Division	9330	Fayetteville, AR	Backus Sand and Gravel	9356	Pierce, NE
Apac-McClinton-Anchor Division	9331	Fayetteville, AR	Lone Star Industries, Inc.	9357	Sweetwater, TX
Apac-McClinton-Anchor Division	9332	Fayetteville, AR	Brubaker - Mann, Inc.	9358	Barstow, CA
Old Dominion Energy, Inc.	9333	Grundy, VA	Texas Workers Comp. Commission	9359	Austin, TX
Red Dog Coal Corp. No. 6-a	9334	Haysi, VA	Meckley's Limestone	9360	Dalatia, PA
Murray Sheet Metal	9335	Parkersburg, WV	Mon Valley	9361	Barton, MD
Sunny Ridge Mining Co., Inc.	9336	Robinson Creek, KY	Industrial Education Dept.	9362	Austin, TX
Old Stagecoach Pit	9337	Hinsdale, MA	Tri-town Gravel	9363	Ballston Spa, NY
The Industrial Company	9338	Bingham, UT	Peckham Catskill	9364	Catskill, NY
Bond Gold Bullfrog	9339	Beatty, NV	L. Strongman & Son, Inc.	9365	Highland, NY
J and S Retraining	9340	Whitesburg, KY	M&S Consulting, Inc.	9366	Saugerties, NY
Tenneco Minerals	9341	Green River, WY	Town of Wawarsing	9367	Ellenville, NY
Markson Silt Bank	9342	Pottsville, PA	Kelly Sand & Gravel	9368	Ellenville, NY
Shoener & Raub Silt Dam	9343	Pottsville, PA	Trophy Electric, Inc.	9369	Kingston, NY
Bear Valley Stripping	9344	Pottsville, PA	United States Gypsum	9370	Southard, OK
Penag/Good Spring No. 1	9345	Pottsville, PA	Londontown, Inc.	9371	Milan, MI
FNF Construction, Inc.	9346	Tempe, AZ	N & R Bunn Crusher	9372	Lewistown, MT
Pioneer Concrete	9347	Anderson, SC	United Fuels, Inc. No. 3	9373	Grundy, VA
Saratoga County	9348	Ballston Spa, NY	Humming Bird Services, Inc.	9374	Haysi, VA
Jim's Ready Mix	9349	Lewistown, MT	Kiah Creek Mining Co.	9375	Pikeville, KY
Chronister and Associates	9350	Little Rock, AR	J & S Collieries, Inc.	9376	Pikeville, KY
Bryant Trucking	9351	Danville, WV	United Fuels, Inc.	9377	Grundy, VA
Montgomery Crusher	9352	Hilger, MT			

# Beware—the drying out season!

The recent drop in the temperature in Kentucky has called our attention to the fact that winter is imminent. Almost everyone is talking about the weather, but there is nothing we can do to change it. However, every winter we take precautions to guard against the cold. We wear warmer clothing, we check the amount of anti-freeze in our automobile's radiator, and we even change our eating habits during the colder months.

The precautions that are necessary for underground coal miners are much more complex than those for most other industries. History has proven that the period between October and March is the most hazardous of the year in coal mines. During a 15-year period (1957-1982), 443 miners perished in 35 separate disasters. Thirty of these tragedies were recorded between October and March.

Conditions in underground mines have already begun to change, and the changes will intensify as the average outside temperature continues to decline. The potential for explosions and fires increases dramatically during the cold winter months. As cold fronts move through, the barometric pressure falls, and methane liberation increases from the coal seam, the strata, and abandoned areas. Adding to this greater potential is the drying out that takes place during the colder conditions. This occurs when the cold, dry air from the surface is drawn into a warmer and wetter atmosphere. The intaking cold

air is warmed, and moisture is picked up and exhausted from within the mine by a fan. The resulting dryer underground environment increases the tendencies for coal dust to serve as a ready-made fuel source for fires and/or the propagation of an explosion.

We can never relax or become complacent about the threat of a fire or explosion in an underground mine. We must guard against that potential every month of every year. Additional awareness, attention and resources are necessary during the critical winter months. All elements of the ventilation system should be scrutinized to ensure maximum efficiency. Additional dust control measures are required. Increased examinations and tests are necessary. Rock dusting and cleanup cycles should be intensified. In short, we must maximize our skills and resources during this crucial period to minimize the potential for disaster.

The annual *drying out* cycle also increases the potential risks of another deadly hazard—roof falls. The strata overlying the coal seam “shrinks” and usually causes deterioration of the roof during this period. During the summer sweating season, increased moisture penetrates the roof, and the “swelling” effect usually results in adverse roof conditions. Additional roof scaling and testing is necessary during both of these periods. Be safe and beware at all times!

*Kentucky Department of Mines and Minerals, monthly bulletin, September 1990*

# JSA Steering Committee report:

The Job Safety Analysis (JSA) Steering Committee, comprised of representatives of mining industry management and labor, state and federal governments and manufacturers, has issued a position statement on JSA.

## **JSA Steering Committee position statement**

JSA is a voluntary tool that has been used by segments of the mining industry to improve workplace safety and health. The JSA Steering Committee, a joint effort of labor, industry, associations, and government, is committed to the cooperative promotion and implementation of the JSA concept throughout the mining community.

The committee recognizes the close tie between an efficient, economically viable operation and a safe operation,

and the need for all segments of the industry to work together to improve the safety and health of the Nation's miners. As a voluntary effort, JSA depends upon the commitment and involvement of top management and the active, constructive participation of the workforce. Through the proper application of JSA principles, employees can be trained in the safest, therefore most efficient, way to perform their jobs.

The JSA Steering Committee will work toward the goal of attaining the implementation of JSA principles in each and every one of the Nation's mines. The JSA Steering Committee is committed to improving mine safety and productivity through the promotion of "A Better Way of Doing Business" - Job Safety Analysis.

The following members of the Steering Committee have given their full endorsement to the JSA position statement:

- Department of Mines and Minerals, Commonwealth of Kentucky
- National Stone Association
- Department of Environmental Resources, Commonwealth of Pennsylvania
- U. S. Steel Mining Company, Inc.
- Department of Mines, Minerals and Energy, Commonwealth of Virginia
- Peabody Holding Company
- Portland Cement Association
- Mine Safety and Health Administration
- Magma Copper Company
- International Union of Operating Engineers
- National Independent Coal Operators' Association
- American Mining Congress
- National Coal Association
- Department of Mines and Minerals, State of West Virginia
- AKZO Salt, Incorporated
- U.S. Steel Workers of America
- Bituminous Coal Operators Association
- U.S. Bureau of Mines

# Small mines training initiative

Under the direction of William J. Tattersall, Assistant Secretary for Mine Safety and Health with the U.S. Department of Labor, the Mine Safety and Health Administration (MSHA) is adding new emphasis to educating miners at our nation's small mines. This effort will be a non-enforcement team approach in cooperation with state mining agencies within the four-state area of Kentucky, Pennsylvania, Virginia, and West Virginia. The focus of this "Small Mines Training Initiative" (SMTI) will center on mining operations included in the Joint Mines Assistance Program, a program already in effect in the four-state area, and other small mines within the four states. In selecting mines for the SMTI program, safety and health compliance records, accident history, inspector input and other factors will be considered.

One of the major efforts of the SMTI will be to encourage the use of Job Safety Analysis (JSA). Assistant Secretary Tattersall endorses JSA as "one of the most important safety tools available to mine managers, foremen and training personnel." JSA and other accident prevention programs can assist operators and miners in recognizing and avoiding hazards which can result in serious injury and loss of life. This can be accomplished through the identification of specific job steps, their associated hazards, and the means to avoid these hazards. In JSA, miners and supervisors together examine every aspect of a

job to identify potential hazards and develop step-by-step procedures for completing the task safely. In addition to JSA, the SMTI Program may apply other accident prevention techniques such as Accident Analysis and Problem Identification (Barrier Analysis). The specialists assigned to the SMTI Program will observe work at the mine to determine if other methods can be used to improve upon training or safety programs at the mine.

Guidance for this new program will come from MSHA's Coal Mine Safety and Health (CMSH) and Educational Policy and Development Offices in Arlington, Virginia. The program will be administered through a field manager located at the National Mine Health and Safety Academy in Beckley, West Virginia. There will be one training specialist assigned to the program from each of eight participating CMSH districts. Each specialist's assignments will be directed toward educating and training mining personnel. Choosing local health and safety training experts guarantees the knowledge of local conditions and personnel. The SMTI manager, located at the National Academy, gives the program ready access to a broad spectrum of training and education resources.

Full utilization of the training resources provided by MSHA and the states should provide the optimum opportunity for small mine operators to improve safety and health at their mines. This program will begin this October.

## **ATTENTION: All HSA readers**

As part of updating our mailing list, we will be placing a response card in the **November Bulletin**. We would like you to fill out the card and

return it to the Arlington, Virginia office. By returning this card, you will continue to receive the Holmes Safety Association Bulletin.

# Holmes Safety Association Monthly Safety Topic



## Fatal powered haulage accident

**GENERAL INFORMATION:** A 61-year-old truck driver, with more than 32 years of mining experience, was fatally injured when the truck he was driving overturned while dumping material on top of a stockpile.

Dolomite and limestone were extracted from a quarry adjacent to the plant using a multiple-bench mining method. Broken material was hauled from the quarry by trucks to separate stockpiles for the dolomite and different grades of limestone. Material from the stockpiles was reclaimed by a front-end loader and fed into a crusher and screening plant. The product was then conveyed to the mill for production of cement.

**DESCRIPTION OF ACCIDENT:** On the day of the accident, the victim reported for work at 7:30 a.m., his normal starting time. He was instructed by his supervisor to haul dolomite from the quarry to the stockpile at the plant, which was his usual job.

