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VOLUME 1 OF THE TRANSACTIONS
55th NATIONAL SAFETY CONGRESS
(October 23-26, 1967, Chicago)
Papers Delivered in the
GENERAL SESSIONS
(With List of Exhibitors and General Index)

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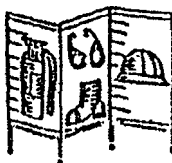
ANNUAL COUNCIL MEETING

Invocation	<i>Rabbi Mordecai Simon</i>
Minutes of the Annual Council Meeting	<i>R. L. Foner</i>
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Address	<i>Keaton Vandeman</i>
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NATIONAL SAFETY CONGRESS BANQUET

Invocation	<i>Dr. W. Henry Shillington</i>
National Safety Congress Banquet	
Exhibitors—55th National Safety Congress & Exposition	
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PLAN
NOW TO
ATTEND
THE



1968

NATIONAL SAFETY CONGRESS

OCTOBER 28-31, 1968 / CONRAD HILTON HOTEL, CHICAGO

1969

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

1970

At the '68 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.

This four-day educational program, planned and presented by the National Safety Council, can be your most thought-provoking, most worthwhile safety experience in 1968.

Make plans early to attend the 1968 Congress and bring the other people in your organization who have safety responsibilities.

FUTURE CONGRESS DATES	
1968	October 28-31
1969	October 27-30
1970	October 26-29
1971	October 25-28
1972	October 23-26

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Executive Director of the Chicago Board of Rabbis

Almighty and Eternal God:

Inspired by your ethical and moral teachings, we have come together to reflect upon our progress to this time and to consider the tasks still before us.

As citizens of a nation dedicated to the Fatherhood of God and the brotherhood of man, we are charged to do justly, love mercy and to walk humbly with You; to extend compassion, understanding and aid to the perplexed and sorely-tried; to love our neighbor as ourselves.

To these humanitarian heights has the National Safety Council dedicated itself through its noble aims and purposes of constantly working, studying and planning for means that will result in the extended health, welfare and education for all.

To these noble ideals, we pray, may we ever remain faithful, as we develop a continuing sense of dedicated commitment to this organization, our respective professions and those we serve, a commitment which both elevates and ennobles.

We beseech Your blessings upon all who have affiliated themselves in the attainment of these common objectives. Endow them with the knowledge, wisdom and guidance necessary for fruitful leadership and success in the attainment of these goals . . . Inspire us to labor zealously and unflinchingly for the perpetuation of the American way of life.

Guard our country from iniquitous designs, intolerance and blind prejudice. Keep our borders free from every enemy, both from within and without . . . Grant us clear minds so that we may approach the problems of our day with forthrightness and unselfishness . . . Spread Your tabernacle of peace over all the nations of the earth.

May the work of peace be righteousness, and its effect, freedom from fear and want for all men. Amen

minimum injury to employees; to promote maximum efficiency; and to effect savings by preventing injury and by reducing interruptions caused by occupational accidents."

The objective was followed by an outline of methods of obtaining the objective: "The effectiveness of the Accident Prevention Plan will depend upon the participation and cooperation of supervisors and employees of all contractors and sub-contractors engaged on this project, and the coordination of their efforts in carrying out the following basic procedures:

1. Planning all work to protect against personal injury, property damage, and loss of productive time.

2. Maintaining a system of prompt detection and correction of unsafe practices and conditions.

3. Making available and enforcing the use of personal protective equipment and mechanical guards.

4. Establishing an effective system of tool and equipment inspection and maintenance.

5. Establishing an educational program to insure the interest and cooperation of all employees through:

A. Personal example and safety contacts.

B. Instruction in safety requirements and insistence on compliance with such requirements.

C. Safety meetings.

D. Effective use of bulletins, posters, or other safety literature.

E. Investigation of all accidents to determine their cause and promptly taking the corrective action to prevent their recurrence.

