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59th NATIONAL SAFETY CONGRESS

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UTILIZING HUMAN FACTORS TO IMPROVE FOOD INDUSTRY LOSS CONTROL

By ROBERT E. HEGLUND
Asst. Div. Mgr., Loss Prevention Dept., Liberty Mutual Insurance Co., Pittsburgh, Pa.

One of the basic objectives of any individual within any organization is to assist that organization in achieving a profitable operation. Yet, profit does not just happen. It is the efficient utilization of machines, materials, and people. Of these three, people represent one of business' greatest assets. It is also one of the great contradictions today that while people do represent a great asset, they can also become one of the greatest liabilities due to the losses that they can produce in an organization.

The human losses that a business can suffer are many in number. Just a few would include absenteeism, illness, turnover, errors, theft, customer complaints, grievances and, last but not least, accidents and injuries. Many studies throughout the years have conclusively shown that of the two major factors involved in accidents, it is man that is the major problem. We can safely say that approximately 85 per cent of our accidents can be attributed directly to man, and only about 15 per cent to the pure exposure.

It has been stated that man plus a hazard produces an accident. However, I do not believe that this statement is totally true. In addition to the man and the hazard, there must be action to produce the accident. A man's action involves his behavior on the job, which is a direct reflection of the man's attitude. Therefore, it might be more appropriate to say that man plus his attitude will equal an accident.

Further studies show that approximately 85 per cent of all of our losses, including accidents, come from a small group of our people, approximately 12 per cent of the work force. While this 12 per cent may seem very small in number, it must be remembered that they are producing the majority of our losses. We can refer to these people as our "troubled workers."

We have long realized that the human factor is important as far as accidents are concerned. Personal causes of accidents are very definitely recognized. When an accident is investigated we may indicate that it occurred because a man was in a hurry, was inattentive, or was angry. In each of these cases we realize that because of his condition at the time he did not safely perform his assigned task. These items are generally descriptive of the man's condition at the time the accident occurred. If we are to productively work towards reducing accidents, I believe that we must realize that there is a deeper cause involved. It is necessary to know not only how the man behaved, but why he behaved as he did at the time.

We will next look at how human behavior is involved with accident causation. It is obvious that in the space available we cannot deal with all possibilities. Therefore, we will take a look at five basic areas of human behavior and how they do affect us and the people who work for us.

The first of these concepts is that of the whole man. Man is made up of a physical body, an intellectual apparatus, and an emotional component. Any one of these three areas, or any combination of them, can cause an individual to be involved in a human loss. From a physical standpoint, it may be fatigue or illness; from an intellectual standpoint, it could be a lack of experience or poor training; and from an emotional standpoint, we know that when we are emotionally upset we

do not clearly think. Further, our emotions can also affect our physical being and on many, many occasions do influence the intellectual decisions that an individual makes.

The second concept involves motivation, or the basic needs and wants that all human beings have. There are many motivations involved for all individuals, but five basic ones that affect all people involve their wanting to know what's going on, having a feeling of belonging to the group, wanting recognition for the job done, wanting to be liked by their peers, and to have security. If, on the job, these motivations (needs) are not satisfied, the individual concerned will consciously or unconsciously work towards satisfying them. As the individual does this, there is a very strong chance that he will become one of our troubled workers.

The next concept of human behavior is that of the unconscious mind. Whether we are aware of the fact or not, whether we like the idea or not, we are largely controlled by our unconscious mind. Many of our motivations are deep in our unconscious mind. Things that we do, without thinking, are done to satisfy these needs and wants. Much of the behavior that we find it difficult to explain can be explained by unconscious motivations.

The fourth of the concepts involves individual differences. No two people are alike. We differ from a physical standpoint, from an intellectual standpoint, and emotionally as well. The physical and intellectual characteristics are genetic in origin, and there is a possibility that we can modify ourselves in both areas. For example, we can modify our physical being through exercise, and our intellectual apparatus through study and training. Our emotional component is largely a learned response. The first eight to ten years of our life will generally set our personality structure for our remaining life. From a job standpoint this is important to know and to also realize the fact that it is almost impossible to change or modify an individual's personality. This means that the people who come to work for us come with their personalities largely set. We should attempt to place them where they will fit and to realize that they are different individuals as far as supervision is concerned.

The last of the basic concepts of human behavior involves stress and reaction. All people are subject to stress each and every day of their lives. When placed under stress they will also react. The mature individual learns to react under stress and maintain his equilibrium. He realizes that he is not going to solve all of the problems that confront him and that on occasions it is necessary to make an adjustment and compromise. The individual who has not reached this degree of maturity does not make an adjustment, but rather adopts a defense. Some of these defenses have already been referred to as the human losses that plague industry today such as illness, absenteeism, accidents, etc. Again, these are the people who we call our troubled workers, the 12 per cent of our work force that can account for 85 per cent of our losses.