The accident occurred at the dolomite stockpile at the plant area. Trucks hauled to this stockpile from the quarry, a distance of about 800 meters. Material was reclaimed from the stockpile by a front-end loader and transported to the primary crusher approximately 45.7 meters away. Normal procedure was to dump the first truckload at the base of the stockpile or on top of the stockpile a sufficient distance away

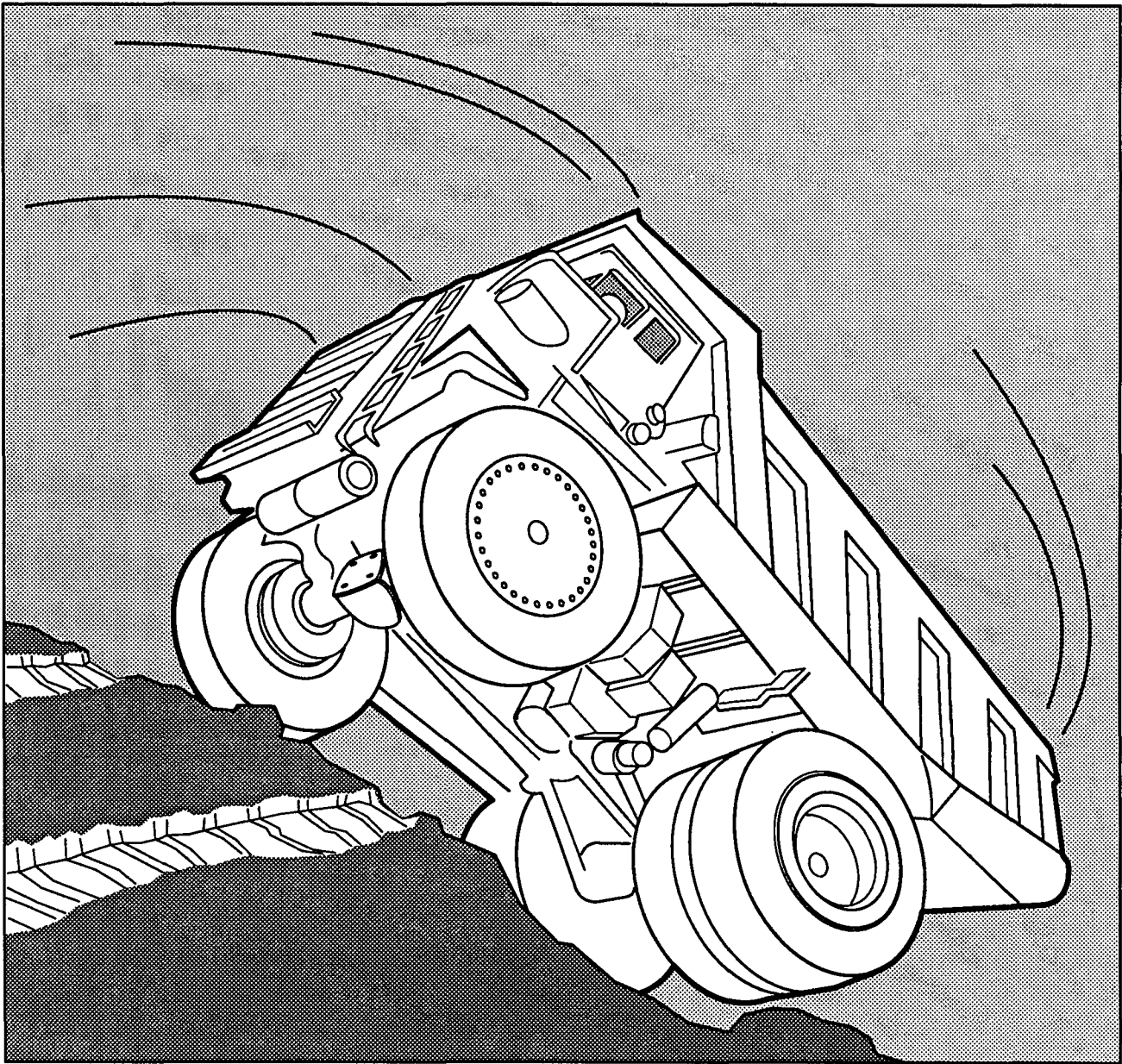
from the edge to allow construction of a berm. Reportedly, all truckdrivers were instructed in this procedure, which was confirmed by the truckdrivers. The berm was then constructed by the front-end loader operator.

The victim hauled a single load from the quarry to the stockpile. A loader operator stated that the truck backed to the berm on top of the stockpile and the dump bed started to raise. The edge of the stockpile began to collapse and the truck flipped upside down and came to rest at the base of the stockpile.

A wash plant operator rushed to the truck and found the victim inside the cab with his back toward the windshield. The aggregate superintendent also arrived and instructed the victim to remain where he was until fire extinguishers were obtained, as fuel was leaking from the truck.

A small fire started and was promptly extinguished. The victim then crawled out of the truck and lay down on the ground.

The aggregate superintendent summoned an ambulance which arrived a short time later along with a rescue truck and a fire department vehicle. The victim's vital signs were reported as satisfactory and the victim was taken to a local hospital. Injuries were listed as a fractured hip and a cracked rib. The victim was to be released from the hospital less than 2 weeks after the



accident, when he died unexpectedly due to a massive blood clot affecting both lungs, as a result of the accident.

**CONCLUSION:** Extraction from the base and undercutting of the stockpile started about an hour before the trucks began to dump material on top. Reportedly, communications between the front-end loader operator and truckdrivers were normally such that the drivers were warned of an undercut condition prior to dumping.

The accident occurred as a result of the stockpile being undercut and the truck dumping too near the edge. Management had observed the undercut area of the stockpile and failed to take action to correct the hazard. The victim, although previously directed to dump at the bottom of the pile or dump back from the edge when the stockpile was undercut, failed to follow this procedure. Failure to wear the seat belt was a major contributing factor to the severity of the accident.



# Mining operations recognized for outstanding safety records

The Mine Safety and Health Administration (MSHA) and the American Mining Congress (AMC) have named six mining operations to receive the coveted Sentinels of Safety trophies in recognition of their outstanding safety records in 1990.

Two sand and gravel operations also were named to receive the award recognizing their outstanding records under a separate program sponsored by MSHA.

"The fine records of these mining operations serve as a reminder that safety and production go hand-in-hand," said William J. Tattersall, assistant secretary of labor for mine safety and health. "The achievements of Sentinels of Safety winners and runners-up reflect a commitment to safety and training that should serve as a model to others in the industry. These types of operations will lead the way to our goal of zero fatalities by year 2000."

Mining companies in various operational categories were honored for completing the greatest number of employee-hours worked during 1990 without an injury that resulted in lost workdays. To qualify, a company had to compile at least 30,000 safe employee-hours without a lost-time injury or fatality in that year.

First-place winners and their number of consecutive employee-hours recorded in each of the sponsored mining categories are:

## Underground Coal Group

*War Eagle Construction Co.*, No. 5 Mine, Mallory, West Virginia, 114,766 hours.

## Surface Coal Group

*Cordero Mining Co.*, Cordero Mine, Gillette, Wyoming, 393,610 hours.

## Underground Metal Group

*The Doe Run Co.*, Fletcher Mine and Mill, Viburnum, Missouri, 110,704 hours.

## Underground Nonmetal Group

*Mississippi Chemical Corp.*, Carlsbad Operations, Carlsbad, New Mexico, 281,373 hours.

## Open Pit Mine Group

*E. I. Du Pont*, Du Pont Florida Mine and Plant, Starke, Florida, 388,267 hours.

## Quarry Group

*Florida Crushed Stone*, Brooksville Gregg Mine, Brooksville, Florida, 323,284 hours.

The sand and gravel mining operations in the categories sponsored by MSHA that received awards for similar achievements are:

## Bank or Pit Group

*Genstar Stone Products Co.*, White Marsh Sand and Gravel Plant, White Marsh, Maryland, 170,404 hours.

## Dredge Group

*U.S. Silica Co.*, Millville Plant, Millville, New Jersey, 96,129 hours.

Other mining operations with exceptional safety records during 1990 included the following:

### Underground Coal Group

*Indian Gap Coal Co.*, Mine No. 1, Wise, Virginia, 110,359 hours;  
*Genwal Coal*, Crandall Canyon Mine, Huntington, Utah, 106,314 hours;  
*Dominion Coal Corp.*, Dominion No. 4, Vansant, Virginia, 90,882 hours;  
*Sycamore Fuels, Inc.*, Mine No. 1, Matewan, West Virginia, 81,528 hours.

### Surface Coal Group

*Mobile Coal Producing, Inc.*, Caballo Rojo Mine, Gillette, Wyoming, 272,177 hours;  
*San Juan Coal Co.*, La Plata Mine, La Plata, New Mexico, 220,739 hours;  
*Mountain Clay, Inc.*, Lyn Log No. 13, London, Kentucky, 194,651 hours;  
*Willowbrook Mining Co.*, Willowbrook Strips, Grove City, Pennsylvania, 189,443 hours.

### Underground Metal Group

*Energy Fuels Nuclear*, Kanab North, Fredonia, Arizona, 85,332 hours;  
*Chevron Resources Co.*, Mt. Taylor Mine, San Mateo, New Mexico, 74,366 hours;  
*Formosa Exploration, Inc.*, Silver Butte Mine, Riddle, Oregon, 55,246 hours;  
*Umetco Minerals Corp.*, Sunday Mine, Nucla, Colorado, 54,540 hours.

### Underground Nonmetal Group

*United States Gypsum Co.*, Oakfield Mine, Oakfield, New York, 157,888 hours;  
*United States Gypsum Co.*, Locust Cove Mine, Saltville, Virginia, 127,723 hours;  
*Georgia Marble Co.*, New York Mine, Tate, Georgia, 69,645 hours;  
*J. M. Huber Corp.*, Quarry, Quincy, Illinois, 48,991 hours.