6. Each contractor's and sub-contractor's principal supervisors shall obtain a copy of and shall comply with the Indiana Safety Code for the Construction Industry, and rules and regulations applicable to the work performed by each employer on this project."

Following the outline of six methods to gain the objectives, the responsibilities of the chief project engineer; the safety coordinator; the contractors and sub-contractors; and the job foremen are outlined.

The chief project engineer is responsible for the entire plan as I have outlined it to this point and, in addition, must appoint a safety coordinator, authorizing him to enforce safety measures and to recommend corrective action when sub-standard practices and conditions are observed.

The responsibility of the safety coordinator is to follow all phases of the plan as they have been outlined and in addition maintain adequate records.

The responsibilities of the contractor and sub-contractor are:

1. Comply with all provisions of the Accident Prevention Plan, including attendance at and participation in safety meetings.

2. Appoint a qualified representative with full authority to act on all matters relating to the Accident Prevention Plan.

3. Plan work to protect against personal injury, property damage, and loss of productive time.

4. Cooperate with the project safety coordinator.

5. Comply with the requirements of the Indiana State Code and all other codes relating to his operations.

6. Provide to employees and visitors all personal protective equipment required by the exposure and enforce the use of such equipment.

7. Insure that prompt first aid is administered to an injured employee and transport him to the project clinic or as otherwise directed by the clinic.

8. Comply with all required accident reporting procedures.

The outline of the job foreman's responsibilities include:

1. Setting a good example for the men.

2. Instructing in safe work practices and work methods.

3. Use of proper protective equipment and proper tools.

4. Checking for unsafe conditions and practices.

5. Completely investigating accidents to determine causes and taking all necessary corrective action.

6. Promptly completing required Accident Reports.

7. Holding meetings with men.

The Burns Harbor construction supervision and safety personnel are continually in the construction areas and insist on strict compliance with the Accident Prevention Plan and the "General Safety Rules for Contractors". The fact that the Bethlehem Steel Corporation provides workmen's compensation and general liability insurance to cover approved contractors on the project greatly enhances enforcement of the safety program by Bethlehem and compliance with the program by the contractors.

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Weekly safety meetings are held by the craft union stewards, and committees from these meetings are assigned to work with plant protection and safety personnel of the Burns Harbors to further assist in the compliance by all contractors toward the desired goal of maximum safe working conditions.

Periodically, the business agents for the unions make safety tours of the construction areas with members of the construction and safety departments pointing out various constructive improvements to further improve the program.

Considerable time is spent working with the A.F.L. craft union safety representative to insure a mutual understanding that, for a safety program to be effective, requires the cooperation of both management and labor. Without the complete sincere support of the

unions toward a proper safety program, the program is not only "lip service" but safety is not being improved.

Compliance and cooperation on the part of the unions has been excellent. Only infrequently have actions, other than fines, been required to bring the safety program back into line. The aid of the purchasing department is enlisted when the most effective corrective actions have been necessary and the procedure has been most effective.

Our program is not unlike other programs in the construction industry, having the common denominator of planning, motivation, communication, and follow through accompanied with dedicated hard work on the part of each individual on the site. We attempt to implement our program with enthusiasm and a directness of purpose eliminating "lip service" and the attitude "we will look at the problem later".

OCCUPATIONAL HEALTH IN THE CONSTRUCTION INDUSTRY

By FRED OTTOBONI

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Occupational health in the construction industry is a subject that has not yet received any real interest or attention in the United States. Articles appear from time to time in the American literature on a specific health hazard, such as lung cancer in asbestos insulators, or lead poisoning in painters. Other than a few papers originating in California, where a start has been made on the heat, noise, and dust problems of heavy equipment operators, almost nothing seems to have been written on the present health status of the individual crafts or on the overall health problems or needs of the industry.

This lack of interest and work is significant. Either there are no problems in the industry worthy of mention, or there is an appalling lack of some vital ingredient which is necessary for stimulating the growth of a systematic interest in the health of more than four million American workers.

