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NATIONAL SAFETY CONGRESS TRANSACTIONS

CHEMICAL and FERTILIZER INDUSTRIES

NATIONAL SAFETY COUNCIL
425 N. MICHIGAN AVENUE
CHICAGO, ILLINOIS 60611

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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 effectual 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 participant in this worthwhile project for we are desirous of doing all that we can to fulfill the purposes 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.

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 Harbor, 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 1956. 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.

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 per cent 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 account of the circumstances of the two initial cases is to

be published soon by Dr. Hector P. Blejer 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 complication, investigations were instituted 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 between the purchasing agent and the health and 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 esesntially 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 particles per cubic foot of air is considered within safe limits.

This, however, is not the whole story in connection with talc and soapstone. Not infrequently, these two materials 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 this 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 ACGIH 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 cases, and it is felt that much of the hazard was removed when manufacturers or fluorescent lights agreed to omit beryllium in their phosphors in June 1949. This metal has many desirable properties and is finding increasing use in a diversity of operations. In all plants where high temperature resistance metals or ceramics may be used, the health 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 26 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 liquified petroleum gas with no carbon monoxide content. It is, of course, important always to keep in mind that imperfect combustion of natural gas or LPG 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 sudden death is hydrogen sulfide. The worst case of liberation of hydrogen sulfide in an occupied area occurred in Poza Rica, Mexico, where liberation of hydrogen sulfide at a gas and oil field caused 22 deaths and several hundred cases of sufficient severity to require hospitalization. Wherever hydrogen sulfide is being recovered from petroleum

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 causes 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 no evidence that a sufficient exposure occurs at chromium plating operations to produce this condition. Certain dye intermediates are sufficiently effective in the production of bladder tumors that the State of Pennsyl-

vania has passed a law, unprecedented in the United States, that two of these — beta-naphthylamine 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 continuous for five hours or more per day is contemplated.

The United States Air Force extends the range over which octaveband determinations are made from 300 to 4800 cycles per second. An octave-band level of 85 decibels is considered that at which damage risk is minimal 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 excessive 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 to be 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 related to the possibility of injury can there be a wholly successful program in avoiding both outright occupational diseases and also in provision of a workroom atmosphere conducive to the optimum well-being of the worker.

self and his fellows, who uses his 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.

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 Labour Organization Manpower 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.

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. Kumpel, 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.

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 Atta, Ph.D., Deputy Director, Office of Occupational Safety, Bureau of Labor Standards, U.S. Department of Labor, Washington, D. C.; Victor E. Whitehouse, Safety Director, International Brotherhood of Electrical Workers, Washington, D. C.

Moderator: Are penalties provided for violation of safety codes in the various jurisdictions 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 Atta: 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 places and assigned to other challenging work.

Mr. Whitehouse: A man 60 years old is 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 periodical 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 seeking 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 knew 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 book?

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 Carborundum Company's joint safety work with the Oil, Chemical, and Atomic Workers Union. This relationship is working 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. Burch: If the union has already sat down with management and worked out acceptable safety rules, the contract can contain meaningful language that is also simple.

For example, "both sides agree to adhere, at all times, to the safety rules agreed upon 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 intake so placed that the exhaust fumes of the car immediately ahead are taken into 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 rediator. 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 salubrious effect. These steps can be taken by the union and should be.

(Comment from the floor, by Joseph L. Algina, 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 foundry section of our union has a somewhat more refined method of liaison. The government inspector for foundries

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 Atta: 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. Dowling: 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 stud 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 the condition existed for some time before we receive the complaint. It has bothered the worker, 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. Burch: 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 Atta: 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 workmen's compensation, if you are under most jurisdictions. 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 skinny 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 they feel the plant hygienist or medical personnel are not competent?

Dr. Van Atta: There are several highly qualified physicians in the country who will act as consultants. Also, some state labor departments have personnel who can monitor asbestos operations and render opinions.

(Comment from the floor)—Dr. Van Atta, 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. Burch: 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.

Now we come to the really important role of the international union 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. Whitehouse: 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 it's own safety codes through it's appointed commissioners, or are the safety rules of the District enacted by the Congress of the United States?

Mr. Greene: The District, through it's 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 members, a desire. You have to give them a chance to participate in the problems. Let them assist with first aid training and community action. 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 persons 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 Gold 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 both parties will cooperatively assist in seeing to 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 it's 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 predictable 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 Forgings 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 any of their thousands of presses. They recognize

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 Atta: 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 conceiveable 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 $39,000. The point is that the state has the facilities in adequate equipment and laboratories. But we need more support from labor.