### Open Pit Group

*U. S. Borax & Chemical*, Boron Operations, Boron, California, 318,887 hours;

*Wharf Resources*, Annie Creek Mine, Deadwood, South Dakota, 240,142 hours;  
*IMC Fertilizer*, Clear Springs Mine & Mill, Bartow, Florida, 225,368 hours;  
*Dravo-Soda Springs*, Enoch Valley Mine, Soda Springs, Florida, 172,639 hours.

### Quarry Group

*Reed Crushed Stone Co.*, Reed Mine and Mill, Gilbertsville, Kentucky, 248,736 hours;  
*Florida Mining & Minerals*, Brooksville Rock Plant, Brooksville, Florida, 149,826 hours;  
*Rock of Ages Corp.*, Rock of Ages Lite Side, Barre, Vermont, 137,713 hours;  
*Material Service Corp.*, Thornton Quarry, Lyons, Illinois, 121,331 hours.

### Bank or Pit Group

*American Aggregates Corp.*, Columbus South 210 Pit and Plant, Columbus, Ohio, 132,902 hours;  
*Becker Minerals, Inc.*, Marlboro Plant, Bennettsville, South Carolina, 119,197 hours;  
*Thelen Sand and Gravel*, Gravel Pit, Antioch, Illinois, 95,328 hours;  
*The Tanner Co.*, United Metal Materials No. 1, Phoenix, Arizona, 94,835 hours.

### Dredge Group

*E. R. Jahna Industries, Inc.*, Ortona Mine and Plant, LaBelle, Florida, 90,526 hours;  
*Pioneer Concrete of Texas, Inc.*, Blue Roan Bend, Garwood, Texas, 87,703 hours;  
*Vulcan Materials Co.*, River Street Sand and Gravel, Chattanooga, Tennessee, 83,991 hours;  
*Whibco, Inc.*, Port Elizabeth Plant, Port Elizabeth, New Jersey, 59,516 hours.

# One more safety meeting!

## Safety meetings should be fun, not boring.

*By Janet Binion*



"Oh no! Not another safety meeting!" How many times has the announcement of your monthly safety meeting met with that response? How many workers whose safety you are responsible for think they know everything there is to know about safe work practices? How many yawns have you had to endure while you were conducting safety training? What can you possibly do to motivate these people to stay awake, to listen, and to follow the safety rules and hazard control ideas you present at your monthly meetings?

### **You are the key**

If you want your trainees to be motivated to attend safety meetings, you must be enthusiastic about the meeting. Victorious battalions were never led onto the battlefield by lackluster lieutenant colonels. Nor do football

teams become champions under careless coaches. Lieutenant colonels and coaches are leaders. And so are you!

To lead your team to a successful safety season, you must believe that your mission is possible. Winning your war against injuries and death due to unsafe practices and conditions is every bit as important as a battlefield victory - and much more important than a football score.

Training is one of the most demanding jobs there is. On the mornings after you've waited up till the wee hours for your teenager to come home with the car or walked the floor with a cranky baby, you cannot hide behind a closed door and a bottle of aspirin. On those days, the prescription is a cup of strong coffee, deep breathing and a determination that the "show must go on."

If you find, however, that you are

unenthusiastic on more training days than not, maybe it's time for a vacation. Or maybe it's time to do something new in your classroom - something that will excite you, as well as keep your trainees' attention. Studies have shown that adults learn in a different manner and for different reasons than do children.

### **Self-directed learners**

Children tend to learn the history or geography lesson that is presented to them for the reward of a grade at the end of the course. Not so for adults. Adults are highly self-directed learners by nature. They do more intentional learning outside, rather than inside, classrooms. And they learn things that interest them, things that they believe will make a difference in their lives. Adults also often resent mandatory training—like monthly safety meetings!

The only way to diffuse the hostility that resistant trainees bring to your class is to acknowledge it—humorously—if that is your style. One trainer begins her classes with the statement, "There is not one person in this room—with the possible exception of me—who really wants to be here. And I'm getting paid to do this!"

After a pause for the inevitable laughter, she continues, "I'm going to do my very best to make this something other than the most boring hour of your month. If each of you will meet me half way, we may all enjoy this time. And we all might just learn something, too!"

One great example of safety-training motivation through humor oc-

curred on an airplane. Most flight attendant demonstrations of safety belts and emergency exits are delivered to the backs of magazines. Not this guy's. He said, "Listen up, everybody. There may be 100 ways to leave your lover. But there are only six ways to get out of this plane. And I'm about to show them to you." Laughter roared through the cabin, and all eyes were on him as he got down to business.

### **Respect your students**

Once you've diffused their resistance, loosened them up and made them laugh, acknowledge your trainees' competence. Your students are not fourth graders with little life experience who are waiting for you to pour your knowledge into their young heads. These are adults—competent people who vote, hold down jobs, raise families, etc.

Acknowledge their competence with statements like, "Many of you are familiar with the safety procedures we are going to cover today. You do your jobs well and have good safety records. So think about this safety meeting as a review. Most of us pick up bad habits when we do something over a long period of time. The material we cover today might just nip a careless habit in the bud and prevent you or a co-worker from being hurt." This kind of acknowledgement is especially important if you've covered the current topic before.

A different approach is necessary when the topic is new or when your company's safety record is not outstanding.

### **Develop a need to know**

When you are presenting a new safety topic, remember that adults need to believe that what they're learning will make a difference in their lives. If, for example, you are conducting hazardous communication training in response to occupational safety and health standards, you must develop a need to know the new material.

An excellent way to engage trainees' interest is through personal experience - yours or someone else's that you know about. An introduction guaranteed to spark a need to know could be, "We're going to talk about the ways to control chemical hazards. I used to work with a guy who'd probably give anything to have had this training..."

Presenting real or simulated case studies for discussion is another good way to make a case that the material will be of value in the life performance of your attendees.

A recent accident on your premises provides you with the perfect opening for a safety meeting, "Sometimes we think we know all there is to know about safety regulations. But if we knew it all, Joe wouldn't be out on disability." An injured friend and coworker is an unfortunate but immediate catalyst for a "need to know."

### **Build on experience**

Everyone learns by relating new knowledge to existing knowledge and prior experience. But adults have a broader and deeper foundation on which to build. Use experiential learning techniques, such as problem-solving exercises, which tap into adults' accumulated knowledge and skills and

engage their analytical abilities.

A group discussion of field experiences, both positive and negative, permits trainees to demonstrate their problem-solving expertise. It also allows you to reinforce their competence. And it gives you the opportunity to interject alternative safety solutions in an atmosphere that does not threaten adults' self-image as mature and competent.

A lecture-oriented meeting is undoubtedly the worst approach to take with adult learners. They experience lectures as being told what to do by an authority figure. People in their 20's, 30's and 40's will be transformed before your eyes into bored, stubborn teenagers.

Safety lectures fail to validate adult learners' maturity, knowledge, experience and competency. Their folded arms, set jaws and glazed eyes will deliver a non-verbal evaluation of this training-method-in-progress.

### **Vary your approach**

If you used a booklet last year when you taught motor vehicle safety, use a different training aid this year. Building this year's motor vehicle meeting around a film or video tape will reinforce the same message with an entirely fresh approach. Varying your approach in this manner not only stimulates your trainees to participate and learn, but it will help you maintain your own enthusiasm for the subject matter.

Audiovisual-based training has the distinct advantage of imprinting positive role models on students. Group discussions, following films and tapes, that are focused on your prepared ques-

tions, reinforce the training points and create an entire safety meeting.

As you design your safety training program this year, be sure to vary your approach from month to month as well as within topics. You'll find an inevitable lethargy setting into your meetings if the trainees can anticipate "one more booklet and discussion." The National Safety Council's Monthly Safety & Health Theme Planner is organized to assist you in acquiring a variety of training aids from month to month and topic to topic.

### **Be prepared**

"Be Prepared" is the motto not just for Boy Scouts and Girl Scouts, but for all successful trainers. If you've been doing the same type of training for awhile, you certainly don't have to spend hours pouring over instructor's manuals or data sheets before each monthly meeting. However, rambling on in a disorganized manner is a formula guaranteed to bore to death the very trainees you're trying to motivate.

Some prep time is necessary before each monthly meeting. Scan your print material. Decide the sequence in which you want to use it. Then make one word notes on an index card. These notes will enable you to keep the group focused and moving in a logical order. And they'll assure that you cover all the important bases.

When you plan to use a film or tape, preview it and jot down questions to generate a group discussion. And remember that preparation extends to any equipment you may use. If you preview your film or tape, you will assure automatically that the projector

or VCR is working. There is nothing guaranteed to fluster the most experienced instructor like fiddling with controls and AV equipment while the sounds of shuffling feet and whispers fill the room.

### **Tips to remember**

You are the key to motivating workers toward learning in safety meetings. Keep your enthusiasm high and understand that the people you are training learn differently than we all did as kids. Acknowledge that they'd probably rather be on a coffee break than in your meeting - loosen them up with humor if you can.

Respect the fact that your trainees are mature, competent adults and need to maintain that self-image throughout your training. Acknowledge their strengths and develop them in a "need to know" when you present new material.

Use training techniques such as problem-solving exercises and group discussions that teach adults by building on their vast reservoir of experience. Vary the type of training aids you use from month to month and within topic areas to reduce the chance of classroom boredom. And avoid "lecturing" at adult students like the plague.

Finally, spend some time organizing yourself before each session, no matter how well you know the safety principles you will be teaching.

Happy training!