First, let's define "occupational health". The term has been so loosely used over the

last few years that intelligent discussion of the subject has been difficult. Some people interpret it to mean everything from a cold finger to the social well being of the craftsman's family. For our purposes here, however, occupational health means the prevention of work-caused disease and disability. It is control of the work environment, not the worker, where both labor and management have a clear responsibility for observation, discussion, and hazard control. This definition requires particular meaning when one realizes that the majority of occupational diseases are not curable; they are only preventable.

Five conclusions have emerged from our studies of occupational health problems in the construction industry. We feel they are fundamental, if progress is to be made. They are the result of nearly five years of observations in California. They dramatically reveal the lack of interest, the lack of programs and the lack of action that beset the industry. It is recognized that the immediate demand of

pressing safety problems in the industry may, in part, be responsible for submerging any concerted interest in health problems. While no attempt is made here to detract from the important responsibility for accident prevention in the industry, it is time that programs in work-induced disease prevention begin to receive the attention they deserve. High accident frequencies cannot, by any stretch of the imagination, justify a lack of interest in healthy working conditions.

Our first conclusion—there is a basic need to recognize that construction workers are now suffering job-induced diseases and that new diseases will emerge with advancing technology.

To the casual observer or even a member of the industry itself, it is reasonable to believe that occupationally-induced diseases in construction work are not a problem. The crafts have long histories of working outdoors in the fresh air with hammers, shovels, and other tools which have in the past traditionally presented safety problems, but not health problems.

A look at the Federal or State health statistics appear to support this concept: not because there is a lack of problems, but because neither the Federal government nor the states—with the possible exception of California—keep any statistics on the subject. When no disease is reported, it is natural to conclude that none exists. However, what appears as no problem is, in reality, no information on the problem.

Experience in California supports this conclusion. In recent years, physician's reports of occupational diseases among construction workers have been coming into the State Health Department at approximately twice the average rate for all California workers. Since 1940, when recording began in California, this rate has been continuously among the three highest of all the major industries. The diseases involve the skin, the lungs, systemic poisonings, hearing loss—essentially the whole range of illnesses normally believed to lie in the exclusive province of factory workers.

Field investigations suggest that more is to come. For example, an estimate based on hearing tests conducted at construction sites by fully-qualified audiologists indicates that some 20,000 heavy equipment operators now working in the state have permanent noise-induced hearing loss. The trend toward

larger, faster, and more powerful equipment designed without consideration for the long-term health of the operator, is expected to intensify this hearing loss problem. It also is expected to introduce silicosis for the first time as a disease of the operators of dozers, power shovels, and front-end loaders.

The equipment operator is not alone in facing these health hazards. The recent replacement of the plasterer's conventional trowel with a spray nozzle has introduced serious hearing loss problems insofar as the plaster guns that we have measured are concerned. Further, the gun application of asbestos-containing fireproof coatings continues without control and without concern. Yet data coming in regularly from studies of men working around asbestos dust leave very little doubt that the gun operator and other craftsmen in the area are being subjected to the risk of asbestosis and lung cancer.

There are many more examples. Plastic adhesive and surfacing materials have made life an itchy nightmare for the tile setter and the cement mason. It is important to realize that much of this skin disease is accompanied by a permanent allergy to the epoxy resin hardener used in the process. The slightest further exposure to the hardener brings on a repeat case of the itch and the man is permanently disabled for any further work with the plastic.

Another example involves today's welder. There was a time when very little except ordinary steel was found on a construction job. An unprotected welder could work with very little hazard from fumes. Alloys are changing this. For instance, inhalation of the fumes from manganese steel will produce an illness which closely resembles Parkinson's disease. Consider also that nickel, cadmium, vanadium, and some other metals are toxic by inhalation.

It is clear that the pick and shovel are gone, and along with them went the fresh air and the iron man. The construction industry has entered the era of machines and chemicals, and it should recognize this.

