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PLAN NOW TO ATTEND THE



1967

NATIONAL SAFETY CONGRESS
OCTOBER 23-26, 1967 / CONRAD HILTON HOTEL, CHICAGO

1968

The Congress is always a big week, a worthwhile week for the 13,000 safety people who attend.

1969

At the '67 Congress you can meet other safety people, with the same problems and responsibilities as yourself. You can exchange views and ideas on accident prevention, health, hygiene, and fire prevention . . . on safety in industry, traffic, school, at home and on the farm. You can see the largest of all safety equipment exhibits at the Congress . . . an opportunity for you to make well-informed buying decisions for your company.

1970

This four-day educational program, planned and presented by the National Safety Council, can be your most thought-provoking, most worthwhile safety experience in 1967.

1971

Make plans early to attend the 1967 Congress and bring the other people in your organization who have safety responsibilities.

NATIONAL SAFETY COUNCIL
425 NORTH MICHIGAN AVENUE
CHICAGO, ILLINOIS 60611

FUTURE CONGRESS DATES	
1967	October 23-26
1968	October 28-31
1969	October 27-30
1970	October 26-29
1971	October 25-28

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ANNUAL COUNCIL MEETING

MINUTES OF THE ANNUAL COUNCIL MEETING

The 1966 Annual Council Meeting of the National Safety Council was held in the Grand Ballroom of the Conrad Hilton Hotel, Chicago, on October 24, with Howard Pyle, President, presiding.

Following the singing of the national anthem, the invocation was offered by Reverend William O. Goedert, Assistant Superintendent of Schools, Archdiocese of Chicago.

In opening the meeting, Mr. Pyle read and reported his and the Council's deep appreciation for a letter received from President Lyndon B. Johnson, as follows:

THE WHITE HOUSE Washington

October 15, 1966

Mr. Howard Pyle
President
National Safety Council

One of the most cherished goals of our society is to guarantee all our people the highest possible measure of personal safety and economic security.

Yet accidents — on the highways, in our homes, on the job, in every phase of national life — are taking a terrible human toll every day.

Last year 107,000 Americans died in accidents, 49,000 of them in traffic mishaps. More than 10 million suffered disabling injuries.

These accidents cost our people indescribable personal misery. And they cost our nation many billions in ravaged productive capacity.

Our common challenge is one that you attending the 1966 National Safety Congress and Exposition live with daily. It is to marshal effective new methods of protecting human life and avoiding economic loss through accident prevention.

Each of you has sought out a heavy responsibility. But each of you has the gratitude of all our citizens.

I extend you every best wish for a Congress that will prove rewarding to you and to the public you so faithfully serve.

Lyndon B. Johnson

Mr. Pyle then introduced the Honorable Abraham A. Ribicoff, United States Senator from Connecticut. Mr. Pyle referred to Senator Ribicoff's previous public service as a Municipal Judge in Hartford, Connecticut, a member of the Connecticut Legislature, a member of the United States House of Representatives, Governor of Connecticut, and Secretary of Health, Education and Welfare.

Senator Ribicoff then delivered his address "Traffic Safety and Public Policy," which is included as a part of these transactions, on following pages.

Following Senator Ribicoff's address, Mr. Pyle expressed the National Safety Council's appreciation for his service to the cause of traffic safety, over a period of many years, and presented him with a testimonial plaque, authorized by the National Safety Council's Executive Committee, describing this service.

Mr. Pyle then proceeded with the business of the meeting by announcing a quorum present, in person or by proxy.

It was voted to dispense with the calling of the roll; also to dispense with the reading of the minutes of the previous annual meeting, as the minutes had been printed and circulated to the membership.

Mr. Pyle called for the report of the Nominating Committee, which consisted of the following members: William H. Love, Chairman; Emilie F. du Pont; C. Hunter Green; Donald M. Higgins; W. G. Hatcher; Frank E. Laderer; Miss Marion E. Martin.

Mr. Love reported in behalf of the Nominating Committee, pointing out that the Constitution authorizes the Committee to name candidates for election to the Board of Directors and to all elective offices, and to place in nomination at the Annual Council Meeting such candidates, as well as the

SAFETY EXPOSITION EXHIBITORS — 1966

Kee, Protection Equipment Co., 1201 Kalamazoo St., South Haven, Mich. 49090
Industrial gas masks and accessories.

Kodak and Company, 4915 N. Avers Ave., Chicago, Ill. 60625
Industrial clothing.

Lafayette Glove Mfg. Co., 901 W. Lafayette Ave., Detroit, Mich. 48226
Industrial work gloves and clothing.

Advanced Learning Systems, Inc., 25 E. Salem St., Hackensack, N. J. 07601
Programmed instruction on lifting.

Lena Life Affiliated Companies, 151 Farmington Ave., Hartford, Conn. 06115
Safety films and safety pamphlets.

L. Space Devices, Inc., P. O. Box 338, Paramount, Calif. 90723
A safety device for protection from falling when climbing.

Leona Brass Co., P. O. Box 86, Wooster, Ohio 44691
Fire fighting equipment and accessories.

Lea Wood Steel Co., Conshohocken Road, Conshohocken, Pa. 19428
Abrasive rolled steel floor plate.

M-Types Rope & Sling Products, 4920 W. Madison St., Chicago, Ill. 60644
Lifting devices.

American Allsafe Co., Inc., 1245 Niagara St., Buffalo, N. Y. 14213
Dybbow sweatbands, nylon fan guards and related products.

American Biltrite Rubber, 22 Willow St., Chelsea, Mass. 02150
A complete line of safety soles and heels.

American Chain and Cable Co., Inc., 929 Connecticut Ave., Bridgeport, Conn. 06602
Sling chains and sling chain assemblies, wire rope slings and assemble-your-own wire rope slings.

American Dryer Div., Utah-American Corp., 1124 Franklin St., Huntington, Ind. 46750
Electric hand dryers and emergency lights.

American Industrial Safety Equipment Co., 3500 Lakeside Ave., Cleveland, Ohio, 44114
Welding and cutting goggles, spectacles, welder's lenses, hard hats, visitors' spectacles, and goggle clips.

American LaFrance, 100 E. LaFrance St., Elmira, N. Y. 14902
Fire apparatus and fire fighting equipment.

American Optical Co., 14 Mechanic St., Southbridge, Mass. 01550
Head, eye, respiratory, protective devices; safety clothing; safety specialty products.

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- American Society of Safety Engineers, 5 N. Wabash Ave., Chicago, Ill. 60602
Professional Society.
- Ampco Metal, Inc., 1745 S. 38th St., Milwaukee, Wis. 53201
Hand tools of spark-resistant alloys for use in explosive or flammable conditions.
- Ansul Co., One Stanton St., Marinette, Wis. 54143
Fire protection products.
- Antrex Corp., 4355 N. Avers, Chicago, Ill. 60618
Safety Talker Message Repeater, portable public address systems.
- Apex Safety Products, Washington and Elm Sts., Cleveland, Ohio 44113
Safety hats and caps.
- Atlantic India Rubber Works, 571 W. Polk St., Chicago, Ill. 60607
Hand vacuum lifters.
- Atlas Safety Equipment Co., Inc., 175-179 N. 10th St., Brooklyn, N. Y. 11211
Industrial safety belts, harnesses, and straps. Ladder climber's safety device.
Climatic descent control.
- Atlas Underwear Corp., 803 N. Dowling St., Piqua, Ohio 45356
Underwear.
- Barachar Ind. Instr. Co., 200 N. Bradock Ave., Pittsburgh, Pa. 15208
Gas analyses instruments Humidity and temperature indicators and recorders.
Multi-gas leak detectors. Air flow velocity indicators.
- Badger Fire Extinguishers-Powhatan Brass & Iron Works, Ranson, W. Va. 25414
Fire fighting equipment and supplies.
- W. M. Bashlin Co., 119 W. Pine St., Grove City, Penn. 16127
Linemen's and industrial safety belts, slings, high voltage rubber gloves, etc.
- Bausch & Lomb Inc., 635 St. Paul St., Rochester, N. Y. 14602
Vision and audio testing equipment.
- Bear Manufacturing Company, 2016 5th Avenue, Rock Island, Ill. 61108
Automobile Safety tests.
- Bell Glass & Mirror Co., 1328 Flatbush Ave., Brooklyn, N. Y. 11210
Traffic safety mirrors.
- Bell & Howell Co., 7100 McCormick Rd., Chicago, Ill. 60645
Motion picture cameras, projectors, and film strip projectors.
- Best's Safety Publications, A. M. Best Co., 175 Fulton St., New York, N. Y. 10038
Safety publications.
- Best Mfg. Corp., Menlo, Ga. 30731
Work Gloves.
- 000508
- Canning L. Bete Co., Box 112, Greenfield, Mass. 01301
Scripographic Hooklets.
- Seabrook Steel Co., 701 E. Third St., Bethlehem, Pa. 18016
Wire rope, sling and boom pendant, beam guard rail, and anchor safety nets.
- Edco-Ganewell, 209 W. Central St., Natick, Mass. 01760
Fire fighting and safety equipment, portable spotlights, foam liquids and fire fighting chemicals, fire protection systems.
- L. L. Bouton Co., Inc., 320 Main St., St. Buzzards Bay, Mass. 02532
Industrial eye protection, goggles, and spectacles.
- H. H. Brady Co., 727 W. Glendale Ave., Milwaukee, Wis. 53209
Self-sticking markers and accident prevention signs.
- Beath-O-Life Oxygen, Barclay Bldg., Bala Cynwyd, Pa. 19004
Emergency oxygen administration set.
- Leister L. Brossard Co., 540 N. Michigan Ave., Chicago, Ill. 60611
Safety mirrors for industrial use. Liquid hand cleaner.
- Edward R. Browne Mfg. Co., 839 Stewart Ave., Garden City, N. Y. 11530
Portable explosionproof inspection lights.
- H. H. Bulke Co., Inc., P. O. Box 311, Fort Smith, Ark. 72901
Occupational safety equipment—safety belts, straps, assemblies, harnesses, and allied products.
- E. D. Bullard Co., 2680 Bridgeway, Sausalito, Calif. 94965
Safety hats, caps, and accessories, industrial first aid kits, safety hoist hook, vehicle alarms, air purifiers, and car plugs.
- CAH Industries, 10245 Pacific Ave., Franklin Park, Ill. 60131
Self-extinguishing waste receptacle.
- Cendox Div., Chemetron Corp., 840 N. Michigan Avenue, Chicago, Ill. 60611
Fire fighting equipment and supplies.
- Casco Products Corp., 512 Hancock Ave., Bridgeport, Conn. 06602
Hand-portable pressurized dry chemical fire extinguishers.
- Csall Co., Inc., 1785 Tanen St., Napa, California 94538
Emergency lights and barricades.
- Casco Safety Products, 2727 W. Roscoe St., Chicago, Ill. 60618
Safety glasses and lenses, cup goggles, special purpose goggles, welding helmets, face shields, respirators, plastic aprons, and hoods.
- L. R. Chance Co., 210 N. Allen St., Centralia, Mo. 65240
Hot line maintenance and line construction tools. Hot line tools.
- Charleston Rubber Co., 16 Stark Industrial Park, Charleston, S. C. 29405
Rubber, plastics, and rubber coated gloves, aprons and sleeves.

- Chem-Temp. Corp.**, 200 Route 17, Lodi, N. J. 07644
Instant ice and heat packs.
- Chrysler Corp.**, 341 Massachusetts Ave., Detroit, Mich. 48231
Safety features in 1964 line of automobiles and trucks.
- David Clark Co., Inc.**, 360 Franklin St., Worcester, Mass. 01604
Muff-type ear protection.
- The Coca-Cola Co.**, P. O. Drawer 1734, Atlanta 30301
Coca-Cola served through the courtesy and cooperation of the Coca-Cola Bottling Company of Chicago.
- Columbus McKinnon Chain Div.**, 160 Fremont St., Tonawanda, N. Y. 14152
Sling chains, hooks, and coupling links.
- Conbridge Products Co.**, 82 Carroll Ave., Bridgeport, Conn. 06607
Safety tools.
- Consumer Contact Co.**, 11039 Manchester Rd., St. Louis, Mo. 63122
Safety incentives and awards.
- Converse Rubber Co.**, 392 Pearl St., Malden, Mass. 02148
Safety toe rubber footwear, industrial rubber footwear, protective clothing of rubber and neoprene.
- Crown Products Co.**, 2140 Superior Ave., Cleveland, Ohio 44107
Emergency respirators.
- Custom Materials Inc.**, 279 Billerica Road, Chelmsford, Mass. 01824
Static-free permanently conductive polyolefin.
- Davis Emergency Equipment Co., Inc.**, 55 Halleck St., Newark, N. J. 07104
First aid kits, gas masks and breathing equipment, combustible and toxic gas detectors, and protective hats.
- Demp-Nock Co.**, 21433 Mound Road, Warren, Mich. 48090
Pressure sensitive plastic film lettering kit.
- Den-Va Company**, 62 Stanhope St., Brooklyn, N. Y. 11221
Nylon safety spectacles.
- Detex Corp.**, 53 Park Place, New York, N. Y. 10007
Watchmen's clocks.
- R. E. Dietz Co.**, 225 Wilkinson St., Syracuse, N. Y. 13202
Lanterns, torches, flashers, barricades, and safety equipment.
- Dockson Corp.**, 3839 Wabash Ave., Detroit, Mich. 48208
Spectacles, goggles, face shields, helmets, hats, and respirators.
- Dow Corning Corp.**, P. O. Box 7038, Greensboro, N. C. 27407
Sight Savers, lens cleaning stations.
- Def-Norton Co.**, 100 Pioneer Rd., Box 1719, Charlotte, N. C. 28201
Hand chain hoists.
- E. I. du Pont de Nemours & Co., Inc.**, 1007 Market, Wilmington, Del. 19898
"Nomex" fabric.
- Dymo Products Co.**, Box 1030, Berkeley, Calif. 94701
Labeling device for use in office or shop.
- Eade Mfg. Co.**, 24th and Charles Sts., Wellsburg, W. Va. 26070
Safety cans, cigarette-cigar butt cans, drain cans, drip cans, brass oilers.
- Edgemoor Engineering Co.**, 4511 W. Lake St., Chicago, Ill. 60624
Telescoping work platform.
- Emco-Wilson**, 1205 Walnut St., Coshocton, Ohio 43812
Coated and impregnated work gloves.
- Electronic Specialties Co.**, Island Ave., Batavia, Ill. 60510
Warning lights, barricades, and accessories.
- Elkhart Brass Mfg. Co., Inc.**, 1302 W. Beardsley Ave., Elkhart, Ind. 46514
Nozzles and other fire department supplies and fire fighting equipment.
- Emco Engineering Corp.**, 136 Official Road, Addison, Ill. 60101
Gas vapor alarm systems.
- Falcon Alarm Co., Inc.**, 20 Stern Ave., Springfield, N. J. 07081
Fire alarms, sirens, horns, bells and other signaling devices.
- Federal Sign and Signal Corp.**, 13625 S. Western Ave., Blue Island, Ill. 60406
Sirens, horns, bells, and warning lights for visual and audible signaling.
- Fendall Co.**, 2222 Diversy Pkwy., Chicago, Ill. 60647
Spectacles, face shields, and cup-type and cover goggles.
- Fernal, Inc.**, 400 Main Street, Ashland, Mass. 01721
Fire detector units, explosion suppression systems, smoke detectors.
- Femo-Washington, Inc.**, 6th and Pine Sts., Greenfield, Ohio 45123
Emergency patient handling equipment and accessories for the first aid room.
- Fine-Metal Products Co.**, 5th and Trilghman Sts., Chester, Pa. 19016
Safety hats and caps, face shields, safety masks, welding helmets, headrest and combination goggles.
- Fine Organics, Inc.**, 205 Main St., Lodi, N. J. 07664
Solvents, carbon removers, emission cleaners, polishers, and disinfectants.
- Ford Division—Ford Motor Co.**, Box 658, Dearborn, Mich. 48121
Ford passenger car with safety features.
- Franklin Metal Products**, 213-215 N. Des Plaines, Chicago, Ill. 60606
Waste cans and drum covers.