*Reprinted from the October 1990 issue of Safety and Health magazine. A publication of the National Safety Council, 444 Michigan Ave., Chicago, IL 60611.*

## **Results of 8th Annual Kentucky Mountain Laurel Mine Rescue, Benchman and EMT Contests held May 31, 1991**

### **Mine rescue contest winners**

**1st Place** - Interstate Coal Co.,  
London, KY *Lewis Mills, Captain*

**2nd Place** - Paramount Mining Co.,  
Wise, VA *Gary Swiney, Captain*

**3rd Place** - Manalapan Mining Co.,  
Evarts, KY *Ronnie Smith, Captain*

### **Benchman contest winners**

**1st Place** - Manalapan Mining Co.,  
Evarts, KY *Edmond Witt*

**2nd Place** - Arch of Kentucky,  
Lynch, KY *Greg Brashears*

**3rd Place** - Interstate Coal Co.,  
London, KY *Steve Adams*

### **EMT contest winners**

**1st Place** - Great Western Coal, Inc.,  
Coalgood, KY

Primary - *Randall McKinney*

Secondary - *James Lundy*

Patient - *Jack Harris*

**2nd Place** - Highland Coal Co.,  
London, KY

Primary - *Wade Haggard*

Secondary - *Winfred Cornett*

Patient - *Mike Eslinger*

**3rd Place** - Cyprus Mountain Coal Co.,  
Bulan, KY

Primary - *David Wilder*

Secondary - *Ray Epperson*

Patient - *Mike Wilson*

## **Results of the 9th Annual Middlesboro Junior Women's Club Mine Rescue, Benchman and EMT Contests held June 14, 1991**

### **Mine rescue contest winners**

**1st Place** - Interstate Coal Co.,  
London, KY *Lewis Mills, Captain*

**2nd Place** - Cumberland River Coal Co.,  
Cumberland, KY *Mike Sparks, Captain*

**3rd Place** - Arch of Kentucky,  
Lynch, KY *Charles Grogan, Captain*

### **Benchman contest winners**

**1st Place** - Arch of Kentucky,  
Lynch, KY *Greg Brashears*

**2nd Place** - Cumberland River Coal Co.,  
Cumberland, KY *Dale Jackson*

**3rd Place** - Interstate Coal Co.,  
London, KY *Steve Adams*

### **EMT contest winner**

**1st Place** - Aceco, Inc.,  
London, KY

Primary - *Judy Couch*

Secondary - *Roger Nease*

Patient - *Vernus Sturgill*

**2nd Place** - Interstate Coal, Inc.,  
No. 2 Team - London, KY

Primary - *Bill Stapleton*

Secondary - *Bill Grigsby*

Patient - *Pearl Farler*

**3rd Place** - Interstate Coal, Inc.,  
No. 1 Team - London, KY

Primary - *Chuck Barton*

Secondary - *Rick Campbell*

Patient - *Kevin Bruner*

# Fire Prevention Week

October 6-12, 1991

**BIG  
FIRES**  
Start small...



**Know where your  
extinguishers are  
and how to use them!**



**...and most small fires can be  
extinguished easily, if you can use  
a portable extinguisher immediately  
and correctly!**

*Courtesy of Mines Accident Prevention Association, Ontario, Canada*



# Hot tips to protect your home from fire

Some sensible precautions and preparations can make a life-or-death difference.

*By Joen Kinnan*

Greta Barr never found out who killed the handyman. The 32-year-old schoolteacher rested comfortably in her bed and glanced sleepily at the clock. It was 1:30 a.m. "Oh well," she sighed. "Only 25 more pages 'til I discover who killed the handyman." Greta yawned, lit a cigarette and resumed reading. At 1:40 a.m., Greta dozed peacefully with the open book half-hidden in the covers beside her. Near her right hand, a hot red killer burrowed deep into the quilt. By 2:15, the bed was aflame, and the room was filled with acrid, lung-searing smoke. In little more than an instant, Greta lost her life. This tragic incident didn't have to happen—it was preventable, just like so many other accidental fires. The number of deaths and injuries from accidental fires is appalling.

## Careless smoking kills

Nationally, cigarettes cause 2,300 house-fire deaths each year. Adults who smoke carelessly or who fall asleep while smoking not only kill themselves, they're also responsible for the largest percentage of home fires that kill or injure children. In a typical situation, an unnoticed cigarette falls into upholstered furniture or bedding where it may smolder for hours. By the time the fire breaks out, the household members are often asleep.

It doesn't take a full-blown fire to kill either. More deaths are due to smoke inhalation—carbon monoxide poisoning and other toxic gases—than to burns. If you must smoke or if you have smokers in your home, follow these safety tips:

- Never leave lit or burning smoking materials unattended.
- Keep matches, lighters and smoking materials out of the reach of small children.
- Make sure cigarettes, cigars and ashes are out before dumping ashtrays into nonflammable trash containers.
- After a party, double-check wastebaskets, ashtrays, furniture and carpets for carelessly discarded smoking materials. Be sure candles are out, too.
- Don't smoke in bed.

## How to prevent burns

Burns are the leading cause of childhood injury-related deaths in the home. They rank just behind auto accidents and drowning as the overall cause of childhood accidental deaths. Many children (and adults) are seriously burned or killed because of contact with open flames.

A crackling fire on the hearth is just the ticket for chilly fall days and blustery winter evenings. But fireplaces can be deadly if they're not properly cared for. Sparks from burning wood can ig-

nite clothing or draperies and may smolder undetected in carpets or furniture. When wood is burned, highly flammable creosote accumulates in the flue, which could lead to a chimney fire if the accumulation isn't cleaned out. Remove ashes only when they're cold. Otherwise, they're a fire hazard to the storage area.

To keep your family safe from burns and open flames, follow these additional precautions:

- Place a screen near the fireplace that covers the entire opening to catch sparks. Never leave a fire unattended.
- Make sure the flue is open when combustion is taking place.
- Burn only seasoned wood, and make sure the fire is out before you go to bed.
- Leave the door on a wood stove closed.
- Keep draperies and furniture at least 3 feet from the fireplace or stove and don't let small children venture too close to the fire.
- Never start a fire with charcoal starter or gasoline.
- Don't burn your Christmas tree in the fireplace. Dry needles and resin can start an inferno that could quickly get out of control.
- Dispose of fireplace ashes only after they're cold. As an added precaution, carry them out in a metal container.
- Have your chimneys, including your main furnace chimney, professionally cleaned annually.
- Don't use cooking grills in the fireplace. Meat drippings or oil can ignite, and send flames leaping out of the fireplace.
- Keep children at least 3 feet away from a gas or wood stove, pilot light,

gasoline or kerosene heater, and fireplace.

### **Snuff out kitchen fires**

Cooking fires are common and usually occur when cooking foods are left unattended. Food starts to burn after moisture is cooked away, and grease fires start when fats or oils overheat or boil over. If a fire starts, try not to panic. Act quickly. Snuffing the fire out when it's small keeps damage to a minimum.

Approach a grease fire wearing an oven mitt, and hold the pan's lid vertically to shield yourself from smoke and flames. After turning off the burner, move the lid forward to the pan, and ease it across the top of the pan and down over the fire. (Do not attempt to bring the lid up over the fire and then straight down.) Once the lid is on and oxygen is cut off, the fire will suffocate.

If a lid isn't nearby (or a fire extinguisher), you can smother a small cooking-oil fire by using a large pan, cookie sheet or cutting board. Baking soda can be effective for a small fire, too. Never use flour on a fire because it can cause an explosion.

Don't fight an oil or grease fire with water. Since oil is lighter than water, it will float on top of the water and continue to burn. Pouring water on a grease fire will also splatter the hot grease, splashing the flaming liquid.

Another common fire-fighting error is to turn on the stove's fan. The fan will only supply more oxygen to the blaze. It can also suck the fire and smoke up through the ventilation system, setting the entire structure on fire. To smother a broiler fire, turn off the heat and close the broiler door.

To further avoid contact with flames, watch what you wear in the kitchen. A pleasant everyday breakfast can become a nightmare with one careless swish of a sleeve over a gas burner. Don't wear robes or other night clothing with long, flowing sleeves when cooking.

### **Practice heating safety**

Heating is the number one cause of residential fires. The best way to keep your central heating system operating safely is to check it annually and have the necessary work done by qualified people. Be sure to change or clean your air filters regularly to avoid over-taxing the furnace.

If you have solid fuel heaters, keep at least a 3-foot clearance between any kind of heater and wall or other object. Solid fuel heaters—wood or coal—can be a fire and carbon monoxide poisoning hazard if not installed and maintained properly.

Portable heaters are great for spot-heating a chilly room, but they can be dangerous. Keep a 3-foot clearance between a floor heater and a wall or any other object. If you choose a portable kerosene heater, be sure it's the proper size for the room you want to heat. You'll need to open a window about 1 inch for ventilation. Don't use these heaters while sleeping.

Use only K-1, water-clear kerosene for heaters. Never store kerosene in a can used for gasoline or other flammable liquids. When you add fuel, take the heater or its tank outdoors. Never move a heater or add fuel when it's still hot.

Electric heaters don't require vent-

ing, but be sure they're equipped with safety devices that shut them off if they're tipped over. Check the heater's stability before you buy it. A wobbly heater is an unsafe heater, even with a safety shut-off.

Be sure your electric portable heater bears the UL (Underwriters Laboratories) or CSA (Canadian Standards Association) mark. Don't use an extension cord unless it's designed for the heavier power load. Also, never use an electric heater in a damp or wet area.

### **Other precautions**

Here are some precautions to take when trying to safeguard your home from fire:

- Your garage, workshop and basement are potential sources of a home fire. Discard accumulated trash, especially if it contains oily or paint-saturated rags. Rubbish can ignite by spontaneous combustion. Never store oily rags, gasoline, or other flammables near open flames or heating sources. Don't use gasoline, paint-brush cleaner or a similar substance without adequate ventilation. Fires—or explosions—can occur when drifting fumes come in contact with a source of ignition.
- Gasoline is not a proper cleaning fluid for clothing or furniture. Don't store gasoline in the house at all.
- Never use pennies or other substitutes for proper fuses. By using fuses of a higher amperage than the ones specified, you're asking for trouble. Fuses are supposed to blow if the circuit is overloaded. If they don't, the wiring may ignite. Fire in the wiring is insidious because it may burn for some time before it's discovered.

- Check your electrical cords and appliances periodically for wear or loose connections. Frayed electrical cords can cause shock as well as fires.
- Keep fire extinguishers in those areas where a fire is most likely. Don't try to put out a fire yourself unless it's very small and manageable. Children should never attempt to extinguish fires themselves.