A second conclusion—it must be recognized that the methods which have been developed for the protection of the factory worker may not be feasible on a construction job.

Most of the occupational health literature and practically all of the preventive methods in use were developed with the factory

worker in mind. The factories, in the critical industrial health problems of the 19th and early 20th centuries, were where the interest, the resentment, and the money has been invested. The emphasis today, although comparatively small, is still on the factory. As a result, the standard control methods available in all the textbooks, ventilation, isolation, enclosure, substitution, and personal protection, are organized to make practical and economical sense in a factory setting.

The factory hand works for the most part in a fixed location. Exposure is repetitive and predictable over a long period of time. Utilities are available and control methods can be designed, tested, and finally built-in as part of the company's long-term capital investment. It is not unusual to see a \$20,000 ventilation system built into a plant to protect 10 or 15 welders.

But look at the welders on the construction job. In a lifetime, each will have done about as much work and generated as many fumes as a factory welder. However, the control system here is non-existent, because the control methods in the textbooks do not make practical or economic sense on a construction job.

Factory spray painting is done in a ventilated booth, according to the books. Since a booth would cost too much on a construction job, we scratch our heads and spray paint anyway.

Dust, noise, heat, and almost any health problem is controlled by cookbook methods in the factory. The cookbook doesn't work for construction, so we live with the problems and hope they will go away.

It is now critically necessary that we accept the fact that a construction job is not the same as a factory job, and that the factory hazard-control cookbook—although free—is not applicable.

A third conclusion—we must begin to develop our own occupational health standards.

The golden era of occupational health in the United States ended in the mid-1950's. The movement which began in the 1930's and provided wide knowledge of industrial diseases and excellent textbooks is slowly dying. The Federal program is small and without legal authority. State programs not only have been declining in manpower, but show little interest in the construction industry. The traditional standard-setting agency

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in the country, the American Conference of Governmental Industrial Hygienists, is dependent upon its dues-paying members for support. Its \$13,000 yearly total budget will not cover more than a fraction of the country's problems, and that fraction will be factory-oriented.

On this basis, it is unlikely that the widely subsidized work that went into helping the industrialist to understand his problems and to custom-tailor his environmental control will be available to the construction industry. The facts are that the responsibility for providing a reasonably healthy place to work lies directly with construction labor, and construction management.

The need for environmental standards is growing with each day. Noise offers a fine example: Heavy equipment, trucks, compressors, chain saws, jackhammers, and a wide variety of power hand tools are producing hearing loss that is reaching scandalous proportions. There are choices. The individual contractor can hire an acoustics expert and modify these tools at his own expense. As another choice, he can attempt to stuff earplugs in his men, a method that will be of no practical value on a construction job, and one that will probably reduce productivity. A popular alternative is to do nothing and let the insurance companies worry about it.

The sensible solution is to collectively write a set of performance standards for power equipment. These can be written right now, from knowledge at hand, and would specify maximum allowable noise intensities at an appropriate given distance from the equipment. The tool manufacturers may have difficulties at first. But their engineering and research departments are available and in the best position to control hearing loss at the lowest possible cost.

Adequate labelling also must be considered. Very few of the materials capable of causing eye, skin, or lung problems such as plastics, paints, welding rods, fluxes, solvents, lubricants, etc., have useful warning labels when they reach the construction site. This has two negative effects. In addition to the potential for injury. First, even the interested men cannot find out how to protect themselves. And second, if the material does cause a problem, the men have no clear information that might be useful in selecting a less harmful product for the next job.

This is particularly dramatized by the experience of the cement masons, whose labels are often so vague as to make it impossible for them to determine whether the surfacing material they are expected to apply on a particular job is a dermatitis-causing epoxy, a bronchospasm-causing urethane, or a relatively safe polyester.