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- Frommelt Industries, Inc., 465 Huff St., Dubuque, Iowa 52001
Wrap-around portable safety welding shield; portable welding screen.
- Fyrepel Products, Inc., 160 S. Williams St., Newark, Ohio 43055
High heat protective clothing and equipment for industry, space-military, and fighting agencies.
- The Fyr-Flyer Co., 221 Crane St., Dayton, Ohio 45401
Fire extinguisher, automatic sprinkler systems, electronic alarm systems.
- General Fire Extinguisher Corp., 8740 W. Washington Blvd., Culver City, Calif. 90230
Fire extinguishers.
- General Motors Corp., 3094 W. Grand Blvd., Detroit, Mich. 48202
Automotive safety.
- Gilbert & Barker Mfg. Co., 7300 Friendly Rd., Greensboro, N. C. 27410
Drum grounding device.
- Glendale Optical Co., Inc., 130 Crossways Park Drive, Woodbury, N. Y. 11797
Eye and face protective equipment.
- The Globe Div. U. S. Gypsum, 101 S. Wacker Drive, Chicago, Ill. 60606
Safety grating, cable tray, channel and fittings, slotted angles.
- Globe Mfg. Co., Pittsfield, N. H. 03263
Fire protective clothing.
- Globe Safety Products, 125 Sunrise Place, Dayton, Ohio 45407
Resuscitators.
- B. F. Goodrich, Industrial Products Co., 500 S. Main St., Akron, Ohio 44318
Industrial rubber safety footwear, and protective clothing.
- The Granet Corp., 25 Loring Drive, Framingham, Mass. 01701
Coated fabric work glove.
- A. E. Halperin Co., Inc., 75 Northampton St., E., Boston, Mass. 02118
Stretchers, first aid kits, and accessories.
- Haws Drinking Faucet Co., 4th and Page Sts., Berkeley, Calif. 94710
Emergency eyewash and showers.
- Hazard Controls, Inc., 8127 Holman Ave., Delair, N. J. 08110
Warning lights, barricades, signs, reflectors, cylinder chisels, lockouts, ladder shoes, can cutters, flags, and barrier rope.
- Warren Heim Corp., 222 N. 5th Ave., Mt. Vernon, N. Y. 10553
Canvas buckets, bags, and protective covers.
- Karl Heitz, Inc., 979 Third Ave., New York, N. Y. 10022
Eye protection accessories.

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- Hydr Industries, Inc., 1717 Marive Plaza, Milwaukee, Wis. 53202
Traffic cones.
- High Pressure Engineering Co., Inc., 1349 W. Reno, Oklahoma City, Okla. 73109
High pressure pure breathing air compressors.
- High Floor Machine Co., Inc., 1217 W. Washington Blvd., Chicago, Ill. 60607
Explosionproof vacuum cleaners and floor scrubbing and polishing machines.
- High Fastening Systems, 360 Fairfield Ave., Stamford, Conn. 06904
Power-assisted drive tools that fasten pins and threaded studs into concrete masonry and steel.
- Hoffman Electronics Corp., 700 Hoffman Dr., Santa Barbara, Calif. 93105
Highway emergency call box system.
- Hopfield Industrial Mfg. Co., 745 A St., San Rafael, Calif. 94902
Safety ladders, and fiberglass safety diving boards.
- Hy-Tek Safety Shoes, Div., of International Shoe Co., 1509 Washington Ave., St. Louis, Mo. 63166
Safety shoes and conductive and nonconductive footwear.
- Imco Glove Co., 7301 N. Lawndale Ave., Skokie, Ill. 60078
Industrial work gloves and linemen's gloves.
- Industrial Gloves Co., 700 Garfield St., Danville, Ill. 61832
Industrial clothing and accessories.
- Industrial Products Co., 2820 N. 4th St., Philadelphia, Pa. 19133
Industrial clothing.
- Island Chemical Corp., 1120 Bush St., Toledo, Ohio 43608
Industrial chemicals.
- International Film Bureau, Inc., 332 S. Michigan Ave., Chicago, Ill. 60604
Safety films available on a sales and rental basis.
- Interstate Rubber Products Corp., 908 Avila St., Los Angeles, Calif. 90012
Traffic cone system for traffic control.
- Iona Age Shoe Co., 1205 Madison Ave., Pittsburgh, Pa. 15212
Work and dress-style safety shoes and safety rubber footwear.
- Living Air Chute Co., Inc., 1020 S. Broadway, Lexington, Ky. 40501
Airtight mobile seal belts, industrial harnesses.
- Larkin Products, 5523 E. Nine Mile Rd., Warren, Mich. 48091
Goggles, welding helmets, face shields, safety hats and caps.
- Luma Western Mills Co., 2141 S. Jefferson St., Chicago, Ill. 60616
Luminescent material for safety signs.

- Johnson-Williams, Inc., 2300 Lefhorn St., Mountain View, Calif. 94041
Portable instruments for detection of toxic combustible gases.
- Jomac-North, Inc., 863 Easton Rd., Warrington, Pa. 18976
Chemical and protective vinyl clothing and gloves, and terry cloth gloves and products.
- Jones and Co., 861 Broad St., Providence, R. I. 02907
Full-vision visor goggles and replaceable lenses.
- Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh, Pa. 15230
Wire rope and chain slings.
- Juhl Mfg. Co., 4110 Lincoln Blvd., Venice, Calif. 90292
Safety harness.
- Junkin Safety Appliance Co., Inc., 3121 Millers Lane, Louisville, Ky. 40216
Interlocking barrier gate guard for power presses; safety shields for engine stretcher cases and stretchers.
- Justrie Mfg. Co., 2061 N. Southport Ave., Chicago, Ill. 60614
Safety cans, bench cans, plunger cans. Oilly waste cans. Electric lanterns and lights for use in hazardous areas.
- Karel First Aid Supply Co., 4342 Ogden Ave., Chicago, Ill. 60623
Medical equipment for industrial hospitals and first aid rooms.
- Kelmore Inc., 599 Springfield Ave., Newark, N. J. 07103
Explosionproof refrigerators and freezers.
- Kennedy-Ingalls, Inc., 3735 N. 35th St., Milwaukee, Wis. 53216
Protective clothing.
- Keystone View Co., Market and Center St., Meadville, Pa. 16335
Occupational visual service, driver vision test service, and gas sensing and recording instruments.
- Walter Kiddle and Co., Inc., 675 Main St., Belleville, N. J. 07109
Portable fire extinguishers, and accessories. Automatic carbon dioxide fire extinguishing system.
- Kimsafe, Inc., 4900 Campbell Road, Willoughby, Ohio 44094
Personal protection devices for industry.
Personal protection devices for employees in industrial plants.
- Mathias Klein and Sons, Inc., 7200 McCormick Road, Chicago, Ill. 60645
Linemen's and electricians' hand tools, linemen's safety equipment, wire-pulling tools.
- Knapp Brothers Shoe Mfg. Corp., 173 Spark St., Brockton, Mass. 02401
Safety shoes.
- Kenz Glove Co., 2141 W. North Ave., Chicago, Ill. 60647
Leather and rubber work gloves.
- Leady Co., Inc., P. O. Box 88, Branford, Conn. 06405
Fluorescent light tube disposal.
- Water G. Legge Co., Inc., 101 Park Ave., New York, N. Y. 10017
Safety floor maintenance materials. Personnel and equipment grounding devices.
- Leath Safety Shoe Co., First and Minor Sts., Emmaus, Pa. 18049
Leather and rubber safety footwear including conductive and electrical hazard shoes.
- Leary Products, Owens-Illinois, Inc., Box 1035, Toledo, Ohio 43601
Safety incentives.
- Leary Protective Leathers, Box 211, Clark Mills, N. Y. 13321
Leather gloves and mittens.
- Leasville Ladder Co., 1163 Algonquin Pkwy., Louisville, Ky. 40208
Fiberglass and aluminum steps, platforms, extension trestles, aluminum planks and ladders, steel warehouse ladders.
- Le Company, 2501 Hudson Rd., St. Paul 55119
Abrasive flooring material, filler masks.
- Levan McAn Shoe Co., 67 Millbrook St., Worcester, Mass. 01606
Safety shoes.
- Levan A. McDermott Corp., 1639 Stephen St., Ridgewood, Brooklyn, N. Y. 11227
Warning and safety lighting for municipal industrial and utility use.
- Macamery Center, Inc., 1201 S. 6th West, Box 964, Salt Lake City, Utah 84110
Sala Safety Block.
- Meck Products Co., 1324 Hird Ave., Cleveland, Ohio 44107
Welders goggles.
- Meid Glove Mfg. Co., Inc., 2201 W. Wabansia Ave., Chicago, Ill. 60647
Industrial gloves.
- Mc-Lin Safety Devices, 222 W. Ontario, Chicago, Ill. 60618
Seat belt warning device.
- Marathon Rubber Products Co., Box 448, Wausau, Wis. 54985
Industrial and municipal protective clothing.
- Mardon Chemical Div., P. O. Box 68, Washington, W. Va. 25181
Portable highway safety signs.
- Marco Advertising, Box 1220, Medford, Oregon 97501
Safety incentives.

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A. J. Masuen Co., Le Mars, Iowa 51031
Industrial first aid kits and supplies.

Martindale Electric Co., 1375 Hird Ave., Cleveland, Ohio 44107
Protective masks and refills, protective eyeshields, and electrical testing instruments.

Martin Decker Corp., 3431 Cherry Ave., Long Beach, Calif. 90807
Cane scales and indicators.

Medical Supply Co., 1027 W. State St., Rockford, Ill. 61101
First aid kits and accessories. Resuscitation training aids, stretchers.

Meyer Machine Inc., Box 114, Red Wing, Minn. 44066
Safety products for the protection of person while climbing.

Henry L. Michael & Co., Inc., 550 Fifth Ave., New York, N. Y. 10036
Steel bandcutting machine.

Milwest Resilient Floor Co., 7777 W. Lake St., River Forest, Ill. 60305
Floor products.

Milburn Co., 3246 E. Woodbridge, Detroit, Mich. 48207
Protective hand creams and related products.

Miller Allied Corp., 1418 Park Ave., Alameda, Calif. 94501
Material handling slings and adjustable lifting safety beams.

Miller Equipment Co., Inc., 13th and New Sts., Franklin, Pa. 16323
Incident's safety equipment and accessories.

Millers Falls Co., 57 Wells St., Greenfield, Mass. 01301
Shockproof power tools.

Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh, Pa. 15208
Complete line of safety equipment for industry and mining.

Morton Mfg. Co., 5125 W. Lake St., Chicago, Ill. 60644
Safety grating.

Mott Corp., 500 Shawmut Ave., LaGrange, Ill. 60526
Safety mowers.

M-P Corp., 6466 Chene St., Detroit, Mich. 48211
Safety blade for rotary lawn mowers.

National Chemsearch Corp., Box 10087, Dallas, Texas 75207
Safety solvent; cleaners; degreasers; disinfectants; weed killers detergents; insecticides; and water treatments for industry.

National Fire Protection Assn., 60 Batterymarch St., Boston, Mass. 02110
Fire safety.

National Market Corp., 2314 Pawtucket Ave., East Providence, R.I. 02914
Fire extinguisher and alarm products.

National Safety Products Co., 424 New Road, Avon, Conn. 06001
Porcelain on aluminum safety signs.

Nesco Mfg. Co., Inc., 3636 Main St., Kansas City, Mo. 64111
Wire rope fittings, miniature slings, and a miniature crane demonstrating various lifts.