### **Be prepared**

Prevention is obviously the key to averting home-fire tragedies. However, institute a plan of action should the worst happen. Most fires in the home happen between 10 p.m. and 6 a.m. And most victims die from inhaling smoke and poisonous gases long before flames threaten.

Smoke detectors are vital to family safety. Install one on every floor of your home. Install the detector on the ceiling or high on the wall outside bedroom areas. Check once a month to make sure the batteries are still good. Replace them annually, and don't raid your smoke detector for its batteries to use in a flashlight or toy. A nonfunctioning smoke detector is no protection at all. Remember someone who is hearing impaired won't be able to hear a smoke alarm go off. He or she will need a special receiver that hears the detector and then vibrates a bed or flashes a light.

If a fire does occur, get out of the house. Use the stairs and head down. If your path is blocked by smoke or fire, go to the roof. Hold regular fire drills to prepare for such an emergency so everyone will know what to do. Figure out two escape routes from every room

(if possible) in advance and insist that adults and children learn them. Designate a gathering point outside so you can quickly count noses should a fire occur. Rope or chain ladders, or outside fire escapes should be available to upper-story rooms.

Keep all the bedroom doors closed at night. Doors can hold back smoke and fire and allow you more time to escape.

If your bedroom door is hot when you test it, use your alternate exit. If you're on the first floor, you can climb out the window. On higher floors, if there's a balcony or roof outside your window, wait there. If you exit the room, stay low. Smoke rises, so the best air is near the floor.

If you can't leave the room, call the fire department from there (if possible). While you're waiting for help, seal off the cracks around the door as best you can. Open the window for air—if smoke and fire aren't rising from below—and hang a sheet or cloth out to signal for help.

If your clothing catches fire, don't run. Stop where you are, drop to the floor and roll to put out the flame. You can also wrap yourself in a blanket or rug to put fire out. Teach your children to do the same. Buy children's clothing—especially sleepwear—and household furnishings with flame-retardant labels.

If you live in a high-rise building, teach your children the shortest escape route from your apartment and practice following this route until it's familiar. Practice at night, too. Never use an elevator if there's a fire.

Remember, leave the building im-

mediately if fire does strike. Don't stop to call the fire department, to collect important papers or to find pets. Just because flames haven't reached you yet, doesn't mean that you have time to gather things. Instead, call the fire department from a neighbor's house after you're safely out. Keep in mind that more people are killed by carbon mon-

oxide inhalation than by flames.

Don't become a statistic. Make your home as fire-safe as you possibly can. Then plan and practice what to do if fire strikes.

*Reprinted from Safety & Health, the magazine of the National Safety Council, September 1990.*

## Check smoke detectors

More home fire injuries and deaths are caused by smoke and toxic gases than flames. In just 2 minutes, a serious fire can fill a house with black smoke and soot so thick you can't even see your hand in front of your face. If you wake up to a fire under those circumstances, you may be disoriented and unable to find your way around a room you've lived in for years. Smoke detectors provide an early warning that can wake you and your family and allow you to act swiftly in an emergency.

Time is your biggest enemy in a fire. In just 30 seconds, a small flame from a dropped match can grow into a fire burning out of control. In as little as 5 minutes, your house can be engulfed in flames. Assuming your smoke detector goes off 2 minutes after a fire starts, you've got less than 2 minutes to get out of the house.

So the sooner you know your house is on fire, the better your chances of escaping unharmed. In fact, your chances of dying in a home fire are cut in half if a detector is present, according to the National Fire Protection Association (NFPA), Quincy, Massachusetts.

You need to escape as fast from the

heat in a fire as from the flames. Temperatures in a fire can reach 600 degrees at eye level and 1,000-1,500 degrees Fahrenheit around the ceiling. These temperatures will fuse your clothing to your skin and char wooden beams and furnishings that are never directly touched by flames. Inhaling this super-hot air, even once, can scorch your lungs and cause them to collapse.

Smoke detectors should be placed at the top of open stairways and in hallways near bedrooms, either on the ceiling or 6-12 inches below the ceiling on the wall. At least one smoke detector should be installed on each level of your home.

To be effective, of course, your smoke detector must be operational. The NFPA estimates about 30 percent of home smoke detectors are not working. Battery-operated smoke detectors should be tested weekly and the batteries replaced at least once a year. Regularly vacuum the grillwork on the detector. Replace a non-working smoke alarm if it can't be repaired.

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# Home chemical hazards

Hazardous chemicals are present in virtually every American home—they're in your cleansers, your disinfectants and even in the motor oil in your garage. Hazardous household chemicals may be grouped into four categories:

1) *Reactive Products*—These contain unstable compounds that may react with air, water or other chemicals with dangerous results. An example is calcium hypochlorite—a powder used to disinfect swimming pools. It can react with paint or kerosene to produce explosive and toxic chlorine gas.

2) *Corrosives*—These are strong acids or bases that "eat" away other substances. Examples include chlorine bleach (a powerful acid), and drain opener (a powerful base). Corrosives can cause severe burns on contact and their vapors can burn the eyes. They are also poisonous if ingested.

3) *Flammables*—Ignitable substances, like gasoline and furniture polish, pose a fire hazard if improperly stored or used.

4) *Toxics*—These have perhaps the greatest potential for danger because, in addition to poisoning individual users, they can pollute the environment if disposed of improperly. Some examples are herbicides and insecticides.

Other hazardous household products include anything in an aerosol can. These can explode and disperse their contents in the air you breathe.

Be a smart consumer. Read a product label before you buy, know what potential hazards exist, and act accordingly.

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## Smoke is corrosive

All smoke from burning materials is corrosive, even if it does not contain acid gases, because corrosion is a consequence not only of smoke, but of heat, condensed water vapor and oxygen, which are present in all fires. However, corrosion-inhibiting treatments applied to telecommunications and other electronics equipment soon after a fire, can reduce the effects of corrosion. These findings were among the highlights of a technical paper presented by Marcelo M. Hirschler, a member of the Vinyl Institute, at the International Wire and Cable Symposium.

"The amount and composition of the smoke generated, the ambient humidity and temperature can often have more of an effect on corrosion in a fire than the type of material combusted," said Hirschler.

He further noted that, because a fire's temperature can determine a material's corrosive potential, materials with low burn rate and heat release can actually contain corrosion by keeping the fire cooler and decreasing the rate of its spread.

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# Holmes Safety Association Monthly Safety Topic



## Fatal fall of person accident

**GENERAL INFORMATION:** A 40 year-old hauler operator, with 1 year and months of experience, was working with a utility crew when he fell 160 feet from the highwall to the bottom of the dragline pit.

The mine is a large, open pit, surface coal mine. The coal seam is classified as sub-bituminous and dips 2 percent to the east. The pit measured 110 feet wide, 160 feet deep and extended for over 3,000 feet. The pit was cut in an east-west direction with the east end closed. The seam measures 80 feet thick with an average overburden of 80 feet. The highwalls are not benched.

Overburden is removed by dragline and the truck-shovel method. Coal is loaded by shovel into 120- and 170-ton coal haulers. Shipment of coal is by rail and truck.

The mine employs 168 persons of which 122 are hourly and 46 are management employees. The mine operates 3 shifts per day, 7 days per week, and the daily production is nearly 20,000 tons. The shifts start at 7:00 a.m., 3:00 p.m., and 11:00 p.m. The foreman rotates with each crew. Coal is produced on each shift.

**DESCRIPTION OF ACCIDENT:** The 7:00 a.m. shift began operations under the supervision of the general production superintendent. A five-man crew, under the direction of the crew supervisor, was assigned the task of lowering a water pump into the east end of the No. 2 dragline pit. Work proceeded by placing the necessary

heavy equipment, two scrapers, one front-end loader, one rubber-tired dozer and one road grader, into position along the top of the No. 2 Pit highwall.

An electric generator with fuel tank was placed in a position to provide power for the pump. One end of the 1-1/2 inch diameter electric cable was attached to a metal post planted in the ground to keep it from sliding into the pit with the pump.

The electric-powered pump was being lowered over the end of the pit from the top of the highwall because of the amount of water and the condition of the bottom of the pit. The pump was constructed to float in the water and be held in position by tag lines. The pump was powered by an electric motor supplied by a generator located on top of the highwall. The discharge hose attached to the pump was used to lift the water up the side of the highwall and out of the pit. The pump, weighing about 2,000 pounds, was mounted on a bed plate provided with four metal drums for flotation and wheels for easy movement. Two 3/8-inch wire rope tag lines were attached to one end of the pump bed plate and a 5/8-inch wire rope attached to the opposite side for lowering the pump into position. One tag line was attached to a scraper positioned about 700 feet along the south side of the pit. The second tag line was attached to the front-end loader in the north side of the pit. The 5/8-inch wire rope was attached to the opposite end of the pump bed plate and was used to lower the pump over the edge of the highwall. The rope was attached

through a sheave mounted on the blade of the rubber-tired dozer positioned 45 feet east of the highwall and attached to a scraper used to lower the pump. Hand held radios were used for communicating instructions to the equipment operators while lowering the pump into the pit.

The power supply, an electric generator with fuel tank, was placed in position on the top of the highwall along with a circuit breaker mounted on a stand for control of the pump. A metal post was planted on the edge of the highwall to hold one end of the electrical cable attached to the pump. Tag lines were attached to mobile equipment, positioned on each side of the pit to guide the pump into position.

The crew supervisor left the work area at about 10:00 a.m. to attend a meeting in the office area. He instructed the victim to act in his place. The victim and the crew members had been involved in similar operations four times before this occurrence. Before lowering the pump into the pit, a 12-foot wide section of the berm along the highwall was removed and the electric pump cable placed in rows so it would feed along with the wire rope as the pump was lowered over the edge of the highwall. The victim had been instructed by the general production superintendent to direct the operation from a position near the top of the coal seam along a ramp that had been built into the west side spoil bank.