The noise and label problems are straightforward. They follow the textbook closely. Others may not be so simple because of the mobile nature of construction work. Solutions to these will require imagination and money. Ideas from the space program are sure to be useful and we expect to see exploitation of the controlled individual environment in the form of air-supplied suits for plasterers, cement masons, and welders; and air-conditioned, noise-and dust-tight capsules for heavy equipment operators. Standards, once set, can make these easily accessible at mass-produced costs.

The logical approach is to accept the responsibility and begin to develop some standards that can be put into contracts and equipment purchase orders; otherwise the industry faces attrition of skilled manpower, higher compensation costs, hazard pay, and if the problem gets bad enough, the inevitable application of the ill-fitting industrial cookbook to these construction jobs.

A fourth conclusion—records and statistics must be kept.

I repeat, health information on working men is scarce. This is particularly so in the construction industry because even the information that is obvious in a factory is clouded by the nature of construction work.

A factory is a relatively permanent environment. Jobs acquire reputations: they smell; old timers get lung disease; this or that chemical will make you sick if you inhale it. This is epidemiology in its most primitive form, done without the help of the professionals or the government. Nevertheless, it is very effective in discovering diseases and developing control methods.

Contrast this with a construction job. The office is often a house trailer and a single craft is not likely to be on a given job for more than a year. Who now is going to do the epidemiology? Work-induced health damage, suffered by a craft during the course of a single project very easily passes without notice. It is not until a series of such projects—and years—have passed that disability is

marked enough to prevent further employment. At this point, cause-effect relationships are obscure. No single event can be held responsible, and the work force has a few less craftsmen. If by some chance the illness is recognized as work-induced, the last employer may be held responsible for the entire cost of compensation. This is no solution.

For example, earth mover operators have long suspected that somehow spinal problems are connected with their jobs. This may or may not be so; there are no statistics. It is hardly possible that all equipment operators are born with bad backs. It is most likely, however, that the vibration and bouncing on some types of seats on some types of equipment are causing spinal damage. Unless it is known, first, whether or not operators are truly suffering spinal problems and second, exactly which machines and what conditions are responsible for the problems, prevention of "back trouble" will be impossible.

With computers now available, it is feasible to record the pertinent details of every job, every illness, and every death for every man working in the construction industry. This should be done by every craft union, with the cost shared by the employer. Routine computer output will then tell us whether painters die young, or equipment operators get silicosis, or plasterers get emphysema, and whether the lung cancer that has been found in asbestos insulators is being controlled or not controlled.

A fifth conclusion—uniform, reasonable regulation must be insisted on.

Competition is very real in construction. In fact, it appears to be so fierce that it often is cited as the justification for poor health and bad safety practices. For instance, the question as to why water is not being used to control dust on a given haul road very often will bring the reply that this is highly commendable; however, "it was not included in the job estimate because the competition never includes such things, and in order to bid the job successfully it was necessary to dispense with the water wagons".

This is a standard answer for many problems. Its effect is to penalize the legitimate contractors and to make the natural growth of healthy working conditions next to impossible. This fanatic interest in cost-reduction seems to be eroding the few existing health standards accepted by the industry.

For example, everyone knows that a sandblaster should wear an air-supplied helmet.

This has been accepted without question for decades. Yet during the last year the writer has seen five construction jobs where sandblasters were working. They all religiously wore the proper helmets—but not one had an air-supply hose connected to the helmet! Apparently the air supply isn't being figured into the bids anymore, even though it is still in the law.

Diesel engines in underground construction are an example of long-term, legal erosion. Diesels were allowed underground only after long study and, finally, the setting of rigorous standards by the Bureau of Mines. These included specially designed engines, matching exhaust scrubbers, and ventilation rates based on numbers which accompanied the vehicle from the manufacturer. Competitive progress over the last 20 years has led to the erosion of standards and the acceptance of any diesel vehicle with a home-made scrubber, and ventilation rates based on air sampling methods that have not been proved reliable. The engineered and tested standards and safety factors prepared by the Bureau of Mines are being forgotten. Although a few contractors still use Bureau of Mines equipment, continuous pressure from the industry has eroded the minimum standard. One thing is certain: eroded standards, no

matter how legal, neither increase profits nor make diesel exhaust better to smell nor safer to inhale.