We oftentimes use the term "accident prone." Reliable studies indicate that the individual who is actually accident prone makes up a very, very small percentage of our work force. The individuals we are referring to could better be termed our "loss liable" workers. This is the individual who at the given moment does not make a satisfactory adjustment, but rather adopts one of the defenses which causes us a loss in one or more areas.

To recap, a troubled worker is a man or a woman with problems to which he can't adjust. Age, job, and education are no barriers to becoming a troubled worker. The individual is troubled because of problems off the job or problems that are job related. A complete listing of the methods of recognizing a troubled worker is impossible here, but a few areas include a complete change in job performance, a marked change in personality, a change in physical being, and an individual who has drastic changes in his social patterns.

What do we do about the troubled worker? While they amount to a small percentage of the total labor force they cannot be ignored, because of the large volume of losses they produce for us. It would be impossible to tailor a human factors program in the space alloted for all concerned. As a result, it will be necessary to talk about it in rather general terms.

The first step is a close look at the selection procedures. For years we have been concerned about an individual's aptitude. In addition to aptitude, it is important that we also consider an individual's attitude: is he willing to do the job?

Supervision plays a very important part in dealing with our troubled workers. This involves the placement of people, providing proper training for both employees and supervisors, maintaining good working conditions, maintaining the most effective communications possible within a plant, developing a safety program that recognizes the fact that people as well as things cause accidents, and the most effective use of medical personnel.

A good troubled worker program for an entire operation should include such items as a definite company policy, direction by an individual with the necessary training, maintenance and use of records, training throughout management and supervision in the handling of the troubled worker and the resulting problems, referral of troubled workers to individuals or agencies that are qualified to give assistance, maintaining liaison with community organizations designed to assist troubled workers, and an effective follow-up program to assure that an individual who has been helped does not again slip into the troubled worker category.

The values in recognizing that human factors play an important part in our overall loss picture and attempting to control them include: the possibility of loss reduction in all areas affected by human loss; increased productivity; work force stability; management control over the hardest of all factors to control—people!

THE INSURANCE CARRIER'S ROLE IN FOOD INDUSTRY COMPLIANCE WITH FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

By HERSCHEL BEANE
Ass't. Sec'y., Millers Mutual Insurance Association of Illinois, Alton, Ill.

At this time I am sure all of you are aware of the Williams-Steiger Occupational Safety and Health Act, now affectionately referred to as "O-Sha." The Act itself is prefaced with the words:

"To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the states in their efforts to assure safe and healthful working conditions; by providing for research, information, education, and training in the field of occupational safety and health; and for other purposes."

Your Congress has found that personal injuries and illnesses arising out of work situations impose a substantial burden upon, and are a hindrance to, interstate commerce in terms of lost production, wage loss, medical expenses, and disability compensation payments. It is felt by your government that the people of this country of ours are considered one of our most precious natural resources, and we are not to be wasted or destroyed by our own doing.

The government has now published a

Book of Standards which incorporates occupational safety and health standards, consensus standards, and established Federal standards. The government is willing to recognize all authority of standards such as American National Standards Institute and National Fire Prevention Association. These names are quite familiar to all of us. This list totaled about 1,750 manuscript pages and lays down regulations governing safe walking and work surfaces, fire protection, work platforms, ladders, air pollutants and ventilation, hazardous materials, protective equipment, safety signs, first aid and medical service, hearing protection from industrial noises, electrical equipment, and a host of other items.

The important point about these new health and safety regulations, even though they are somewhat of an adoption of national standards that were previously agreed upon by most industries and issued on a voluntary basis is that now they will be mandatory.

The federal man who will look at your establishment will be called a compliance officer, not an inspector. Compliance will mean the federal man will be inspecting to see that you have already complied with the Federal regulations. He will not be there to show you where you need to comply. His showing you will not be in the form of recommendations, but will be in the form of a citation, which carries a high penalty.

The Federal government expects you to study its new regulations, and by law you must comply with them immediately. You cannot afford to wait until you are checked for compliance.

As well as making and keeping your plant safe for your employees to work in, you are also required to keep records on occupational injuries of any employee. These are a must, and they have to be posted where they can be reviewed by the employees of your establishment. For record keeping, you will have three forms, numbered as Forms 100, 101, and 102. These forms are being sent to all employer establishments maintaining Social Security records. Kits can be ordered from Occupational Safety and Health Act, U. S. Department of Labor.

One provision of the record keeping requirements allows you to substitute your state's Employer's First Report of a Workmen's Compensation Injury, which you now furnish to your insurance carrier, for the supplemental record of occupational injuries and illnesses, O.S.H.A. Form 101, provided the state form you will be using contains all the information required in O.S.H.A. Form 101. The insurance industry will work with the law bodies to see if these WC forms can be revised so they are satisfactory.