The scraper operator lowering the pump from the east end of the pit did not have a radio for communication, so the victim decided to direct him by hand signals. To do this, he remained on top of the highwall near where the pump was being lowered into the pit. The victim was standing about 3 feet from the edge of the highwall and 3 feet south of the wire rope

passing over the edge of the highwall.

As the pump was lowered down the face of the highwall, the electric cable attached to the pump moved along with the wire rope. The pump had been lowered to about 20 feet above the water level when the weight of the electric cable pulled the remaining cable, laid out in rows, over the edge of the highwall. The victim was standing between the cable and the highwall, and when the cable was pulled over the highwall, it struck his legs, knocking him to the ground. When he fell, he slid over the edge of the highwall to the bottom of the pit, a distance of about 160 feet. Injuries received in the fall resulted in his death. The accident occurred at 12:10 p.m.

A temporary road had to be constructed to the bottom of the pit to be able to recover the victim. He was then transported to the mine entrance road to await the arrival of the county coroner. In the meantime, an emergency unit, summoned by telephone, was on the scene. CPR was administered without any positive results. All first aid was discontinued after receiving medical advice.

**CONCLUSION:** Information obtained during the investigation indicated the accident was caused by the victim being positioned in a hazardous location near the top edge of the highwall where he was struck by the electric cable and, then, fell from the highwall. Not wearing a safety belt was a contributing factor.



# First aid



## Taking the sting out of burn accidents

**With proper training and safety programs, workplace burn accidents can be reduced.**

*By Sherree Gezer*

A mechanic, jump starting a fleet vehicle, accidentally explodes the battery, splashing himself with sulfuric acid. He is rushed to a local hospital suffering from a painful chemical burn.

Meanwhile, across the country, a contractor accidentally backs into a hot pipe while surveying a petroleum site. He is admitted to the facility's infirmary to receive treatment for a small thermal burn.

Elsewhere, a welder using arc welding equipment momentarily looks into its bright light. He injures the cornea of his eye and is sent to the industrial

nurse to have his flash burn treated and patched.

These are just a few examples of typical burn accidents that American workers encounter on the job. They may be as seemingly innocuous as a hallway collision that sends coffee flying, or as dangerous as an oil refinery explosion that leaves plant workers covered with third-degree burns.

No matter what their cause, burns are a fact of life in many industries, costing employees time and suffering and employers financial and worker losses.

What's the answer to minimizing the cost of burn accidents to both employees and employers? Prompt, careful attention to burns at the injury site.

### **Types of burns**

Correct assessment of a burn's severity is one of the first critical steps in properly treating and managing the injury. Burns—suffered on the job or off—are classified both by their depth and amount of body surface area injured. First-, second-, and third-degree identify the layers of skin damaged; while minor, moderate and critical describe both the depth and extent of tissue injured.

First-degree burns are topical burns involving only the outer layers of the epidermis. Characterized by redness, itching and burning, these burns are generally considered minor and don't require the attention of a physician. Mild sunburns are typical first-degree burns.

Second-degree burns damage both the epidermis and dermis (second layer of skin). These burns cause blisters and are prone to infection, often requiring medical attention. Second-degree burns are also subclassified as superficial or deep dermal depending on the extent of injury.

Third-degree burns are severe burns that destroy both the epidermis and dermis. These burns are distinguished by their dry surface and pearly white or charred appearance. Third-degree burn patients often experience no pain following their injury because nerve endings are impaired. These injuries always require the attention of a hospital burn center, where the patient may

need to undergo skin grafting to ensure proper healing.

Along with their categorical identification, burns are also described by their cause. Types, such as thermal, chemical, electrical, radiation and flash, denote both the source of injury and the symptoms associated with it.

Thermal (heat) burns are caused by contact with substances at temperatures above the boiling point of water. Because they are heat related, thermal injuries often occur in conjunction with other burns.

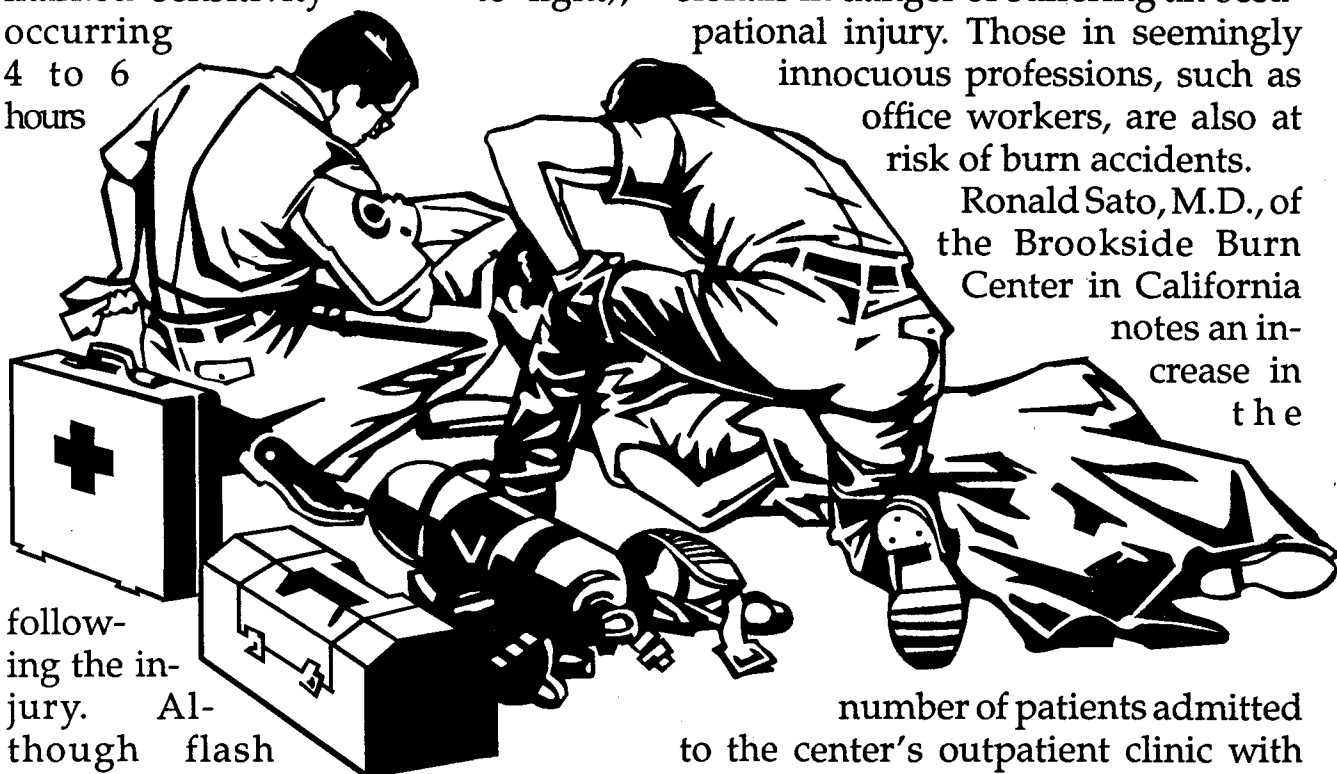
Chemical burns result from contact with caustic agents such as sodium hydroxide, phenol, sulfuric or hydrochloric acid. These corrosive substances generate heat, creating a thermal burn in addition to a chemical burn.

Electrical burns, common among gas and electrical workers, are also considered thermal burns because heat is created while the current passes through the body. These burns are more treacherous than they first appear because the body conducts the electrical current to the heart, muscular and vascular systems, causing extensive internal damage. Because they may be electrocuted themselves, bystanders are strongly cautioned against touching these burn victims until the electrical source has been removed. Immediate medical attention is needed to diagnose and treat these patients' injuries properly.

Sunburns are the most common type of radiation burn. Other sources of ultraviolet or nuclear radiation can also cause burns.

Flash burns are usually minor cornea injuries, the consequence of look-

ing directly into an extremely bright light. Welders and those working with high-powered electrical equipment often experience this syndrome. Flash-burn symptoms include watery eyes, searing pain and photophobia (a marked sensitivity to light), occurring 4 to 6 hours



following the injury. Although flash burns are regarded as more of an annoyance than a serious injury, prolonged exposure to a powerful light source without protective eyewear can result in permanent blindness.

### Frequency of occupational burns

Although most people are likely to suffer only minor burn injuries on the job, no statistics have been compiled on the frequency of work-related burns. Naturally, the more hazardous the occupation, the greater the risk of incurring serious injury.

Andrew Munster, M.D., secretary of the American Burn Association and director of the Baltimore Regional Burn Center in Maryland, believes that

firefighters are most prone to occupational injury. During the course of a 30-year career, a firefighter runs a 12 percent risk of suffering a work-related burn.

Firefighters aren't the only professionals in danger of suffering an occupational injury. Those in seemingly innocuous professions, such as office workers, are also at risk of burn accidents.

Ronald Sato, M.D., of the Brookside Burn Center in California notes an increase in the

number of patients admitted to the center's outpatient clinic with minor and moderate burns.

"In the past year, we've had at least five patients with work-related burns caused by coffee," he says. "Typically, what happens is that someone carrying coffee bumps into someone else and coffee splashes onto one or both people."

In addition, burns are often regionally based with certain types of work-related injuries frequently occurring in company-based communities.

Dr. Munster has witnessed this trend firsthand and says that work-related burns—particularly chemical burns—account for approximately one-fifth of the patients admitted to his facility.

"Baltimore is in the middle of a big

chemical and industrial complex," he explains. "Tanning, steel works and chemical works are located here. We also commonly witness tar burns among workers in the roofing trade and see a number of firefighters suffering from smoke inhalation and burns. High-voltage electrical burns among gas and electric workers are also common."

Munster adds that gasoline burns are common throughout the Midwest where trucking and farming businesses dominate.

The indigenous nature of occupational burns is duly noted by others in the occupational healthcare field. Penny Kenney is president and chief operating officer of the Institute of Health Management, a St. Louis-based consulting firm, which provides on-site care for many coal mining industries. She says her nurses regularly treat flash burns, a malady common among coal miners because of the electrical equipment they use.