Northern Signal Co., 350 Tower Rd., Saukville, Wis. 53080
Flashers and barricades.

Occupational Hazards, 812 Huron Road, Cleveland, Ohio 44115
Occupational Hazards Magazine.

O and J Resuscitators—Ohio Chemical and Surgical Equipment Co., 1400 E. Washington Ave., Madison, Wis. 53701
Resuscitation and oxygen breathing apparatus.

Ohio Turnpike Commission, 682 Prospect St., Berea, Ohio 44017
Information folders on safe turnpike driving.

Oxy, Inc., 121 Second St., San Francisco, Calif. 94105
Skin-toughener solution for the treatment of athlete's foot.

Organized Labor Safety, 1200 Fifteenth St., N. W., Washington, D. C. 20005
Safety literature.

Osborn Mfg. Co., 960 N. Lake St., Warsaw, Ind. 46580
Safety pliers, lockout devices, millers and stretcher cases.

Oxygen Equipment and Service Co., 8335 S. Halsted St., Chicago, Ill. 60620
Resuscitator, inhalator, and aspirator.

Pac-Kit Safety Equipment Co., 1 Seneca Place, Greenwich, Conn. 06831
First aid kits and supplies.

Packwood Mfg. Co., Div. of Calgon Corp., 1515 Tower Grove Ave., St. Louis, Mo. 63110
Hand cleaners, waterless cleaners, germicidal cleaners, sanitizing compounds, and maintenance cleaners.

Panasonic Chicago, 4615 N. Clifton Ave., Chicago, Ill. 60640
Closet-circuit T.V.

Paula Equipment Co., 105 Industrial Road, Hammond, Ind. 46320
Flashing lights, barricades, traffic cones, vests, flags, trouble lights, signs.

Pacet Scaffolding Co., Inc., 38-21 Twelfth St., Long Island City, N. Y. 11101
Wood and light metal ladders and stages, steel and aluminum scaffolds.

- Pedley-Knowles & Co., 533 Second St., San Francisco, Calif. 94107
Safety and work-holds of manila rope and plastic.
- Penn-All Mfg. Co., 39A Myrtle St., Cranford, N. J. 07016
Fire extinguishers.
- The Pioneer Rubber Co., 1939 Tiffin Road, Willard, Ohio 44890
Industrial gloves.
- Pittman Mfg. Co., P. O. Box 605, Grandview, Mo. 64030
Hydraulic digger, derrick, and aerial devices.
- Porto-Clinic Instruments, Inc., 405 Lexington Ave., New York, N. Y. 10017
Complete portable driver testing and training unit.
- The Positive Safety Mfg. Co., 1052 E. 134th St., Cleveland, Ohio 44110
Power press safety devices.
- Power-Pak Products, 83 Clyde Ave., Buffalo, N. Y. 14215
Fire extinguishers.
- Prairie State Products Co., 3822 W. Lawrence Ave., Chicago, Ill. 60625
Industrial safety signs.
- Proctoscol Co., 1920 S. Western Ave., Chicago, Ill. 60608
Safety containers for the handling, storing and dispensing of flammable liquids.
- Protexall Co., P. O. Box 307, Green Lake, Wis. 54941
Clothing.
- Pulmosan Safety Equipment Corp., 30-48 Linden Pl., Flushing, N. Y. 11354
Respirators, eye protection, helmets, protective clothing, asbestos and leather gloves, safety glasses, first aid kits, and face shields.
- Puritan Compressed Gas Corp., 13th & Oak Sts., Kansas City, Mo. 64106
Oxygen breathing and respiration equipment.
- Pyrotechnics, Div. Baker Industries, 2343 Morris Ave., Union, N. J. 07083
Fire and smoke detection and alarm systems.
- Racine Glove Co., Inc., Box 368, Rio, Wis. 53960
Safety gloves and apparel for industry and fire protection, safety specialty products.
- Radiator Specialty Co., 1400 W. Independence Blvd., Charlotte, N. C. 28201
Traffic guides, cones, lights, flags.
- Rainlair, Inc., 1501 Albert St., Racine, Wis. 53401
Wet weather and safety clothing.
- Ramset Fastening System, 299 Winchester Ave., New Haven, Conn. 06504
Low-velocity piston tool.
- Reed Industrial Co., 3301 Arch St., Philadelphia, Pa. 19104
Industrial safety shoes, work clothing and work gloves.
- Red Wing Shoe Co., 119 Main St., Red Wing, Minn. 55066
Safety workshoes, oxfords, and boots.
- R. C. Reardon and Sons, Inc., 1926 Spearling St., Jacksonville, Fla. 32206
Safety clamps for lifting steel.
- Rexco Plastics, Inc., 16 Industrial Ave., Little Ferry, N. J. 07643
Traffic flags.
- Ryanolds Elevator Corp., 1104 Sixth St., Muskegon, Mich. 49440
Telescoping, electronically operated scaffold.
- San Hardware Mfg. Co., 540 W. Chevy Chase Drive, Glendale, Calif. 91209
Air-conditioned helmet systems.
- San Robbins Co., Brook & Maple Sts., Attleboro, Mass. 02703
Safety incentives.
- Sandford I. C. Webb, Inc., 301 N. Madison St., Rockford, Ill. 61110
Noise resistant ear protectors.
- Sand-Kry Mfg. Co., 7032 N. Tahoma Ave., Chicago, Ill. 60646
Fluorescent light tube breaker.
- Sand Mfg. Co., 2700 W. Barberryl Pl., Denver, Colo. 80204
Automotive seat belts, industrial safety belts, lanyards, net, and ladder safety devices.
- The Becker Co., 747 Bancroft Way, Berkeley, Calif. 94710
Electrical shock safety device.
- Saw-Cut, Inc., Div. Verkau Corp., 973 Market St., San Francisco, Calif. 94103
Steel band cutter.
- Safety Appliance Corp., P. O. Box 689, Tyler, Texas 75701
Protective foot coverings.
- Safety & Industrial Net Co., 23 Edgerton St., East Hampton, Conn. 06424
Safety Nets.
- Safety Box Toe Co., 812 Statler Office Bldg., Boston, Mass. 02116
Steel toes for dress, semi-dress, and work shoes.
- Safety Clothing and Equipment Co., 1990 E. 69th St., Cleveland, Ohio 44103
Safety clothing and equipment for industrial workers.
- Safety First Products Corp., 175 Saw Mill Road, Elmsford, N. Y. 10523
Portable stored pressure dry chemical fire extinguishers.

Safety First Shoes, Inc., 8th and Greenleaf Sts., Allentown, Pa. 18105
Safety shoes for industry, railroad, and military use.

The Safety Journal, Anderson, S. C. 29621
Safety publication.

Safety-Sight, Inc., 1640 Gorsuch Ave., Baltimore, Md. 21218
Radiator water level gauge.

Salecaster Displays Corp., 1010 E. Elizabeth Ave., Linden, N. J. 07036
Illuminated moving message signs.

W. H. Salisbury and Co., 401 N. Morgan St., Chicago, Ill. 60622
Linemen's rubber protective devices.

Sawyer-Tower Products, Inc., 76 Stanley Ave., Watertown, Mass. 02172
Industrial protective, and safety clothing.

Schubert Corp., 1205 Champlain St., Toledo, Ohio 43604
Safety hats and caps, face shields, accessories.

Helmets, safety hats and caps, safety goggles, and wrap-around protective goggles.

Scott Aviation Corp., 225 Erie St., Lancaster, N. Y. 14086
Respirators, inhalators, and environmental protection equipment.

Seiberling Latex Products, 215 Plum St., New Bremen, Ohio 45869
Industrial rubber gloves.

Sellstrom Mfg. Co., Highway 53 at U. S. 14, Palatine, Ill. 60067
Eye and face protective equipment.

The Servus Rubber Co., 1136 Second St., Rock Island, Ill. 61201
Rubber footwear of all types.

Fred Silver & Co., 145 Sussex Ave., Newark, N. J. 07103
Traffic Safety Mirrors.

Singer Safety Products, 450 N. Lake Shore Dr., Chicago, Ill. 60611
Gloves, portable welding screens.

Snyder Mfg. Co., Inc., 1458 Fifth St., New Philadelphia, Ohio 44663
Air suits, hoods, splash and dust suits, shoe covers, safety vests, flags, fabric film laminations, and fiberglass containment closures.

Sonoscope, Inc., P. O. Box 155, Lansing, Mich. 48901
Combination tape recorder and automatic slide projector.

Speakman Co., 301 E. 30th St., Wilmington, Del. 19899
Emergency eyewash and showers.

Sta-Put Enterprises, Inc., 201 Willow St., Massapequa Park, N. Y. 11762
Wheel chocks.

Standard Industrial Products Co. of Ill., 3527 Farrington Rd., Peoria, Ill. 61601
Docking station smoking receptacles.

Standard Safety Equipment Co., 431 N. Quentin Rd., Palatine, Ill. 60067
Acid and chemically-resistant clothing.

Standard Signs Inc., 3190 E. 65th St., Cleveland, Ohio 44127
Industrial accident prevention signs and road work area protection equipment.

Stebenson Corp., Box 1000, Red Bank, N. J. 07701
Radar speed control, breath test for intoxication resuscitation.

Stevens William Co., 216 W. Ontario, Chicago, Ill. 60610
Safety signs and posters.

Stowmore Signs, Inc., 842 Larimer St., Denver, Colo. 80204
Accident prevention signs and tags.

Sub-Fire, Inc., U. S. 1 at Black Horse Lane, New Brunswick, N. J. 08902
Fire extinguishers.

Sueby Rubber Co., North High St., Box 97, Carrollton, Ohio 44615
Safety apparel, gloves, sleeves, aprons, and specialized protective equipment.

Sueby Mfg. Co., 4139 W. Kinzie St., Chicago, Ill. 60624
Press guards.

Suway, Division of U. S. Divers Co., 3323 W. Warner Ave., Santa Ana, Cal. 92702
Self-contained breathing equipment. Wet pick-up vacuum unit. Voice amplifiers.

T. G. Taylor Chain Co., Inc., 3-141st Box 508, Hammond, Ind., 46325
Alloy steel chain and fittings.

Thomas Optical Co., Inc., 1015 Commerce St., Petersburg, Va. 23804
Safety frames, safety lenses and vision tester.

Thomas Continental Electronics Corp., 56 Thomas St., New York, N. Y. 10013
Safety shower — eyebath combination.

The Century Sign Co., 5242 Irving Park Road, Chicago, Ill. 60641
Safety signs.

Tk-Tri, Inc., 6411 N. Mequon Rd., Mequon, Wis. 53092
Safety cones traffic posts.

UG-Lite Mfg. Co., 290 Prairie St., Crystal Lake, Ill. 60014
Battery-operated electric hand lanterns, flashers and emergency lights.

United States Rubber Co., 1230 Sixth Ave., New York, N. Y. 10020
Safety footwear.

United States Safety Service Co., 1535 Walnut St., Kansas City, Mo. 64108
Industrial eyewear and hearing protection.

Vinyl Plastics, Inc., 1825 Erie Ave., Sheboygan, Wis. 53081
Conductive flooring.

Wagner Sign Service, Inc., 3100 Hirsch St., Melrose Park, Ill. 60160
Changeable copy displays for employee relations and safety programs.

Watchmocket Optical Co., Inc., 232 W. Exchange St., Providence, R.I. 02903
Safety goggles, respirators, face shields and safety signs.

Welsh Mfg. Co., 9 Magnolia St., Providence, R.I. 02909
Respirators, safety spectacles, goggles, safety hats, faceshields, and welding helmets.

Wheeler Protective Apparel, Inc., 224 W. Huron St., Chicago, Ill. 60610
Industrial safety apparel.

Whelen Engineering Co., Inc., 3 Winter St., Deep River, Conn. 06417
Emergency and warning lights, flashers, and beacons.

Willie Optical Co., Inc., Schreve Ave. & N. J. Turnpike, Barrington, N. J. 08007
Safety eyewear.

Williams Jewelry and Mfg. Co., 4544 N. Western Ave., Chicago, Ill. 60625
Safety plaques, trophies, awards, emblems, badges, and incentives.

Wilson Products Div., Electric Storage Battery Co., 2nd and Washington Sts., Reading, Pa. 19603
Personal protective equipment for industry.

Edmont-Wilson, 1200 Garfield Ave. S. W., Canton, Ohio 44706
Rubber, neoprene, and plastic gloves.

Wire Rope Corp. of America, Inc., 609 N. 2nd St., St. Joseph, Mo. 64502
Wire rope slings.

Workton, Inc., 64 New York Ave., Huntington, N. Y. 11744
Special purpose clothing—acid-resistant, flint-free, static free and fire retardant.

D. W. Zimmerman Mfg. Inc., 146 S. Westwood Ave., Toledo, Ohio 43607
Lifting equipment.

American Industrial Hygiene Association, 14125 Prevoist, Detroit, Mich. 48227
Information about associations activities.

American Medical Association, Council on Occupational Health, 535 N. Dearborn St., Chicago, Ill. 60610
Occupational Health literature.

Chicago Fire Department
Information on the work of the Fire Prevention Bureau.

Chicago Police Dept., Traffic Div.
Traffic safety.

Inter-American Safety Council, 140 Cedar St., New York, N. Y. 10006
Safety publications, visual aids, and films, in Spanish for industrial, highway, and home.

National Ski Patrol System, Inc., 828 Seventeenth St., Denver, Colo. 80202
Ski safety.

Outdoor Power Equipment Institute, 734-15th St., Washington, D. C. 20005
Power lawn mower safety.

Prevention of Blindness Inc., National Society for the, 16 E. 40th St., New York, N. Y. 10016
Literature and information on industrial and vocational school eye health and safety programs.

President's Committee on Employment of the Handicapped, Washington, D. C. 20210
Information on Hire-the-Handicapped Program.