At one time or another, all of you have been inspected by an insurance company safety engineer, and now some of you have had the experience of being inspected by OSHA compliance officers. Those who have experienced both types of inspections can probably measure that there is not too much difference in the methods of inspections or the suggestions made by both inspectors.

The insurance industry has taken the responsibility of giving an inspection service to its accounts for many years. We worked on the basis that what would be good for you would in turn be good for the insurance industry. If we guided you in safety and you complied, the results, working under many types of insurance participating programs, could mean an insurance savings to you, our customer. Not only was your interest to reduce insurance cost, but also to protect your employee from injury, which in turn should have helped your overhead cost of production by reducing time-off injuries.

All major insurance companies have taken pride in offering service to all policyholders no matter what their size. Some insurance companies have actually inspected your properties with their field servicemen and engineers to make on-the-job inspections, making suggestions that could make your plant safer for the general public and employees.

Remember, even after you have complied with all of the standards and regulations enforced by the Federal government, you are not done. You perhaps have covered the most expensive part and have taken care of the physical requirement; but what about the employee education? If you do the physical requirements and your employee injuries continue, you still have a serious problem. So you must instigate safety programs for employee education.

If you have a very large plant, you are going to need a safety supervisor. Now, you will not be able to get along without one. This new Occupational Safety and Health Act will require the full time of one or more men to get the job done.

Let your insurance company help you in three ways:

1. Inspection service to assist your plant personnel in charge of safety. Let us work with you in pointing out recognized hazards of your particular type of business.

2. Assist you in setting up safety programs that can work out in your plant with your own personnel. Helping you locate materials and films for subjects to be given at meetings.

3. Consulting service will be available from your insurance company. The insurance industry hopes to keep abreast of the Occupational Safety and Health Act and will make every effort to keep you posted on any changes or possible interpretations of the Act. We will be glad to furnish you information out of our libraries on engineering and standards.

The insurance carrier's role in the new Occupational Safety and Health Act will be no different than what the insurance industry has been trying to inject into the food industry for years. This Act does not interfere with the statutory role of Workmen's Compensation insurance. Your insurance companies will still provide you with advice and assistance in establishing and directing your own loss control and safety programs.

No matter what you ask us to do for you as a consultant, inspector, or advisor, however valuable, this cannot extend to responsibility. The Act makes it clear in its wording that complete responsibility for compliance rests with the employer.

Please remember that the insurance industry is willing and has been geared for many years to assist you with recognizing and complying with standards. However, we cannot assist in legal interpretations of technical standards; on this you would want to contact your legal counsel on the implementation of the various rules, regulations, citations, violations, and judicial proceedings that may be directed toward you.

The Act will set minimum standards that are certain to help in many ways. I am sure none of us would be satisfied with just meeting the standards, or you would not be successful as you are today.

We no longer can just talk safety, as this is just not enough.

EQUIPMENT GUARDING IN EUROPEAN FOOD INDUSTRY PLANTS

By HARRY GETZLAFF
Mgr., Corporate Safety, Quaker Oats Co., Chicago, Ill.

In May of 1971, I visited a number of food manufacturing locations in Europe. During the tour of the facilities, I was quite surprised to note the extent of guarding prevalent in the manufacturing operation. Equipment was generally guarded beyond commonly accepted U.S. guarding standards. England appears to lead European countries in guarding, therefore, my presentation will concentrate on England's practices.

In my opinion, the high standard of guarding can be attributed to compliance with governmental legislation combined with a basic accident prevention philosophy.

Government Legislation. A law similar to OSHA has been in existence in almost all European countries. Governmental inspectors periodically inspect locations, request modification of equipment to meet published standards, etc.

The English standard for guarding is similar to U.S. published standards and has been interpreted by inspectors in such a manner as to give priority to guarding as the primary prevention tool in safety. The inspectors as a whole are condition oriented and can literally quote the law by page, paragraph, etc.

Accident Prevention Philosophy. Most injury causes are attributed to machine cause. If an employee experiences a hand amputation, the cause of the injury would be classified as machine caused, with little consideration for violation of a safety work rule, failure to lock out, etc. The typical solution would be to install a guard at the point of amputation to prevent a similar occurrence.

In European plants, the severity rate and frequency of amputation is quite high. One possible reason for the high experience is the belief that such guarding results in complacency.

BAKERS & DAIRY PRODUCTS ROUND TABLE

The following areas of discussion were covered at this meeting:

Fork Lift Trucks

1. OSHA inspectors are writing out citations for lack of eye wash equipment in battery charge rooms.
2. Driver training programs are difficult to find.
3. Wooden pallet problems are common in most plants: fire hazards, repair problems, stacking problems, etc. There was some discussion on the use of plastic pallets.