In northern California and Texas, the high concentration of oil refineries produces an unusually high number of chemical and thermal burn patients. Semi-conductor and manufacturing companies, which routinely use hydrochloric acid in their manufacturing process, also experience this phenomenon.

And Pat Joseph, health services coordinator at Zenith Corp., Glenview, Illinois, says workers at Zenith's picture tube plant commonly experience chemical and thermal burns. "Hydrochloric acid endangers not only the employees working directly with it, but also the maintenance crew who

cleans up the area and is not used to working with it," she notes.

### **Treatment of burns**

Prompt, competent attention is key to the proper treatment of any burn and to the prevention of further external or internal damage.

An industry's ability to deal with a burn victim is as diverse as the injuries themselves. In-house health care services may be as simple as a conveniently located first aid box or as comprehensive as a multi-service infirmary at an oil refinery.

Once a burn accident occurs, evacuate yourself and others from the area deemed hazardous in order to prevent further injuries. Next, stabilize the burn victim. Extinguish any remaining flames, monitor for vital signs, and check for external bleeding. Finally, remove charred clothing and jewelry. If fabric is stuck to a burn wound, leave it alone, but cut remaining clothing away from the body.

Although different burns require different treatment, the universal antidote for most, especially chemical burns, is water. "With few exceptions, we use water to treat chemical burns—lot's of irrigation," Sato says. "Most of the time, chemical burns are deep second- or third-degree burns because there's just not enough time to remove the chemical. A lot of corrosive or caustic substances penetrate the skin fairly rapidly."

While cold water might seem the most soothing to a painful burn, it isn't the most therapeutic. Cold water can aggravate a burn victim's condition by causing hypothermia or shock. Experts

## Classifying burn severity

### Critical burns:

- All burns complicated by injuries to the respiratory tract, other soft tissues and bones
- Second- or third-degree burns involving the face, hands, feet, groin or major joints
- Third-degree burns involving more than 10 percent of the body surface
- Second-degree burns involving more than 30 percent of the body surface
- First-degree burns involving more than 75 percent of the body surface

### Moderate burns:

- Third-degree burns involving less than 10 percent of the body surface, excluding face, hands, feet, groin or major joints
- Second-degree burns involving 15 to 30 percent of the body surface
- First-degree burns involving 20 to 75 percent of the body surface

### Minor burns:

- Third-degree burns involving less than 2 percent of the body surface, excluding face, hands, feet, groin or major joints
- Second-degree burns involving less than 15 percent of the body surface
- First-degree burns involving less than 20 percent of the body surface

*Source: Grant and Murray, Emergency Care, (Bowie, Md.: Robert J. Brady Co.)*

recommend immersing the burn in tepid water, which cools the injury without causing the victim further harm.

Although the injury may need cooling, the burn victim needs to be kept warm. Sato advises wrapping up a burn patient in order to maintain a normal body temperature.

"It's important to keep the patient warm—not hot, but warm. While it might feel good to apply cold compresses or wet sheets to wounds, it's important to cover the patient in order to keep him or her warm. A burn patient who is shivering is probably too cold," he notes.

Although water is a must, the use of ice to cool a skin temperature is rarely advised. Like cold water, ice may actually hasten the onset of hypothermia, frostbite and shock. If applied at all, ice should be wrapped in several layers of towels to reduce its chilling temperature and soften its sharp edges, which can further damage a burn wound.

Because water is particularly important in treating chemical burns, companies that routinely use or manufacture chemicals are equipped with several strategically placed emergency showers and eye-wash fountains. Emergency showers release copious amounts of water, quickly washing away toxic substances from the body and clothing. Eye-wash fountains release a stream of aerated water to clear the eye of foreign matter.

Munster, who strongly advocates the use of emergency showers, says time is critical in relieving the pain and suffering of a chemical burn victim. "If you have a chemical factory or use chemicals, it's vital to have a shower

## Assessing burn damage

In addition to estimating the severity of a burn, you may need to assess its extent—that is, how much of the patient's body has been injured. The amount of burned skin surface in an adult, generally expressed as a percentage of the total body surface, can be estimated by using the *rule of nines*.

Simply put, the body is divided into segments, with each segment representing 9 percent of the total body surface. Thus, the head and neck represent 9 percent of the body surface, as do the chest, the abdomen, each

arm, the front of each leg, the back of each leg, the upper back, and the lower back and buttocks. The genital area is considered equal to 1 percent.

By adding up the areas affected by a certain degree of burn, you can estimate the extent of injury. For example, an adult patient with third-degree burns on the front of both legs would be classified as having third-degree burns on 18 percent of the body. Keep in mind that it is better to over-estimate the extent of a burn than to underestimate.

facility where an individual exposed to a chemical can get into water literally within 30 seconds," he says. "The depth and severity of injury corresponds inversely to the time it takes the victim to reach water."

Any affected clothing should be cut away, not pulled over the head, before showering. In addition to being rinsed with water, many burns require the application of antibiotic salves, which help facilitate healing and reduce the likelihood of infection. **Don't use water with powdered chemicals**, however. Brush the powder away. Water may activate the chemical (e.g., dry lime).

At Zenith, Joseph says burns resulting from hydrochloric acid are first assessed for redness, blistering, ulceration and the sloughing off of skin. Then, they're flushed with water soaked in neutralizing solution and salved with equal parts of hydrocortizone cream

and vitamins A and D. If the tissue continues to deaden, Zenith's in-house physician may inject calcium gluconate into the wound to facilitate healing.

### Prevention of occupational burns

Many healthcare experts believe that by introducing prevention programs, first aid and safety procedures into the workplace, the incidence of burn accidents could be lowered.

Burn prevention programs are public service efforts run jointly by local fire departments and hospital burn centers, offering safety lectures and demonstrations to the public.

According to Munster, awareness of proper burn prevention procedures among most workers needs to be improved. He also notes a lack of interest among employers in implementing safety procedures. "It's quite difficult to put prevention programs into

the workplace because nobody wants to give you the time," explains Munster.

Munster believes that workers' reactions to crisis burn situations are directly related to their exposure to prevention programs. He says that while children prove the most resourceful rescuers, older workers are often too complacent to handle an emergency situation. "Whenever a child comes in [to the Baltimore Regional Burn Center] who's been involved in a fire accident, and there's an older child present at the scene, they know the stop, drop and roll routine," he notes. "But adults tend to be a little lackadaisical about proper safety procedures, and veteran members of the work force are often quite negligent. After 20 or 30 years on the job, they neglect elementary precautions."

While many industries score low marks in prevention, petroleum refineries are often held as shining examples of safe working environments. Plants are equipped with emergency showers and eye wash fountains, safety proce-

dures are clearly posted, and employees regularly attend first aid programs.

Sherry Polewaczyk, a contracted occupational nurse with Shell Oil in California, gives the company high marks on its safety program, which she believes accounts for the low number of occupational burns among its employees. "Safety is first and foremost around here," she says. "In fact, most accidents happen to people who don't work here, such as contractors who don't know their way around the plant and who aren't familiar with the procedures."

Polewaczyk says she treats more burn patients at a local glass factory: "I see more severe thermal burn patients at the glass company I work for than here. Employees are lower paid, they don't receive the same job training and turnover is faster."

*Reprinted from Safety & Health, the magazine of the National Safety Council, September 1990.*

## How well do you know your fire extinguisher(s)

True or false:

1. Proper conditioning of the fire extinguisher is the responsibility of the owner of the extinguisher?

2. Inspection of the fire extinguishers are required once a month?

3. Inspection is required once a year?

4. Maintenance of fire extinguishers is required once a year?

5. All fire extinguishers equipped with a gauge, require recharging on an annual basis?

6. Records shall be kept on fire extinguishers at all times?

7. Fire extinguishers shall be weighed annually?

8. Plastic-valved fire extinguishers cannot be recharged?

9. Time causes dry powder to cake and lump?

10. Fire extinguishers should be recharged even if they were "popped" and not completely discharged?

*Answers: 1. T; 2. T; 3. F, inspections, monthly, maintenance is annually; 4. T; 5. F; 6. T; 7. T; 8. F; 9. F, moisture cakes dry powder; 10. T. Copyright 1991, Casper Fire Extinguisher Company. All rights reserved. Permission to print granted to MSHA.*

# Safer trick-or-treating

Tomorrow is the big day. Your Teenage Mutant Ninja Turtle outfit is ready, and your sister's all set to be Madonna. Your house is decorated with cobwebs and ghosts. The pumpkin is carved and waiting on the front porch. It's finally Halloween, and that means it's time to hear about safety.

"Oh mom, you and dad always tell us to be careful on Halloween," says Josh. "It ruins it! Halloween is supposed to be scary."

I know it's fun to be a bit scared," his mom says. "I used to scare myself on Halloween by running up to the door of a mean neighbor's house."

Even so, Josh's parents insist that their children practice sensible safety procedures. You should, too. Here's what Josh and his sister Sally do (and don't do) when they're out trick-or-treating

- They carry brightly colored trick-or-

treat bags that are covered with reflective tape.

- They use flashlights so they can see and be seen better at night. (Flashlights

are good for making scary faces, too. Try putting the light under your chin and pointing up.)

- They do not carry sharp objects.

- They trick-or-treat with a group of neighborhood friends.

- They walk around the neighborhood with at least one adult. This year, their father and a couple of other parents are going along. Josh and Sally's dad stays at the curb while they go up and ring doorbells.

- They trick or treat only in familiar neighborhoods, and they stop only at

houses that have Halloween decorations or jack-o-lanterns displayed on them.

- They do not go inside the houses, unless the people are well-known to their parents and their dad signals to them that it's okay to go in.

- They don't walk out into the street





from between parked cars. They cross at corners.