The competitive inducement to save money by shaving health and safety costs need not continue. Good applicable standards, as they are developed under our third conclusion noted above, can be made a part of all construction contracts and all labor management contracts. In this way, healthy working conditions will be officially recognized as a legitimate cost of doing business, and the toll will be paid in dollars by the buyer of services rather than in the health and longevity of the craftsmen who provide them.

The construction industry has a host of hidden and pressing occupational health problems, with more to come. For the short term future, government rescue does not seem possible and a serious and planned effort by management and labor is badly needed.

The construction industry has enjoyed and become addicted to the privileges of hard work and fresh air. Change is always difficult. But one way or another, like it or not, the technology that we are using to change the face of the earth will, in the long run, change us also.

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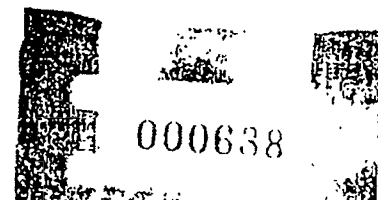
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*Deceased.



be brought into the picture here. It looks like the Department Superintendent, or Production Manager, or maybe even the Factory Manager, has not spelled out in clear and concise terms just what the Foreman's safety responsibility really is. You will recall that when John finally decided to shut the machine down he stated, "I'll probably get fired for this."

QUESTION: What about Foreman John's language? Is it just "shop talk?"

ANSWER: It may be, but it sure could convey the wrong impression to anyone working for him. I think he would command much more respect as a leader if he talked of and thought of his fellow workers with more respect.

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Electric we find the following three steps particularly fruitful:

1. Acquaint private physicians with nature of work, requirements of Benefit Plan, and function of company medical staff. This has been accomplished by various means, ranging from simple phone calls to plant visits to open houses for community doctors. We find a direct correlation between the amount of familiarity a patient's doctor has with the company and the length of illness absences.

2. Visitation of sick employees to discuss convalescent progress. This visitation may be done by supervision or nurses. In the past we have utilized visiting nurses, but we are having our nurses primarily visit by telephone now. It is still company policy to have supervision visit the employee to show continued interest in the employee while he is disabled.

3. Once a patient is ambulatory, he is asked to visit the company dispensary. The ability of the employee to return to his regular job or to "light duty" can then be discussed between company and private physicians.

Obviously, this kind of close attention to employee's health, and to the work and home environments that contribute to it, can best be accomplished by an on-premise medical force. A company as large as Western Electric finds the effort not only a humanitarian necessity, but one which pays off in on-the-job performance.

The scale of Western's commitment to employee health can be seen in these figures

—37 full-time and 99 part-time physicians; health and safety programs at 57 company locations; programs ranging from biomechanics to computerized epidemiological studies, and fundamental research in such varied fields as heart disease and laser hazards.

I appreciate that smaller companies cannot spread these costs across a large employee body. Many companies have found that private clinics can take on this vital medical-management partnership. Others depend on insurance benefit plans—a sure way to prolong absences. Many reports have indicated there is a tendency for length of absences to increase as benefits increase.

Sound management plan is essential to control absenteeism. It creates the psychological and physical environment conducive to good attendance. The cooperation of family and occupational physicians can do much to improve this attendance. This cooperation can restore the ill and injured to work as soon as possible and practice on a broad scale all that we mean by "preventive medicine." Management and medicine can make a contribution to the operating efficiency of the organization. But most important of all, a vigorous medical-management plan is a foundation upon which to build a healthy society on and off the job. As the pressures of our technological age increase, as our urban environment becomes more complex, it is imperative that we bring business and medicine together to seek mutual solutions to health and safety hazards.

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