U.S. Coast Guard, Washington, D. C. 20226
Boating safety.

Eastman's Laboratories, Inc., 207 E. Ohio St., Chicago, Ill. 60611
Product testing.

University of Southern Calif., Los Angeles, Calif. 90007
Safety research.

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PLAN NOW TO ATTEND THE



1967

NATIONAL SAFETY CONGRESS
OCTOBER 23-26, 1967 / CONRAD HILTON HOTEL, CHICAGO

1968

The Congress is always a big week, a worthwhile week for the 13,000 safety people who attend.

1969

At the '67 Congress you can meet other safety people, with the same problems and responsibilities as yourself. You can exchange views and ideas on accident prevention, health, hygiene, and fire prevention . . . on safety in industry, traffic, school, at home and on the farm.

1970

You can see the largest of all safety equipment exhibits at the Congress . . . an opportunity for you to make well-informed buying decisions for your company.

1971

This four-day educational program, planned and presented by the National Safety Council, can be your most thought-provoking, most worthwhile safety experience in 1967.

Make plans early to attend the 1967 Congress and bring the other people in your organization who have safety responsibilities.

FUTURE CONGRESS DATES	
1967	October 23-26
1968	October 28-31
1969	October 27-30
1970	October 26-29
1971	October 25-28

NATIONAL SAFETY COUNCIL
425 NORTH MICHIGAN AVENUE • CHICAGO, ILLINOIS 60611

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pure oxygen rushing through a small orifice of the regulator nozzle generate heat?

Would you have the three legs of the combustion triangle inside this regulator? (Fuel, oxygen, and heat).

What would happen? This? (Show the blown up regulator.)

How Can We Guard Against This?

1. Disconnect the oxygen regulator and connect the SAF-T-PAK regulator.
2. Show how the safety check valve on the SAF-T-PAK regulator stops the reverse flow of gas.
3. Insert Smith's SC219 with Flo-Trol and demonstrate the built in check.

Burning Rate of Steel

Experiment XII.

1. Take a milk bottle, into which you have previously inserted a piece of asbestos paper saturated with water. (This should be lying flat on the bottom of the bottle.) Fill the bottle with pure oxygen from the torch.
2. Light a small piece of steel wool with a match to show that the match will raise the steel to its kindling point.
3. Drop the piece of steel wool into the milk bottle filled with oxygen and call attention to how rapidly it burns in the oxygen atmosphere.
4. Indicate that this experiment ties in with Safety Rule No. 9 and caution the audience about what could happen if the oxygen should come in contact with grease on clothing or if a person lights a cigarette when his clothing is saturated with pure oxygen.

Review each safety rule to determine if the objective has been accomplished. The audience now compares their understanding

of the reasons for these rules to how they felt about them through the first run through the rules.

Grand Finale of Safety Meeting.

1. Fill green balloon with oxygen only. Ask audience, "What will happen when we touch the balloon with flame?"
 2. Fill red balloon with acetylene only. Ask the audience if there is sufficient oxygen in the surrounding air to burn all of the carbon of the acetylene.
 3. Fill a small yellow balloon about four inches in diameter with equal amount of oxygen and acetylene. Ask "How much pressure, *psig*, is there in this balloon?"
 4. Set off the oxygen balloon with test flame. Note the disappointing "pop".
 5. Set off the acetylene balloon. Note the heavy black carbon residue.
- Attention:* Before setting off the (yellow) oxy-acetylene mixture balloon, ask audience to cover their ears and react to their hearing aids.
6. Set off the yellow balloon, but be sure your own ears are protected.

After explosion, compare the mixture which was low in pressure in the yellow balloon and the 2,200 *psig* in the oxy-acetylene mixture when it is attached to a full gas inlet. Is there any question how this could have happened? (Again show the blown up regulator.)

In closing, let us be mindful that, in calculating the effect of an accident, you may come out with this answer:

ACCIDENT: (—) Subtracts from your pleasures.

- (+) Adds to your miseries.
- (:) Divides your income.
- (x) Multiplies your worries.

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2nd General Chairman

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2. Give recognition for good individual records of safety.

3. Keep good records, provide a follow-up and take some kind of disciplinary action on those who will not act in a safe manner.

The Oklahoma Department of Highways started a safety program a few years ago, and as you will probably agree, maintaining public employee interest in a safety program is unusually difficult due to the nature of public employment. However, the training program did stimulate enough interest and added knowledge so that there was a marked reduction in accidents on the job. As proof of this, the Department was able to turn as much as \$16,000 back to the workers' compensation fund in one year.

Prior to the last two years, the accident rate for our Oklahoma Highway patrol cars had been relatively high, until we started a defensive driving course and refilled on accident records to lead us to change the color of the flashing warning lights on the back of the cars from red to amber. We learned that the amber light gives our troopers and their cars better protection. Apparently this is true since red has become so commonplace.

Training is essential, but let us never forget that practically all human endeavor, from the cradle to the grave, is based on awards. The baby learns to walk by striving to get something that is held out of his reach by his parents. When he walks he gets the reward.

A student in school is recognized for excellence in scholarship. An athlete strives harder when he knows he will receive the cheers from the crowd. The military gives medals, ribbons, badges for outstanding services. Awards are given for church activities that are above the routine.

Give recognition its due place in your program because if you don't, others will pass you in their safety efforts as they use this lever.

Because there are many people who will not, or do not have enough reason to, safely, there must be an effective follow-up and, if necessary, disciplinary action, on

though it may be distasteful for you to administer.

In the Highway Patrol, we found that the Accident Review and Screening Board which places the blame for unsafe acts made a strong impression on many of our men who did not react in the desired manner when we used a milder approach. When the Board starts talking about actions which effect the pocketbook and job security, we gain a renewed interest in the program.

Again I refer to this as a controlled situation which you have to a very high degree in industry and in public employee groups. It appears that you must take advantage of this situation through necessary because of the great amount of injury, death and time lost in your organization.

By nature, most people are gamblers who like the thrill of taking a chance. Many of them seem to thrive on the game of chance. Speed provides the stimulant of thrill and tingling spine. They take short cuts to save time so they can go to the races, the circus where they see the dare devils, and to the T.V. programs that are tense with danger.

All of this seems to be a necessary ingredient in their daily working, recreational and home lives.

We know this and it is my belief that we must accept it if we are to deal effectively with this mass problem in our society. You should take advantage of the controlled situation in your department and:

1. Be sure that you have taught the employee to act safely.

2. Give recognition for good individual records of safety.

3. Keep good records, provide a follow-up and take disciplinary action if warranted.

We must do the best job that we can with the knowledge at hand. Let us not be too hopeful that someone else will come up with a magic formula. Let's create our own formula through dedication and determination.

Administrators must not overlook the opportunity or responsibility to provide an effective safety program for their employees.

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RUBBER SECTION

DUST CONTROL IN THE RUBBER AND PLASTICS INDUSTRY

By L. F. DIERINGER
Regional Industrial Hygienist, United States Rubber Co., New York, N. Y.

In the rubber and plastics industry many powdered or particulate materials are used which are capable of becoming air borne under the right conditions. These materials include (1) chemicals such as sulfur, anti-oxidants, accelerators, and metallic oxides, (2) reinforcing materials such as carbon black and hard clays, (3) inert fillers such as cotton sheering, hydrated silicas, and asbestos, (4) pigments such as iron or chromium salts, (5) processing aids such as talc and zinc stearate, and (6) rubber and plastic dust from mechanical action.

When these dusts are dispersed into the workroom atmosphere, they are capable of causing two types of hazards about which we are greatly concerned. One is the explosion and fire hazard, the other is the toxic or occupational health hazard.

For an explosion and fire hazard to exist, the necessary conditions are a sufficiently dense dust cloud, adequate oxygen, air, or other supporters of combustion, and an ignition source intense enough and in contact with the dust long enough to raise the temperature of part of the dust mixture to the ignition point. Reducing any one of these conditions will materially reduce the chance of an explosion to occur.

From a toxicological or health standpoint, a hazard is normally considered to exist when there is exposure by inhalation to atmospheric dust concentrations high enough to have an adverse effect on the health of the worker. Over the years threshold limits have been established for exposure to many of the types of dust encountered in the rubber industry. It should be realized that dust concentrations necessary for explosion are much higher than those generally considered from a health standpoint. It is for the purpose of preventing these hazards that existing dust control measures are necessary.

Dust control measures are nothing new. The Chinese, centuries ago, used crude ventilation methods in an attempt to reduce exposure to coal dust in coal mining. Today we must apply extra energy and do a better job. When we talk dust control today, we normally think of ventilation first. Actually, this is only one method and we should not be limited to this method alone. Other methods may provide better control, reduce maintenance problems, and, reduce material or product cost.

I would like to illustrate various approaches to dust control in the rubber and plastics industry.

1. A very dusty operation existed some years ago in one of our plants where bales of synthetic rubber were opened. The synthetic rubber bales were coated with talc. The bales were stored in a large room about 200 ft. long. Very high dust concentrations resulted from the opening of the bales and movement of the bales to production. The question was how to solve this problem. Attempts to ventilate were impractical because of the large open area.

Some years later, someone came up with the idea of packaging in polyethylene plastic bags, eliminating the need for talc and resifting in a considerable saving. Now, plastic bags and all are dumped in the mills. The dust problem has been completely eliminated. The solution was process change, not ventilation. Sometimes, taking a fresh look, as was done here, will result in a better and/or lower cost product.

2. A common problem in most mill rooms was the handling of carbon black, resulting in very messy work areas. A program was undertaken in the company over a four-year period, involving over a million dollars, to improve the mill room appearance by installing ventilation. This, however, completely solve the problem. It was not all

bulk handling procedure was being used that dramatic improvement was achieved. 3. A talc dusting machine was installed for talc dusting brushes were used to spread talc on tubing was a constant source of irritation. Dust concentrations were very high, a lot of talc was required, and dust work wore out fairly fast. Dust concentrations were reduced by altering the ventilation, but they were still too high.

The solution was a change in process. In place of the brushes, an electrostatic powder coating machine was installed for dusting the tubing. Dust concentrations are now down below the threshold limit and consumption of talc has decreased from 800 to 150 pounds per eight-hour shift. A considerable saving resulted from a change to a process which does not depend on ventilation.

4. Hand dusting of tire tread with talc (as it used to be done) was would be expected, produced high dust concentrations. Now, a liquid slurry of talc is sprayed on the tread eliminating the dust problem.

5. Another plant was experiencing considerable trouble with fires during the emptying of bags of powdered sulfur into a sulfur bin. In the operation, the workman carried a bag of sulfur on his shoulder to the bin opening, slit the bag while it was on his shoulder, and dumped the sulfur into the bin. Occasionally, after several bags were emptied and the sulfur dust concentration had a chance to build up, static charges would cause a small explosion and flash fire. Fortunately, the operator in each instance suffered only minor face and arm burns.

The first attempt to solve the problem was to install a grounded grid across the top of the bin, with the thought that the grid would remove the static charge developed during the emptying of the bags. Explosions still occurred occasionally. Next, the bin was kept as full as possible, with no success. The final solution was the substitution of an oil impregnated sulfur for the powdered sulfur to keep dust and static charges to a minimum.

6. The ultimate in dust control was achieved in one of our plants by the complete automation of the Banbury loading operation. In dumping carbon black from a Scabbler into a hopper, the amount of dust escaping

is dependent on the efficiency of the operation in connecting the sleeve to the chute. Each hopper has an exhaust near the top that draws away the dust. Hopper doors are kept closed except during filling. The chemicals are conveyed by belt conveyor to a cub. Exhaust over the side picks up dust in suspension. This is another example of ventilation not being the final answer.

7. The last example I would like to use is a somewhat different dust control approach. Where asbestos dust may be encountered in fabricating asbestos-filled products, a good combination of mechanical and environmental hygiene practices can be used effectively to control such exposure.

I have used these examples to point out that ventilation is not necessarily the final answer and that you should see if there are other more practical control methods that can be used before considering ventilation. I suggest that you first consider if it is possible to substitute a less toxic or hazardous material. Secondly, ask if there is a better way to do it. Is it possible to make a process change? Some of the above examples illustrate such process changes.

If it is not possible to solve the problem by these methods, then consider ventilation. In most instances the last method is forced exhaust ventilation, trapping the dust at the source to prevent its dispersion into the workroom atmosphere. You must realize that any ventilation system is only as good as the maintenance applied to the system equipment. Any ventilation system, to remain effective and efficient, must include a good preventive maintenance program. Dust work must be inspected periodically for leaks and corrosion; motors and fans inspected for play, wear, and proper operation; and necessary repairs made when needed. When trouble is encountered, don't forget to make sure the exhaust fan is not running in the reverse direction, a too common condition.

Finally, only as a last resort should you consider the use of respiratory protective equipment for other than emergency purposes. Although efficient respiratory equipment is available for use against many of the contaminants encountered, too often it is not used correctly or the wrong respirator is used. It is very difficult to expect a worker to wear a respirator all day, especially in warm weather. I would like

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conditions. Too many times we find the respirator around the neck of the worker, or hanging on a nail. Personal respiratory equipment should be considered a last resort or as standby protection, never as a substitute for effective engineering control.

With the increase in attention to community air and water pollution, a thorough study should be made before any changes or alterations are made to existing control methods or new equipment installed, to make sure that new factors of pollution are not being introduced or old conditions pyramided. An example might be carbon black dust. Exhausting to the outdoor causes unsightly air pollution. Use of water scrubbers

to control air pollution may introduce a problem of water pollution. Today, this is going from the rising pan into the fire. Carefully consider such possibilities before instituting new control procedures.

Many times, trouble can be avoided if control measures are engineered in when initial plans for a new operation or alterations of an existing operation are developed. Adding control measures at a later date is generally more expensive than when they are engineered in at the beginning, and may also not be as efficient.