- They watch for cars backing out of driveways.
- They walk from house to house. If they start running, their dad says he's going to take them home. This is the second-hardest part of the safety rules, but they follow it.
- They don't eat any candy until they get home and their parents have inspected it all. This is the hardest part of Halloween. But Josh and Sally eat a snack before they start, so they won't be tempted by the sweets they collect.

By the time they get home, though, they're practically starving. What fun to empty all that candy out on the dining room table and add it up. They throw away any candies that have loose wrappers or broken seals.

Of course, there's lots of candy left over. Josh and Sally's parents help them divide it into "stuff to eat tonight" (not enough to make them sick, but close) and "stuff to save." Over the next few days, they'll ration out candy into their lunchboxes and jacket pockets.

Are you going trick-or-treating this year? It's likely that you are. According to the National Safety Council, 88 percent of American families allow their children to trick-or-treat on Halloween.

There will be a lot of kids out on Halloween night. Please be careful.

### **Tips for parents**

In its booklet "Don't Be Afraid on Halloween!" the National Safety Council lists ideas on how to dress your kids for their favorite national holiday:

- Costumes should be made of a fire-resistant material and be large enough to wear warm clothing underneath.
- Be sure the costume lets a child walk without tripping.
- The child should wear comfortable shoes or sneakers. High heels are not recommended.
- Use light colors or reflective tape so motorists can spot the child easily at night.
- If your child's costume includes makeup or face paint, be sure it is labeled: "made with approved color additives," "laboratory tested," "meets federal standards for cosmetics" and "nontoxic."
- Attach the child's name, address and phone number to a sleeve (if the child is under age 12) in case they get lost. But do not display this personal information openly on the costume.

The Safety Council also suggests that motorists:

- Slow down in residential areas.
- Watch for children darting from between parked cars.
- Watch for children walking along the edge of the road, medians or curbs; in dark clothing, they are hard to see.
- Do not wear a mask while driving to a costume party; avoid wearing a costume that may impede your arms and legs.
- Be sure all children in your car exit on the curb side, away from traffic.

For more information, contact the National Safety Council, 444 N. Michigan Ave., Chicago, IL 60611.

*Catherine O'Neill is a children's writer in Minnesota.*

# Safety footwear steps into dress, athletic and more women's selections

## Employees reject using shoes and boots that are uncomfortable, hinder work, or look unattractive

By Teri Lyn Eisma

At work, especially where occupational hazards abound, shoes must be designed to withstand more than the regular wear and tear.

To comply with safety footwear standards such as the American National Standards Institute (ANSI) Z41, the priority features of a shoe include the following:

- the impact protection offered by a steel toe cap for workplaces where heavy, falling objects could crush an unprotected foot;
- the slip resistance offered by an outsole's tread for slick floors;
- the durability offered by materials designed for exposure to extreme temperatures, chemicals, electricity, water, rough terrain and hard use.

"In a lot of people's minds, [a combat boot] is the perception they have of safety footwear," said Alan Peters, merchandise manager for Lehigh Safety Shoes, Endicott, New York.

"That's no longer a true image. Most major companies have incorporated into their line a style which makes the shoes much more desirable for people to wear, and makes the safety director's job easier."

As with the mainstream market, the safety footwear trend has moved toward a larger, more comfortable selection of women's styles, athletic shoes and dress fashions.

### Women's market

Since more women have entered the work force, manufacturers have developed and expanded their lines of women's safety shoes. The selection includes casual oxfords, sport-type boots, and athletic shoe styles to match the men's line of protective footwear.

There are less heavy-duty shoes available in women's lines, Peters said, but steel-toed shoes, metatarsal guard shoes, electrical hazard shoes, conductive shoes, and hiker boots are all available in women's sizes and styles.

Wedge shoes will be developed to address requests for women's safety dress shoes, Peters said. High-heeled pumps, though, are difficult to design for safe compliance with the ANSI standards, he said, because the toe of high-heeled pumps pinches the foot, and the heel is too small to provide proper slip resistance.

### Athletic style

For workers to accept the shoes that comply with safety footwear requirements, fit and light weight are just as important as protective features. "I used to have a job that involved walking between six and 12 miles a day," said Randy Logsdon, a member of the staff of the National Safety Council and secretary of the ANSI Z41 safety footwear committee. "I used to say, 'I didn't break

in the shoes. The shoes broke me in.”

Because of the mainstream trend toward athletic shoes, safety athletic shoes have become more popular. These incorporate the lightness and shock-absorbance of the athletic shoe with the protection of a steel-toe cap.

### **Dress for success**

Safety dress shoes are for people who work in the less dangerous workplace, Logsdon said, or for people who work in both administrative and industrial environments.

“A lot of the work is becoming less hazardous, in terms of being high-tech,” Logsdon said. “There’s still the danger of something falling or someone stepping on or rolling over your foot or something like that. But it’s less likely, and a comfortable shoe is more important.”

Because of the following concerns of appearance and comfort, workers may develop an aversion to wearing safety shoes:

**The “big toe” look.** “If the shoe is fitted properly, you can’t tell a steel-toe shoe from a non-steel-toe shoe, and the worker won’t be able to feel the steel toe,” Peters said. Some shoes designed to surpass ANSI tests do have a bigger toe, such as the steel toe that surpasses 100 foot-pounds. But the workers love that shoe for its protection, Peters said.

**The “thick foot” look.** A guard is often required to protect the metatarsal bones of the foot from falling objects, and that can make the foot look thick. “There are metatarsal guard shoes with light soles,” Peters said. “We try to get the guards to contour right to the shoe.”

Built-in, vulcanized rubber guards

do just that, with cushioning to protect the foot from the pressure presented by the guard. Logsdon said.

**Heaviness and stiffness.** One development that has facilitated lightness of design is the thinner, light polyurethane outsoles. Although they tend to wear out in extreme heat, they resist chemicals and oils. The lighter outsoles, along with different midsole materials, have made several protective shoe styles lighter and more flexible.

### **Step to the future**

The latest developments have included an electrically dissipating shoe, Logsdon said, “which has become more important in areas around computers and places where a buildup of static electricity or a sudden spark could ignite dust or fumes—as well as mess up somebody’s memory circuits.”

For temperature protection against the steel-toe cap, another development is that of the composite toe cap, made of lightweight, non-conductive material that resists abrasion, corrosion and chemical deterioration, and does not transmit heat or cold.

Because a women’s foot is generally smaller, ANSI suggests a narrower clearance between the top of the foot and the protective toe cap—15/32 of an inch to the men’s standard of 16/32 of an inch clearance as suggested by the ANSI Z41-1983. “I believe that when the ANSI committee resolves this difference, it will be the same clearance for both men and women,” Peters said.

The selection of safety shoes has grown into sizes that fit every foot and hundreds of safety shoe fashions with different combinations of protective

features, Peters said. "The selection of styles, the durability of the product and the manufacturer's ability to fit all the employees with the sizes they need

are important to be a successful safety shoe."

*Reprinted from the October 1990 issue of Occupational Health & Safety magazine, a Penton Publication.*

## President's message

The Mine Rescue, First Aid, and Bench Contest held in Morgantown, West Virginia, on August 15 and 16, was a great success. The contest is sponsored jointly by the Central West Virginia Coal Mining Institute and West Virginia University's College of Mineral and Energy Resources. MSHA and the State of West Virginia's Department of Energy provide the judges and contest officials.

The point I would like to make is that the cooperation of each party involved enabled us to achieve positive results. There were so many individuals from all groups, including the contest participants, who worked really hard and deserve a lot of credit. Lack of space won't permit mentioning each

one by name, but on behalf of those responsible for the contest, I would like to express our sincere appreciation.

The cooperation exhibited by everyone concerned indicates that a very high degree of a cooperative spirit does exist in the coal mining industry. If we could successfully extend that spirit to all other aspects of our working relationship, we could easily reach the goal of zero fatalities by the year 2000.

Just as the hard work and cooperation resulted in a first class contest, so could the same effort and attitude result in first class mining operations that provide safe and healthful work places for our nation's miners.

Winners of the 41st Annual Safety Day contests were as follows:

### Trophy presentations

3rd Place First Aid	-	Jewell Smokeless "B" Team
3rd Place Bench	-	Charles Thomas - Southern Ohio Coal Co., Martinka
3rd Place Combination	-	Jewell Smokeless "B" Team
3rd Place Mine Rescue	-	U.S. Steel, Pinnacle Blue Team
2nd Place First Aid	-	Island Creek - Potomac Division
2nd Place Bench	-	David Shinn - Southern Ohio Coal Co., Meigs 2
2nd Place Combination	-	Island Creek - Potomac Division
2nd Place Mine Rescue	-	Consolidation Coal Co., Buchanan #1
Best Post #5 NMRA		
Team Award	-	Eastern Assoc. Coal Corp., Federal No. 2 Team
1st Place First Aid	-	Eastern Asso. Coal Corp., Walhonde
1st Place Bench	-	Larry Evans - Eastern Assoc. Coal Corp., Pond Fork
1st Place Combination	-	Eastern Asso. Coal Corp., Walhonde
1st Place Mine Rescue	-	The Valley Camp Coal Co., Donaldson Team

# The last word...

"The ballot is stronger than the bullet." *Abraham Lincoln*

"Everything is funny—as long as it is happening to someone else." *Will Rogers*

"Virtue is its own revenge." *E.Y. Harburg*

"We must not confuse dissent with disloyalty." *Edward Murrow*

"Time wounds all heels." *Jane Ace*

"It is easier to stay out than get out." *Mark Twain*

"A man's character—is his fate." *Heraclitus*

"Blessed are the young for they shall inherit the national debt." *Herbert Hoover*

"Fashion is a form of ugliness so intolerable that we have to alter it every six months." *Oscar Wilde*

"The most remarkable thing about my mother is that for 30 years she served the family nothing but leftovers. The original meal has never been found." *Calvin Trillin*

**NOTICE:** We 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 1991 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 Bulletin  
4015 Wilson Boulevard, Room 531  
Arlington, Virginia 22203-1984

Phone: (703) 235-1400