In summary, when we consider dust control measures, we should ask ourselves, "Is there a better way to do it?"

"Each supervisor is going to explain in person to the plant management the cause of each accident. Questions may be rather embarrassing.

L. N. Walters,
Production Superintendent"

L. N. Walters,
Production Superintendent"

List of Characters:

Chief Crane, General Foreman
Sam Hill, Union Steward and co-worker
Bill
Danny (accident repeater employee), Operator, Winding Crew
John Barr, Shift Foreman
Jim Pearson, Safety Engineer

One morning, shortly after the announcement of the new safety policy, the following occurred in Department "A." John Barr, one of the three shift foremen in the department, was talking with Jim Pearson, Safety Engineer.

John Barr: "Crane has decided to give Danny a write-up for having too many accidents. Now you just watch and see; I'll bet he has me do it. The damn thing is written up and in his office now, but you wait and see—I'll wait until the last minute and tell me, 'You call Danny in.' And boy, Danny will go right through the ceiling. When Danny sees that, he'll really blow his top."

Jim Pearson: "Danny has had a lot of small injuries lately but nothing serious."

John Barr: "No, nothing serious, but he's kind of like a cry baby. You know, if he hits his hand a little bit he demands an X-ray and all that sort of stuff. That's what makes his record look so bad. But this was Crane's idea. I noticed on the write-up that he put down that he had 'discussed this with the shift foreman.' Maybe he discussed it with the other two, but he sure didn't talk with me about it, and Danny has been on my shift now for three months. I didn't even know about it, but now it makes it look like it was my idea, too. I think their policy's wrong. I think the outcome of this will be that the men won't report their accidents—like in that campaign a while back

(NOTE: Mimeographed copies of the four going Part I were given to delegates attending the Monday afternoon luncheon and Tuesday session. On Tuesday afternoon, the delegates were asked to discuss their actions after watching the following skit.)

Part II

when they were asked to report accidents as soon as they happened. The union is liable to raise hell about it, too."

About eleven o'clock Barr, acting upon Crane's instructions, brought both Danny and Sam Hill, the union steward and a co-worker on Danny's crew, to Crane's office. About an hour later Pearson observed Danny and Hill leave the office, talking with each other, and return to their work station. Seeing Jim Pearson, the Safety Engineer, Sam Hill called to him from where he and Danny were working.

Sam Hill: "Hey, I know one S.O.B. we can run for president. Danny was just talking to him."

Sam Hill (to Danny): "Did Crane give you a write-up on it or what did he say?"

Danny: "I don't know. Crane is going to think it over for a few days."

Later, during a routine tour of the operation, John Barr approached the winding crew. Hill was wrapping some nylon tape on a wrapping machine. Seeing the shift foreman, Hill said:

Sam Hill: "Hey, I can't wrap this stuff any more—it isn't safe! Why don't you get that top roller fixed. I told you three weeks ago to get it fixed and it's not done yet. That's what causes the injuries around here."

Barr attempted to reply to Hill, but to Barr it appeared that the union steward had almost lost control of himself. Hill continued for several minutes, cursing the shift foreman and the company. Finally Barr walked away and Hill subsided.

Danny: "You shouldn't blow your top that way."

Sam Hill: "I know I'm right, and so I don't care what they say."

As lunch Barr told Sam Hill and Pearson about Hill's "blow up" and that he was

AN EXERCISE IN SAFETY MANAGEMENT TRAINING

By G. W. NICKEL

Manager of Safety, Armstrong Cork Co., Lancaster, Pa.

Part I

Several years prior to 1960, the Robinson Company's monthly safety reports had shown the Woodville Plant as having one of the poorest safety records among the company's nineteen plants. The Woodville Plant ranked at or near the bottom in frequency of disabling injuries and duration of absence because of industrial accident. Workers' compensation costs for Woodville for the two previous years exceeded costs and budget allocated to that plant by the central office.

On July 3, 1960, as an effort to improve the plant's safety record, the production superintendent sent the following letter to all general foremen with instructions to discuss it with the shift foremen under their supervision:

"During the past eight months much has been said and written about cost reduction. Each foreman should and must be an efficient manager, and his desire to reduce costs must embrace safety. We must eliminate waste, which includes the elimination of accidents—something we definitely have not accomplished. We need a stern, mandatory program

1. Know your safety procedures and be able to spot bad practices.
2. Train new employees thoroughly.
3. Treat cases of safety-rules violations the same as if the employee was in subordinate or failed to follow work specifications. Use write-ups or, if serious enough, send the employee home.
4. Show your displeasure toward accidents, as if the employee deliberately caused the accident—accidents are a blot on your record as a foreman.
5. Don't let up—constantly talk safety to your employees.
6. Records of minor and major accidents should be compiled for each employee, with a review taking place periodically between employee and supervisor. Action must be taken with prone employees.

GLASS AND CERAMICS SECTION

NATIONAL SAFETY COUNCIL 1966-67

I specifically mentioned transport drivers. I was of course, referring to companies who employ a relatively few people as transport drivers, and not the great trucking industry. The monumental efforts in safety training and controlling highway drivers made by the trucking industry is living proof of what can be achieved in the field of driver training. The average highway transport driver of today is well-worth of his title, "gentleman of the road." If the trucking industry can achieve this high level, surely we can train and instruct drivers within the four walls of our plants, and achieve a similar success.

Each plant, each organization, has its own peculiarities and it would be difficult to suggest a driver training program tailored exactly to the needs of all organizations, both large or small. However, it is possible to establish basic concepts covering the "Who? — What? — How? — Why?" of driver training that would be applicable to large or small organizations.

This can perhaps be best defined in some written terms of reference that clearly outline these facts and may take the form of a policy letter, or other written procedure. The formal promulgation of a policy such as this has the advantage of clearly informing all concerned what has to be done and ensures the cooperation of all levels of employees.

The next questions to be answered, as we organize our driver training, are "Who will we train?"—and "What will we tell them?" It is necessary to produce, or adopt, an operator's manual which contains all established safety and vehicle operating procedures and is issued to all trainees for future reference.

It is most important that when an employee successfully completes any phase of a driver training program, this is recognized and recorded with the issuance of a safety permit to the employee. A safety permit does many things to many people and should be an integral part of a driver training program:

1. It recognizes a degree of driver ability.
2. It conveys a sense of accomplishment to the employee.
3. It forms the base of your driver training records.

4. It provides a something that can be revoked temporarily or permanently as a consequence of continuing unsafe driving habits.

The content of a driver training course should be as simple and direct as possible. We should remember that we may be attempting to train out of some of the more senior employees had driving habits that have gone unheeded for years. Action in such cases might entail a complete change of attitude on the part of a driver and his total acceptance that what we are trying to teach is not only the safe method, but the right and the easiest method. The words "safe," "right," and "easy" can convert cowboys!

Course content should contain as much local background as can be worked into it. For instance, if you use slides in your training presentation, take the pictures for the slides in your own plant, using your own employees as subjects. This will certainly stimulate a great deal of interest with your drivers and help them to understand that what you are talking about does affect your plant and not some unknown, remote location perhaps a thousand miles away.

Let's review some of the basic requirements of a good driver training program:

1. *You* — the already hard-worked safety engineer who will willingly and enthusiastically sell management on the need for a driver training program in your location.
2. A policy statement or written procedure that spells out details in terms of responsibilities and people involved.
3. Training course material (a camera and some imagination will help).
4. A driver's manual containing all safe driving rules, safe operating procedures, and other pertinent material.
5. A safety permit system.

In conclusion, good, safe-working material handling equipment operators are not born that way — they are trained.

If you are plagued with a high incidence of accidents caused by improper vehicle operations, don't just stand there and blame the driver — maybe someone hasn't time to tell the driver what he ought to know. Remember "If the pupil hasn't learned it because the teacher hasn't taught."

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UP-TO-DATE INDUSTRIAL HYGIENE WHAT'S NEW IN INDUSTRIAL HYGIENE

Opening Remarks

By JACK RADCLIFFE
Supervisor Industrial Safety Section, Ford Motor Co.; Past Chairman
Occupational Health Hazards Committee, NSC Industrial Conference

Radcliffe:
This session is co-sponsored by two groups, the American Industrial Hygiene Association and the American Association of Industrial Nurses. There will be four key speakers and the subjects tend to inter-relate. At the conclusion of the papers we will have a question and answer period.

With the co-sponsorship of the American Industrial Hygiene Association and the American Association of Industrial Nurses, we have on the platform with us today their two presidents. First, William T. McCormick, president of the American Industrial Hygiene Association and Assistant Director in charge of Occupational Hygiene in the Medical Department of Inland Steel Company, Chicago. He is also a member of the American Society of Safety Engineers, and many other related safety and hygiene groups.

McCormick:
The American Industrial Hygiene Association is most pleased to be a co-sponsor of this program on Up to Date Industrial Hygiene. I am particularly pleased that the ladies who make up the membership of the American Association of Industrial Nurses are also co-sponsors this morning.

In our company, the groups who are concerned with the health of workers both directly and indirectly enjoy a cordial and cooperative relationship with each other. This has been a benefit to both workers and the company alike. I think it is extremely important that those of us who have interests in the well being of people have the opportunity to meet together as groups periodically to share our information and to assist those in the common goal that we have. The program this morning consists of outstanding speakers; I'm sure each has a message

for us to take back to assist us in our program. It gives me great pleasure to represent the American Industrial Hygiene Association this morning and to bring you greetings from its members.

Radcliffe:
The president of the American Association of Industrial Nurses is employed with the Guide Lamp Division of General Motors Corporation. She is a registered nurse and has done hospital work, private duty, supervision and industrial nursing during the last 22 years, has worked on many committees and given many papers. She is a most active member of the industrial nurses in this country. Without them, our medical, hygiene and safety programs would be lacking. It is my pleasure to introduce to you the president of the American Association of Industrial Nurses, Mrs. Edna Watson.

Mrs. Watson:
We are most happy to have been invited to co-sponsor this session in the Safety Congress and, on behalf of the Board of Directors of the American Association of Industrial Nurses, I thank you for being able to share this experience with you.

As industrial nurses, we are especially interested in all phases of safety and hygiene in our various job situations. As individuals we are vitally concerned with safety at home, school, on the highway, or wherever we find ourselves in a community setting, not only for ourselves and families but to be better informed and thus more effective as occupational health nurses.

We hear much today about the team approach to health, preventive medicine, and away from work. We, as industrial nurses, take a combined effort of all

realize the goal of a safe, healthy environment in which we work, live, and play. It takes knowledge, understanding and cooperation to have an efficient, effective safety program. That is why we are pleased to have a part in this session and you are to be congratulated in making it possible for all of those who are interested in safety to come together to share ideas and learn what part they can play in the accomplishment of an effective program.

We as industrial nurses need to learn to be better prepared to care for the health and safety of workers on the job and to be able to answer questions about safety away from work. As an association, we're glad to be a

WHAT HEALTH, SAFETY AND PLANT PERSONNEL SHOULD KNOW ABOUT DUSTS, FUMES, MISTS, GASES, VAPORS, AND NOISE

By WARREN A. COOK
Professor of Industrial Health, Department of Industrial Health,
School of Public Health, The University of Michigan,
Ann Arbor, Mich.

A quick answer to what should be known by health, safety, and plant personnel about hazardous materials used in the plant is—everything! Practically, the extent of the knowledge must necessarily fall somewhat short of this Utopian goal. There are a number of categories of information which should be known. I propose to explore a number of these.

Perhaps the most critically needed information is that concerning materials which may cause serious illness or death without the worker realizing that he is being subjected to a dangerous atmosphere. An example of such material is one which has resulted in only some 20 deaths as reported in the literature over the last fifty years, and only three reported cases since 1950. Certainly, such a material should not deserve too great emphasis among the myriad of substances which compete for a place in the overall knowledge of health, safety, and plant personnel. But let us consider what the actual facts may be.

participating in this worthwhile project for fulfilling the purpose of our organization. This we can do by taking part in meetings such as this with other national associations who have similar goals and purposes. Since health and safety are so closely related, you cannot have a good health program without a good safety program. One complements the other, for a healthy productive worker must have a safe work environment.

By working together, to recognize safety hazards and cooperating to eliminate them, we can make the environment of the American industrial worker the most healthy, safe, and productive place in the world.

In January, 1966, a worker in California was brazing metal parts, using a silver solder. After some two hours of work, he began to feel bad and the next day experienced some tightness of the chest, was coughing, and felt that he had been exposed to too much welding fume. As the condition worsened, he called a physician and they agreed that he must have permitted himself to be exposed to excessive welding fume. He was treated symptomatically. On the fourth morning after the exposure he was found dead in bed. Within a short time after this, a second worker on the same job became affected. By this time, it was known that the silver solder contained over 20 percent cadmium and that the condition was actually due to excessive exposure to cadmium fume. Following the report of this fatal and accompanying nonfatal case, 10 additional cases were reported to the California Bureau of Occupational Health, three of these fatal. A detailed history of the circumstances of the two cases is to

be published soon by Dr. Hector P. Blier of the California Department in the *Journal of Occupational Medicine*.

Here we have an example of a material which does not immediately become excessively irritating; one concerning which we have not had too many published reports of difficulty. Very possibly, the reason for this was that cases may have occurred but, being sporadic, they have not been recognized nor published.

Since a welder or a worker engaged in brazing operations may have been using solders over the years containing no cadmium, and then such a solder is required for the next day's work, it is vital that not only the health and safety personnel but also the foreman in charge of the operation should be well informed concerning the hazards from cadmium oxide fume.

Another example of hazardous materials in this category is chlorinated naphthalene. This waxy material is melted in order to impregnate wire or cable insulation or electrical condensers. The vapor from this synthetic wax condenses in the air above the melting pot as a fume. On being inhaled in excessive amounts it may cause serious and even fatal liver damage.

Among the earlier fatal cases as result of such an exposure, one worker died with a diagnosis of yellow atrophy of the liver. At that time there had been no such experience with this material and it was thought that the fact that this worker was a rather heavy drinker may have led to his death. A second worker continued the operation. When he developed a liver condition which also terminated fatally, but with no history of alcoholic beverage consumption, investigations were initiated which definitely implicated this harmless looking and non-irritating synthetic wax as the producer of these liver conditions.

As further categories of knowledge concerning hazardous materials, we should include those materials actually in use in a plant, together with those which may be contemplated for early future use. Possibly the best and earliest source of information concerning such materials is through the purchasing agent. Accordingly, it is strongly recommended that a close liaison be set up even the purchasing agent and the health safety personnel so that early information

will be provided concerning materials in use and those which are to be ordered. These materials may best be discussed in categories related to their physical and physiological properties.

Among the most important categories are the dusts that produce the pneumoconioses. In the major industries involving exposure to silica dust, there tends to be a good knowledge of the fact that too much of these dusts will cause a lung condition which may be disabling. Where the dust may contain crystalline free silica, such as is the case with molding sand in the foundry, or granite dust in a quarry or stone cutting shop, it is well understood that the greater the percentage of free silica in the dust the lower the dust concentration should be in order to avoid the development of silicosis. It is known that workers should be given periodic X-ray examination, and that the extent of the dust exposure should be determined by air analyses, with control measures such as will be discussed later in this session.

Less knowledgeable, as a rule, are health and safety personnel concerning such exposures in those operations where crystalline free silica may be used rather incidentally in an operation at a plant not normally considered to be a dusty industry. An example would be the use of silica flour as a filler in a paint mixture or as inert material in a variety of products.

Asbestos has been much in the daily newspapers over the last year or two, not so much because of its action in causing asbestosis, but because of the association of a cancerous condition known as mesothelioma which has been found among workers with asbestos in far greater incidence than among the general population.

Talc and soapstone powders are used in such industries as rubber goods manufacturing, and may introduce appreciable amounts of such dusts into the air. Whereas most dusts made up of silicates are essentially inert and, as such, as much as 50 million particles per cubic foot of air may be considered acceptable, these two minerals have been found to produce disabling pneumoconiosis in lesser concentrations with the result that no more than 20 million per cubic foot of air is considered a limit.

This, however, is not the whole story. In connection with talc and soapstone. Not infrequently, these two minerals are found to have some quartz content; this may be as much as 20 per cent. Application of a formula given in the *Threshold Limit Value* list of the American Conference of Governmental Industrial Hygienists to a talc or soapstone dust with 20 per cent quartz limits the exposure to only 10 million particles per cubic foot of air. Consequently, when such materials are being used, it is essential to have the additional bit of knowledge as to percentage of crystalline free silica.

Somewhat the same situation occurs in connection with a dusty material made up of diatomaceous earth, a form of amorphous silica. The natural material has been found to cause a disabling silicosis when the exposure exceeds 20 million particles per cubic foot. However, where the diatomaceous earth is subjected to a calcining operation, some of the amorphous free silica changes over to the crystalline form known as cristobalite. Depending upon whether the diatomaceous earth is calcined with or without a flux, the percentage of the cristobalite may be in the order of 20 per cent or 30 per cent; the latter with the flux calcining. Applying the ACCIHI formula, these calcined diatomaceous earths should be kept either to 10 million particles per cubic foot or to seven million, in order to avoid lung injury.

In the category of metals, we would expect that all health and safety personnel are familiar with lead as an occupational hazard and that proper precautions are taken to prevent excessive exposure. In spite of this general knowledge, lead poisoning cases continue to occur in industry, not only in the industries that have produced the greatest number of cases over past years. After a report in the literature that lead poisoning cases were occurring in plastic manufacturing in Italy and a subsequent report of such cases in this industry in France, a group of lead poisoning cases occurred in a plastic manufacturing operation in this country. Possibly if a close relationship had been maintained between the purchasing department and the health and safety personnel, the exposure might have been brought under control without occurrence of cases.

Beryllium is well known as a producer of serious and fatal occupational disease.

This, however, is not the whole story. In cases, and it is felt that much of the hazard concerning beryllium when manufacturers or their phosphors in June 1919. This metal has many desirable properties and is finding increasing use in a diversity of operations in all plants where high temperature resistance and safety personnel should be alert to the introduction of this material. As an indication of relative hazards, the exposure to beryllium should be kept to about a hundredth of that considered permissible for lead.

It would seem that everybody is well informed concerning carbon monoxide, the gas which is responsible for more exposures than any other, and also the gas responsible for the greatest number of cases of fatal asphyxiation. In areas where there is an active possibility of escape of gases containing carbon monoxide, there tends to be an increasing use of multipoint carbon monoxide alarms. Such installations have been placed in a number of blast furnace plants where carbon monoxide concentrations of the gas are in the order of 20 or 27 per cent.

Fortunately, for most fuel gas purposes natural gas is coming into increasing use and this, of course, contains no carbon monoxide. Furthermore, where in earlier years supplementary gas supplies have been provided through water-gas or producer-gas installations, these are today being replaced by liquid petroleum gas with no carbon monoxide content. It is, of course, important always to keep in mind that imperfect combustion of natural gas or L.P.G. will produce a sufficient amount of carbon monoxide to cause asphyxiation. Cases of carbon monoxide asphyxiation have occurred over the years on Monday mornings where cold systems are being heated with natural gas. Here, the impingement of the burning gas on cold surfaces interferes with complete combustion with markedly greater amounts of carbon monoxide in the products of combustion.

Among the gases which might well be listed with those which may cause carbon death is hydrogen sulfide. The worst case of liberation of hydrogen sulfide in an occupied area occurred in Plaza Riva, Mexico, where liberation of hydrogen sulfide at a gas and oil field caused deaths and several hundred cases of serious illness. Quite hospitalization, with hydrogen sulfide is having recovered from petroleum

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and made into elemental sulfur, an emergency plan should be set up in the event of rupture of hydrogen sulfide lines with possible escape of large volumes of this gas.

Hydrogen sulfide is formed wherever there is decomposition of materials containing sulfur under reducing conditions, and cases of multiple fatalities, from two to five, have occurred. Wherever materials containing sulfur are being handled, all workers should be briefed about the rapidly asphyxiating properties of this gas. It should be emphasized that at the higher concentrations the sense of smell does not provide the warning to which one is accustomed on exposure to the lower concentrations of hydrogen sulfide. Workers should know ahead of time that, if one of them should collapse in some confined area where hydrogen sulfide could be the cause, the fellow workers should not enter the confined area to rescue the victim without gas mask protection. The usual precautions of providing watchers outside the confined area, provision of a proper harness with rope attached for rescue from the outside if required, and availability of adequate ventilation together with grab sample checks on the hydrogen sulfide concentration within the area should, of course, always be the practice.

A category of hazardous materials which includes many substances found in practically all plants is that of the solvents. A complete list of all solvents used in the plant should be maintained. Where proprietary solvent mixes are utilized, every effort should be made to determine the constituency of these or, in any event, whether solvents with threshold limit values of less than 100 parts per million are included.

With the extensive publicity given to the severe health hazards of carbon tetrachloride, it would seem that everybody knows that this should not be used as a general solvent. However, the experience has been repeated many times in which a highly toxic solvent has been substituted by one of less toxicity but at some later date the more toxic solvent, desirable for good solvent properties or low price, has been brought back into the plant without the health and safety personnel being aware of its re-introduction.

Increasingly, methyl chloroform is being recognized as a desirable substitute for carbon tetrachloride as it includes the attributes

of eliminating a fire hazard and, in addition, has the advantages of low toxicity together with good solvent properties and a vaporization rate close to that of carbon tetrachloride.

It is to be noted that the hazard of a solvent depends on other properties than the threshold limit value, perhaps most prominent being the vapor pressure and corresponding boiling point. It is to be pointed out that even such a slightly toxic solvent as methylene chloride with its threshold limit value of 500 parts per million has caused fatal poisoning where its great volatility has resulted in build-up of concentrations higher than this value. Solvents with low vapor pressures and high boiling points often may be safely used with open surfaces at room temperatures but, if the operation involves heating the solvent, then there is always the possibility that even the high boiling point solvent may be vaporized sufficiently to exceed acceptable concentrations.

In past years, the use of petroleum solvents has indicated a low order of toxicity since these could be expected to be made up of aliphatic hydrocarbons. Today, there is much increased probability of presence of aromatic hydrocarbons from petroleum sources. It should be kept in mind that the aromatic hydrocarbon content may change with the same supplier from time to time and constant vigilance is necessary to make sure that the worker who may be exposed without injury to a couple of hundred parts per million of the petroleum hydrocarbon containing only aliphatic constituents may have his health seriously injured on introduction of aromatics. Benzene is, of course, the most toxic one of these ordinarily found in petroleum hydrocarbons.

The number of compounds that are implicated in the production of cancer of the lung, bladder, or skin appear to be on the increase. Epidemiological evidence points clearly to the chromium compounds as cause of lung cancer. Just how low the exposure needs to be to prevent this development among more susceptible people is currently not known. So far there seems to be evidence that a sufficient exposure occurs at chromium plating conditions to produce this condition. Certain niches are sufficiently effective in the collection of bladder tumors that the Source of Penns-

ylvania has passed a law, unprecedented in the United States, that two of these — benzonaphthylamine and benzidine—may not be produced or used in that state. Some years ago, on the basis of animal experimentation, it was believed that many of the high boiling oils from catalytic cracking operations in oil refineries were severe producers of skin cancer. Extensive control measures were instituted in many of the refineries to avoid contact with such oils. Over the years, observation has been continued of workers with some exposure to these oils and in a recent publication it was reported that the hazard to humans from this source does not appear to be as severe as initially contemplated.

Ionizing radiations of various types are increasingly common throughout industry today. Alpha, beta, and gamma radiations are the most frequent, but neutron exposure may also be a factor. Where sources of these types of energy are present, competent health physicists should survey the installations with appropriate instruments and make sure that adequate precautions are observed.

A final category that is not a material, but a vibration, is that of noise. In plant areas where it is necessary to use an elevated voice at a distance of a foot or so, or to shout in order to carry on a conversation, it is desirable to make a check of noise intensities with a sound level meter. Where the overall intensity exceeds 85 decibels, it is to be recommended that the sound level meter readings be supplemented with readings of intensities at sound pressure levels, certainly in the 300-600, 600 to 1200, and the 1200 through 2400 cycles per second bands. The American Academy of Ophthalmology and Otolaryngology recommends that the intensity in each of these bands should not exceed 85 decibels where a steady noise con-

tinuous for five hours or more per day contemplated.

The United States Air Force extends a range over which octave-band determination is made from 300 to 4800 cycles per second. An octave-band level of 85 decibels is considered that at which damage risk is minimum but the point at which personal ear protection is recommended. If an octave-band level reaches 95 decibels, it is considered that damage risk is great and personal ear protection is mandatory. Engineering control measures should be developed wherever possible when octave-band levels exceed 85 decibels.

A hearing conservation program should include not only noise measurements and evaluation but also audiometric testing of workers before being placed in excess noise areas and periodic testing thereafter. Personal protection admittedly has a place but noise control measures should be instituted wherever possible.

The health and safety personnel should avail themselves of the resources now available for obtaining information on these hazardous materials. A number of these are listed by later speakers in this session. It is to be emphasized that the threshold limit value does not tell the whole story of the hazard of the material but all factors such as vapor pressure, temperature, degree of confinement, extent of exposure, and duration of exposure are factors to be given consideration as well.

Only by being as completely informed as possible on all aspects of a material relative to the possibility of injury can there be wholly successful program in avoiding but outright occupational diseases and also provision of a workroom atmosphere conducive to the optimum well-being of the worker.

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self and his fellows, who uses his knowledge, tools, and safety equipment to the best of his ability.

It may be, however, that we are attacking symptoms rather than causes. We have, as I have said, begun to explore the nature and true cause of industrial accidents since it is apparent that legislation, regulations, and good intentions do not in themselves solve the dilemma of rising accidents. They do, however, provide us with a legal, and we hope precise, framework to operate within. With our study, we hope not only to define the industrial accident and the role of the chief participants, but to be able in some measure to anticipate the future and legislate, not only for this period, but in anticipation of the developments of the new industrial climate. I might say that we, as every prevention body is, are working towards the day when we can no longer be employed. We are assured by many economic planners that the advent of sophisticated technology (automation, if you will), will relegate the industrial workers to pushing buttons and performing monitoring functions for three hours a day.

Our chief aim at the moment is to keep workers alive and kicking until that day arrives. However, I might note that since less than two per cent of our industry is fully automated, I feel no immediate need for a job re-training course.

DISCUSSION PERIOD — WHAT'S BUGGING YOU?

Delegates who attended the labor sessions were asked to submit written questions concerning safety problems within their areas of operation, or questions that were generated by the safety sessions that they attended during the Congress week. These written questions were reviewed and answered by a panel of safety experts.

Presiding Officer: John R. Kimpel, Safety and Compensation Representative, United Rubber Workers, Akron, Ohio.

Moderator: Jacob Gold, Safety Engineer, Bureau of Labor Standards, U.S. Department of Labor, Washington, D. C.

Our department has continual exchanges of ideas, statistics and operation descriptions with our other provinces and other countries. We have just recently completed the first of two ministers' safety conferences where representatives of trade unions management, and government have come together to re-examine ideas generated by individual research. We have, as well, been host and key participant at the recent International Labor Organization Management Conference, which discussed in some detail the international aspects of safety education and preventive techniques.

All of us then—government, management, and employees—share the responsibility for industrial safety. As government becomes more adept at defining it legislatively and management more adept in recognizing it as a method of enhancing the balance sheet and employees learn to use the safety mechanisms provided for their own protection, we may yet find formulas that work better than our current situation-by-situation approach. Frankly, I cannot give you omniscient answers, but I know that if we, together, carefully select our questions and behave honestly and with proper concern in the area of our responsibilities, we will arrive at solutions that lessen and may eventually stop industrial accident and death.

Panel Members: Alan F. Burch, Director of Safety, International Union of Operating Engineers, Washington, D. C.; John L. Dowling, Director, Safety and Health Division, United Steel Workers of America (Canada), Toronto, Canada; Charles T. Greene, Director, Industrial Safety, District of Columbia Minimum Wage and Industrial Safety Board, Washington, D. C.; Floyd Van Allen, Ph.D., Deputy Director, Office of Occupational Safety, Bureau of Labor Standards, U.S. Department of Labor, Washington, D. C.; Victor E. White, Safety Director, International Brotherhood of Electrical Workers, Washington, D. C.

Moderator: Are penalties for violation of safety codes in the regulations actually sufficient to act as a deterrent to the violation of codes?

Mr. Greene: I would say no; they are not sufficient. The amount a company has to pay for a safety code violation is not enough to act as a deterrent. However, publicity is more of a deterrent than any fine that could be imposed. Of course, the only way to have adequate publicity is to impose a fine that is out of the ordinary.

We had a contractor that was fined \$300 for a violation, which was the maximum fine that could be imposed. Later, the contractor indicated that the fine was nothing compared to the adverse publicity from the newspapers, and that he would have much rather paid a \$3,000 fine than experience the publicity.

Moderator: In the province of Ontario, where the circumstances constitute an offense against the Industrial Safety Act and this offense occurs consistently, every person or employer who fails to comply with the provisions of the regulation, or the directions of an inspector, or the conditions of an approval permit is subject to a fine of not more than \$1,000 for each day of the violation or to imprisonment for not more than 12 months for each day of infraction.

Dr. Van Allen: In school I was taught that it is not the nature of the penalty but the certainty that the penalty will be imposed that encourages compliance. Our main problem in this country is not the penalty but the fact that most of the people who are violating regulations will not be penalized regardless of what the law says. This is probably because we do not have enough inspectors to cover the areas.

Moderator: There are far too many accidents involving high voltages which cause burns, electrocutions, and falls from high places. These accidents occur to electricians, linemen, and other craftsmen above the age of 60 who do hazardous work. Few of these old timers will admit the weakening of their grip, failing eyesight, weak heart conditions, or a tendency to experience dizziness. I don't believe that a compulsory medical examination is the answer, but there must be some solution. Perhaps workers over 60 should be prohibited from working in high

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Labor Sessions

Mr. White: I am 60 years old and not really the criterion. We in the International Brotherhood of Electrical Workers have many examples of men 25 to 30 years of age who have a heart condition, are epileptic, or suffer some other problem. It is true that some of the IBEW locals have agreements with the contracted company which require a man of 50 and over who shows evidence of gaining weight or suffering from some health problem be transferred to a less hazardous job. On the matter of physical examinations, the men within the local union can schedule periodic examinations with their own personal physicians.

Mr. Burch: I am opposed to pre-employment physical examinations as a condition of employment, but I am not against physical examinations. I think the point in this question is an important one and that is that we must be our brother's keeper. Most unions have negotiated health and welfare plans, and these should include at least annual physical examinations. Of course, there is nothing stopping an individual from seeing his own personal doctor periodically; in fact he will probably discuss his job more freely and the type of work that he performs with his doctor. After the personal doctor advises the individual about his physical ability in relation to performing his job, it is up to the worker to decide whether he will continue or not. In other words, we should inform ourselves about our own physical condition and how it applies to our job.

Mr. Greene: In this case, there is a question of one person being a hazard to other persons on the job. I know of two or three instances where physical condition of a worker caused injuries to others. In another instance, a chronic drunk was directly responsible for the severe injury of three other persons. Both management and labor know of this man's illness, but neither related it to his responsible job. I am in agreement that compulsory examinations are not the answer, but there is a joint labor management responsibility to get together and decide when a person may be a hazard to other workers because of his health.

Moderator: Do you think that unions and management should work together in writing or changing a safety rule?

Mr. Whitehouse: For years I have been preaching for joint labor-management safety committees to do this very thing. They should sit down and work out the procedures that are to be followed so that it becomes the responsibility of both labor and management to see that they are enforced.

In the past two years the IBEW and various managements have established over 800 joint labor-management safety committees. I am very strongly in favor of these committees establishing ground rules. This is a definite advantage for management. We have had cases in some of our locals where the union member was brought before the executive board and informed that the union agreed to these rules and regulations and he, as a member of the union, must comply.

Mr. Dowling: We deal with the Ontario Federation of Labor and favor its support of joint labor-management methods of rule and regulation writing, but I would like to add that once these rules and regulations are adopted they should be put into the working man's language. They should be developed in such a way that the working man knows what they are and he understands them clearly. In Canada, we print these rules and regulations in French for our French workers. The union also has an obligation to see that these rules are explained.

Moderator: A number of years ago Republic Steel Corporation wanted to communicate to all of its employees a better understanding of the economic problems of the company and how they affect the workers. They went to Brookings Institute for advice, then developed a play with 13 characters such as a farmer, business man, stock holder, manager, etc. The employees were assigned various parts and participated in the play at various locations all over the country. The principle idea was that participation would improve understanding and respect.

The company paid thousands of dollars for that idea, and it is believed that the same results can be obtained if the union is allowed to participate in developing safety rules. An example of such cooperation is the Calhounman Company's joint safety work with the Oil, Chemical, and Atomic Workers Union. This relationship is work-

ing extremely well and practically every one that I know of has worked very successfully. *Moderator:* Do you think safety programs should be in the labor contract?

Dr. Van Atta: Certainly! A contract has to do with conditions of employment, and one of the major conditions of employment is your continued life. It seems to me that labor groups, in general, have been most remiss in that conditions of employment have not been included under safety. However, this is certainly no excuse for this to continue.

Mr. Greene: The contractors in the District of Columbia must comply with the regulations of our department. One of the problems with safety by reference is that most of the workers, and some of the management, do not have any idea of what these regulations are. They don't understand them. If safety is in the contract, the workers ought to have enough information so that they can know whether the regulations are being complied with or not. If they are not, the workers can act accordingly.

If their wages under the contract were not being paid, they would do something about it immediately. I believe that a union should act immediately if there is a hazardous situation that needs correcting in accordance with accepted codes and regulations. However, if people do not understand the regulations they do not know when the regulations are violated. The answer, of course, is training. Without training, the regulations will be unimplemented.

Dr. Van Atta: I have read a significant amount of contracts which were signed by people who thought they had negotiated safety into the contract. The standard phrase is "the company will continue to provide safe and healthful places in which to work." This is really just saying that the company will continue its existing bad practices. That is not negotiating safety. It is as worthless as a contract that says the company will continue to pay wages.

There is meaningful language which can be negotiated into union contracts and nearly all of the international unions can provide this type of language.

Mr. Birch: If the union has already sat down with management and worked out acceptable safety rules, the contract contains meaningful language that is applicable

For example, "both sides agree to act jointly at all times, to the safety rules agreed jointly." This keeps unnecessary words out of the contract and has the advantage that everybody knows what is being referred to. It also skirts the situation where the contract is filled with language aimed at everybody's particular grievance. The important thing is to get together and work out the rules and regulations by which you are going to live and then firm them up in a binding agreement so that everybody knows where they stand.

Actually the original question — should safety be negotiated into a union contract? — has been answered by the National Labor Relations Board. Not too long ago, there was a decision which was upheld after it was appealed, and it will probably be a landmark case in labor relations. The final ruling was that safety was a mandatory subject of collective bargaining.

Moderator: To what extent is voltage over 5,000 volts being worked on out of aerial baskets or insulated platforms with rubber gloves and sleeves?

Mr. Whitehouse: I would like to highlight two things. One, safety standards for the electrical industry recommend that any voltage over 5,000 be either de-energized, or grounded, or worked by hot stick. Two, aerial baskets are fundamentally a good tool because they place a man in a good position. However, these baskets should not be considered as an insulating or isolating device. The same rules apply when working voltages from a basket as when working from a pole. There has been a concerted effort on the part of management of many utility companies to go to 13,200 volts (and one wants to go up to 15,000 volts as a limit. A man can use rubber insulation for up to 20,000 volts; however, if his nose is still exposed, that is where he will make contact.

Edison Electric Institute made an analysis of accidents over the years and practically all of the contacts over 5,000 volts are not hand contacts. So, the rubber gloves are not enough, and it's not reasonable to expect a man to work completely enclosed in rubber. In the opinion of our organization, 5,000 volts is the limit for working energized lines except via hot stick.

Moderator: A major Chicago cab company has vehicles which have the fresh air

exhaust funnels of the exhaust funnels of the passenger compartment of the cab. This could constitute a serious health hazard and we are wondering what the National Safety Council can do about this situation.

Dr. Van Atta: Actually the Council cannot do anything about this sort of condition except publicize the hazard. It surprised me when I found that this cab company is still taking their fresh air into the passenger compartment through ducts that are located down low in back of the radiator. This is especially surprising when you realize that all other automobile manufacturers stopped this practice 6 or 7 years ago because of the number of deaths from carbon monoxide. I can't think of any conceivable excuse for this type of neglect in design which can cause serious injury. I would think that unfavorable publicity and perhaps one or two damage suits against the company for negligent design might have a most salutary effect. These steps can be taken by the union and should be.

(Comment from the floor, by Joseph L. Algran, Safety Director, Seafarers International Union) — The local union that is involved with this cab company is meeting tonight and I will be present. I will recommend that this union take direct action to see that the condition is eliminated.

Moderator: How are safety and health problems handled under Canadian laws?

Mr. Dowling: We have an arrangement with the Director and Chief Inspector, Industrial Safety Branch, Ontario Department of Labour, Toronto, whereby I meet in his office to discuss any problem that involves steel workers. If there is a violation of the Industrial Safety Act, the initial step rests with the official of the local union involved. The local should extend every effort to get the violation corrected. However, if no corrective measures are taken the report is sent to my office. I forward it to the Industrial Safety Branch, and an inspector is sent to the plant to check into the condition. Subsequently, we get a report from the Director of the Industrial Safety Branch indicating whether the complaint was upheld or rejected.

The family of our union has a somewhat more involved history. The government inspectors or families

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Mr. Sessions

must contact the local union officials before he visits a plant and must take the local's appointed representative with him during his tour of the plant.

In addition, the factory inspectors in the Province of Ontario carry a warrant with them and, if they are opposed by the employer, the inspector uses the telephone to call the local magistrate. A policeman is dispatched to the plant to serve the warrant on the person obstructing the inspection and has the person removed from the premises until the inspection is completed.

Moderator: Is there a standard clearing house that records a complete list of radiation exposures to workers handling radioactive materials?

Dr. Van Alst: Not in the United States, unfortunately. There was a bill introduced in the last Congress, but Congress did not act on it. We have high hopes that it will be handled during the next Congress, although we understand that there is considerable opposition to this bill from management sources.

Moderator: How can we get management to correct unsafe conditions promptly?

Mr. Doeding: I can only give you an illustration of what happened in the city of Hamilton, Ontario. I was conducting seminars in Hamilton when one of the crane operators in the plant called me at my home. He informed me that the wheels on the crane had become so worn that the electric shoes that pick up the electricity had dropped to where they were striking steel bolts, causing them to fall to the floor below. I called the shop foreman and he admitted that the condition was unsafe.

I then phoned the Director of the Ontario Industrial Safety Branch and he sent an inspector within 35 minutes. The inspector was in the plant for 10 minutes. He shut down the entire plant. Management was then obligated to bring in a contractor to replace the crane wheels. The plant was shut down for two shifts.

Mr. Greene: We have a way of getting things done also; however, it is sometimes rather late. When we receive a complaint we send an inspector to the location. Usually an action existed for some time before we the complaint. It has bothered the act, and he has probably complained

to various people but he doesn't contact us until the condition gets serious.

Mr. Gold: I think it must be apparent that the answer to this question depends in a large measure on the geographic area in which the plant is located. Some states have fine laws which will take care of these things if you push them. However, other states are quite lax and backward.

Mr. Kumpel: If you believe you are working in a hazardous situation and feel morally certain that you are right in your belief, then you should refuse to work on such operations until they can be examined by proper and qualified authorities to determine if the conditions need correcting.

Mr. Birch: I endorse what John says, but I would like to add that union strength varies geographically. A lot will depend upon the knowledge and guts of the local business agents.

Moderator: What are the effects of asbestos dust?

Dr. Van Alst: Breathing excessive amounts of asbestos dust over a period of 25 to 35 years, depending upon the amount and the person, will result in shortness of breath, circulatory and heart problems, and the person will probably die of heart failure. In addition, you will probably get no assistance from workers' compensation. That is the classical picture of asbestosis. But, in the last few years, we are discovering that asbestos is a rather prolific producer of a variety of cancers of the lung and surrounding tissues. Asbestos is a shiny little crystal, like a needle, and it works into the tissues and promotes cancers.

One variety is appearing in rather substantial numbers among asbestos workers—it has always been there, but now it is beginning to be diagnosed. This is a subject about which we don't know nearly as much as we thought we did 20 years ago. I might say that excessive amounts of asbestos dust is only enough to constitute a slight haze in the air. The situations in which asbestos is used are highly deserving of competent professional assessment.

Moderator: How can unions get such professional assessment in cases where the plant hygienist or medical personnel are not competent?

Dr. Van Alst: There are several qualified physicians in the country who act as consultants. Also, some state health departments have personnel who can monitor asbestos operations and render opinions. (Comment from the floor)—Dr. Van Alst, you mentioned you can't get compensation for asbestos disabilities in most jurisdictions. The law has changed in most jurisdictions in the country during the last few years so that you may be able to sue the construction company, the architects, and engineers who built the plant without proper ventilation. This can be considered for full recovery for the wrongful death of a worker or for injuries. This is a very important new area of protection for workers, not only to get damages where there has been disability but to prevent the continuation of the condition in the future.

Moderator: What services or aid should be given or offered to local unions from the safety staff of an international union?

Mr. Birch: The safety director should develop training programs, or at least outlines, for use by local union safety personnel. He should supply materials (posters, decals, technical data, etc.) and act as a research consultant in safety and health matters. He should answer questions received via letter or telephone. He should gather statistics, which requires the cooperation of local unions.

The international union safety director should represent his union members and the trade union movement as a whole, on the various committees that write standards and codes which will effect the work of the union's members. The United States of America Standards Institute, the Society of Automotive Engineers, and the Society of Mechanical Engineers are examples of organizations that have these types of committees.

Previously, participation by union representatives has been minimal and we are doing our best to change this situation. This is one of the most important activities that safety personnel of international labor organizations can undertake. There are plenty of openings but labor hasn't sought representation. When labor does become a part of these committees, it has been my experience that labor representatives are welcome and offer valuable contributions.

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Author Session

Many of us have to find really important role in the organization. When safety department and that is top management support. This is very important; however, it is also essential that the man on the job support the safety activities. Too many local unions still offer only lip service to accident prevention. Until local union leadership pushes accident prevention, the man on the job will continue to be unconcerned.

Mr. Whitbourne: Let us not overlook the fact that many international labor organizations do not have a safety director or safety department. For them, the first thing they can do is establish such a department and staff.

(Comment from the floor, by Joseph Leonard)—The Longshoremen's union installed accident prevention activities in the International Union office and made it mandatory that each local should have a safety program. That was four years ago. To this day, I have to carry a bat when I visit the various locals in order to get these fellows moving. I do not believe that the International Union office can do much until the local unions are willing to accept it and support it. In addition, the rank and file members must provide support to their local union officers.

Mr. Kumpel: Our International Union has conducted many safety and compensation clinics throughout the United States and Canada over the past 23 years. We have fairly good success in attracting local union people to attend these clinics for three or four days at a time.

Moderator: Does the District of Columbia have the right to make its own safety codes through its appointed commissioners, or are the safety rules of the District enacted by the Congress of the United States?

Mr. Greene: The District, through its Minimum Wage and Industrial Safety Board, has the right to make safety codes. They handle all of the investigations and conduct the hearings necessary to develop these codes. This privilege comes from Congressional legislation.

Moderator: How do we sell safety to our union members?

Mr. Gold: I believe that you must establish, within your union, a desire. You have to give them a desire to participate in the problems. Let them participate with the and training and community. The

worker must understand how accident prevention will benefit him, personally. You cannot sell just once in a while. Ads for new automobiles do not occur once in a while. They are published continuously. The same continuing sales pitch is necessary to keep a union safety program rolling. You have to work at it."

(Comment from Bob Wilkins)—I feel certain that the only way accident prevention can be effectively sold to union members and their families is through effective demonstrations. Demonstrative presentations stick in a person's mind much longer and are more effective in changing habits and attitudes. Films are one method of demonstrating what can be done to avoid accidents or reduce hazards. Of course, this requires more time in preparing safety presentations and oftentimes costs money.

I am sure that all of you will agree that Jake Gidd does an outstanding job of teaching accident prevention to people from all walks of life and you will notice that he uses demonstrations wherever possible.

With reference to the continuing complaint that management cannot get the cooperation of the union or the men when they wish to initiate a certain type of accident prevention program, the primary reason for this difficulty is the fact that management feels that the safety program is not only their responsibility, but that it is their privilege to develop and enforce it as they see fit. These types of procedures often run into difficulty because most people resist something that is forced upon them. However, most people are willing to cooperate with practically any project or program if they have some voice in the manner in which the project or program is developed.

As an example, if management wants to initiate a safety-spectacle program, it is extremely helpful if they will ask the union to appoint two or three representatives to sit with management and develop the program which will later become mandatory. When this cooperation is enjoyed from beginning to end, the program will always be a success because both parties feel that the program was developed properly, and all parties will cooperatively assist in seeing it that the program is put into effect. Regarding the question of what labor can

do about industrial hygiene problems, I believe that if the state labor department or other concerned organizations cannot provide industrial hygiene personnel to study situations believed to be hazardous by the union, then the union should have the opportunity to hire its own consulting industrial hygienist to study the situation and give an unbiased report. This should satisfy the desires of the union membership and should assist in avoiding hazardous situations which may be overlooked by management.

(Comment from the floor by Mr. Philo)—If you don't mind, I would like to say something in general about a problem we, as lawyers, have in representing injured people. I have been interested in one very important area of safety and I refer to suits against manufacturers of machinery or safety equipment that result in an injury to a worker. Our position is not aided by the existence of weak standards and weak positions by local and international unions. In particular, I have during the past year presented cases of 37 workers who have lost hands in power presses. I have just spent some time in the Power Press and Forging Section sessions, listening to speakers on points of operation guarding. It is my opinion that about 50,000 presses in the United States are guarded by a trap instead of a safety device. These are the pull-back guards. I think it is preferable that a worker who operates a press equipped with these pull-back devices for 30 years is bound to lose a hand. I represent some clients who have lost both hands.

I don't believe that the National Safety Council is ever going to suggest that the pull-back devices are unsafe. This is probably because the Power Press and Forging Section basically represents industry and management. However, the unions can and should do something about this situation. They ought to get these devices banned in every state in the country. The pull-back devices violate the two principles of power press safety. First, every device or guard must have a fail safe mechanism; second, the worker's hands should never be placed between the dies when the machine is running.

General Motors, Ford, and Chrysler will not use these pull-back devices on their thousands of presses. They re-

they are a trap. It is the smaller shops which do not have effective accident prevention engineering in the plant, where these devices exist.

I recently talked to a corporate safety director who I thought, should know better. However, his company is being advertised as having pull-back type guards on power presses in several of its plants. The corporate safety director admitted this was true. He went on to say that this type of device was used in some plants because the local union insisted on the pull-back devices.

I believe that the local union safety personnel were undoubtedly good, conscientious safety people but were not safety sophisticated. This point of operation guarding is a complex problem.

Dr. Van Alst: What Mr. Philo says is perfectly true. Fail safe design is particularly important when you're talking about power presses. It is true that there is no failure of a pull-back device which is a

safe failure. Every conceivable failure is a hazardous failure.

(Comment from the floor)—I disagree with the idea of including industrial hygiene services in a union contract. I am with the State Labor Department of Iowa and am director of the industrial inspectors. We have one of the finest industrial hygiene laboratories in the United States. What we really need is support from the unions at the state level when it comes to budget time. The State Bureau of Labor doesn't receive the support from the unions when it comes time for requesting monies to provide adequate factory inspection and industrial hygiene survey work. The Manufacturers Association are there and they lobby against our budget continuously. Our Safety Commission is currently operating on a budget of \$16,000. We asked for \$30,000. The point is that the state has the facilities in adequate equipment and laboratories. But we need more support from labor.

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ignore them or avoid them. After all, we're young; to be hitting them into our pants for as long as you and I will be around.

Let's recognize that these are an exceptional group of youngsters. They're better educated than we are, starting to school earlier, and continuing longer. In fact, they're better educated than any generation in history. If you doubt that, try to help one of them with his homework. These young people are intelligent. They are incredibly powerful, because half the population of the United States is now under 25 years of age.

What they do not have that we have is the experience of having lived for a long period of time. They may weigh too lightly the rules for safe plant behavior that we have developed through long and painful experience.

Seems to me this leads us directly back to Accident Prevention Fundamentals—

systematically analyzing the man and the job, then thoroughly and carefully training, instructing, and observing.

Initial safety orientation, initial job instruction, regular planned safety observations with correction as needed, are all a part of this program to help the supervisor help the employee understand just what good job performance is, which in turn is good safety performance.

Is this an easy task?—definitely not. Is it time consuming?—definitely yes. If we're going to get the job done, the time must be spent. For only by this thoroughness can we really help them become safe employees, and they are vital to us.

We must pay this attention to these young men and women—for in a breathtakingly short time, they will be sitting here where you and I sit today.

Safety's future—indeed our future is like wise their future. Let's make the most of it.

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be regularly inspected for signs of damage or deterioration. If respiratory equipment assigned to employees is not functioning properly, it should be taken out of service and repaired. When it is necessary to go into pipelines or confined spaces where ventilation might be suspect, the best safeguard is the use of electric or gasoline driven blowers which can move considerable volumes of fresh air into such work locations.

Important adjuncts to respiratory equipment are two widely used pieces of air-testing equipment, whereby we can determine the presence of explosive gases. The sniffer, or explosive gas indicator, samples a portion of the air through a metal extension tube and hose. The presence of explosive gases will be indicated on the instrument's easily read dial. This is all done without having to expose the worker to any hazard, because conditions can be determined before entering a suspected area.

When working in pipelines or tunnels, the *Hot Safety Lamp* is often used as an indication of atmospheric conditions, and, in some states, it is required that one of these be carried along with the work. They were originally developed for use in coal mines. The indicator in this case is a small flame, which is surrounded by a graduated scale on the lamp chimney. Variations in the flame indicate conditions of the air. If the flame grows larger, it indicates the presence of explosive gases; a decreasing flame indicates a deficiency of oxygen. Consequently, we must always remember that gas from a broken main or other source may seep into vaults or other underground structures within a short period of time, and by displacing the oxygen, can cause asphyxiation.

For work area protection, any employee assigned the duties of flagman should wear a red vest, and carry a red flag and a hand paddle which will clearly show his intentions when directing or controlling traffic. Waving a red flag to indicate directional instructions only serves to confuse the motorist, and can set the stage for a serious accident.

Another available piece of protective equipment is the first aid kit. Its function is to prevent a minor injury from becoming a serious one.

The kit should be kept clean and

in good condition, and stored where the supplies won't become damp or deteriorated. Most 10 and 21 unit kits hold the same relative variety of supplies, but the larger kits will store extra units to serve large groups of employees. On large construction jobs, first aid kits should be supplemented by a stretcher, blankets, and splints. This type of equipment, like insurance, is far better to have and not need, than to need and not have, in the event of a serious accident.

Many of our operations such as welding, lead, welding or heating cannot require fire extinguishers on the job. Fire extinguishers are designed and classed to combat fires in the following categories: Class A fires, which involve combustibles such as wood, trash, rubbish or brush; Class B fires which involve flammable liquids; and Class C fires, which occur in energized electrical equipment. Fire extinguishers should be selected only after consulting with your local Fire Department on the most efficient type. It is the kind of fire most likely to be encountered. You can also get good advice from your local Fire Department on the selection of fire extinguishers for your home, trailer or boat.

We have discussed only a few of the many different types of equipment designed by experts to enable an employee to work safely, and return to his family in good condition at the end of the day. Let's take one last piece of protective equipment that offers protection from the greatest number of serious injuries and fatalities that we may encounter either on the job or at home. We're speaking here of traffic accidents, and a buckled-up seat belt is one of the best ways to protect drivers and passengers from serious injury or death. It is estimated that seat belts could save more than 300 lives annually, if every driver used them.

You can readily see the scope of protection that is offered to employees working both on and off the job. This equipment is totally worthless unless it is used as intended. Probably in no other area of safety can such dramatic injury reduction be achieved than through the proper use of good equipment designed to protect against the final possibility, the best safety device of all is a seat belt.

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CALCULATION CHART

Pre-Event	Site-Event	Activity	Opt. Guess	Most Likely	Press. Guess	Avg. Time (T)
1	3	Load rail and tools in truck and get line-up	20	25	30	25
3	5	Drive to job site	40	45	60	47
5	7	Flag east and west	30	40	50	40
5	9	Prepare to change rail	20	25	30	25
		(a) Unload rail and tools				
		(b) Send out flags				
		(c) Remove two bolts from angle bars				
		(d) Pull alternate inside spikes				
		(e) Spot up rail				
		(f) Waiting for truck to return				
9	11	Change rail	15	20	25	20
		(a) Take off bars and pull spikes				
		(b) Set out broken rail and load on truck				
		(c) Set in good rail and send truck after flags				
		(d) Put on angle bars				
		(e) Change and drive spikes				
		(f) Wait for truck				
11	13	Prepare to return to headquarters	15	20	25	20
		(a) Pick up scrap and tools				
11	15	Pick up flags	30	30	50	40
13	17	Drive to headquarters	40	45	60	47
17	19	Unload broken rail	5	10	15	10

What are we trying to do with PERT? We are trying to motivate our key people to program themselves and their men to work safely and efficiently.

The reward for learning is confidence. We must continue to learn and to teach and we must not forget our people if we are to prevent accidents.

We can summarize as follows:

1. We created an atmosphere of communications.
2. We accepted the philosophy of safety—"Accidents Can Be Prevented."
3. We recognized and accepted our responsibility in our organization.
4. We were motivated by accurately answering the question, "What do I get out of safety?"
5. We created good personal relations through personal contact.
6. We reviewed work fundamentals by applying the job hazard analysis system.

7. We improved work methods through work simplification techniques.

8. We provided a method of programming ourselves and our resources for safe and efficient work through PERT.

This program has provided us with a personal discipline. It has given us the confidence and ability to successfully meet the challenge of the future.

We are learning how to work safely by applying modern management techniques to our work problems. We know these tools can be effective when applied to specific problems and presented at the proper level of comprehension of the particular people involved because the Dallas Division maintenance people worked 584 days without a disabling injury, with no disabling injuries in 1965. We have had one disabling injury in the Bridge and Building Department this year.

We can successfully meet the challenge of the future by continuing learning and teaching and finding ways to improve management tools.

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