Orientation of New Employees

Good programs exist at most companies represented at this round table discussion. Several companies reported that orientation programs had started out with a certain length and then were reduced. Several companies return to the new employee about one or two weeks later to go over parts of the orientation program.

England and Japan: Safety Laws and Standards

Through a general discussion of OSHA laws and what has happened in USA during the recent year, this group of men turned their discussion to safety laws in England and Japan. It was generally agreed that we in this country have adapted our thinking from England, although we are not as progressive in this respect as the English.

Outside Contractors Working on Your Premises

The need for control over this area was discussed. Most all companies have some awareness and control in this area. It was pointed out that OSHA has issued citations to industry that allows outside contractors to violate safety practices that are existing on the company premises. The need for hold harmless clauses and the need for outside contractors to comply with OSHA safety standards while working on your property was agreed as necessary during this group discussion.

Noise Problems

Most companies in attendance have had recent sound surveys and do use protective equipment in problem areas. The matter of enforcement by supervision (wearing of equipment) requires constant attention. It was pointed out that the major effort by industry should be in the correction of the cause of the noise problem.

Office Equipment

One company reported that they had been cited by OSHA for not having office equipment properly grounded.

OSHA Inspections

Companies represented at this meeting from New York, New Jersey, Connecticut, Tennessee, Illinois, have had OSHA inspections since August, 1971.

Reported by DONALD H. ROSS, *Safety & Security Manager, Kitchens of Sara Lee, Deerfield, Ill.*

DISTILLERS ROUNDTABLE

Reported by WILBUR L. GRAFF
Chairman, Distilling Division, Food and Beverage Section, National Safety Council

The quarterly meeting of the Distillers Safety Directors was held during the National Safety Congress on October 27, 1971. There were twelve members and one guest present. Robert R. Kittinger of National Distillers Products Company, Frankfort, Ky. presided.

Clyde Stephens of Joseph E. Seagram & Sons presented a report on the Distilling Industry Fire Loss Manual. An addendum to the Fire Loss Experience Manual for the period 1964–1971 was distributed to the members. The addendum was prepared from all available information in the industry and from information received as a result of a questionnaire sent to members of the group.

Norman Paige of the Distilled Spirits Institute gave a report on the status of federal legislation and occupational safety. This was followed by a discussion of actions being taken by various states to be accepted under the federal plan. It was mentioned that some companies have subscribed to reporting services to keep up with changes in OSHA.

A recent OSHA inspection of one member's plant was discussed. It was pointed out that the compliance officer checked on posting requirements, recordkeeping, employer's identification number (Social Security), fire extinguishers, electrical items, guards on fans, plant air pressure used for cleaning purposes, use of personal protective equipment, housekeeping, walkways, aisleways, as well as, other requirements in the OSHA Standards. The receipt of notification of citations and fines and the manner in which these were handled was also discussed.

D. E. Scheinost of National Distillers & Chemical Corporation reported on Distillers Division's project of collecting and distributing information to members of accidents occurring in the distilling industry. Mr. Scheinost said the project had been completed with good results and asked for suggestions regarding a new project for the group.

It was suggested, and approved by the group, that the new project be a similar program of sharing of information concerning members' experience of OSHA inspections. This would be handled the same as last year's project, in that each member submit his experiences to Wilbur L. Graff of Brown-Forman Distillers Corporation for distribution. The same policy would be applied whereby an organization would not be identified.

Earl Ober of National Distillers Products Company announced that Fred M. Jones of Joseph E. Seagram & Sons would host the next meeting of the Distillery Safety Directors in Louisville, Ky.

DISTILLING INDUSTRY FIRE LOSSES

By CLYDE W. STEPHENS
Safety Director, Joseph E. Seagram & Sons, Inc., Baltimore, Md.

Two examples of distillery fire losses as presented in the industry loss experience book.

In 1963 a cooperative effort was launched by the distilling industry and the insurance industry to develop a history of fire loss experience in the distilling industry. The preface to this study said, "In looking to the future, to establish standards for loss control, to study insurance rates, their adequacy or inadequacy, to evaluate risk as to perils and to attempt to measure loss potentials, we are forced by circumstances to make certain assumptions as to probable losses. As in many endeavors, we look to the past to see if experience holds any lessons to guide us in this direction. It is most logical, then, to reverse losses that have occurred within our industry."

The study covered the period from the repeal of the 18th Amendment in 1933 to late 1963. During this time the known fire losses totaled 64, with a money loss of in excess of $35,000,000. But even more tragic was the loss of life involved in some of these incidents.

During this 30 year period at least 34 persons had been killed and over 30 injured. Let's review one of the most serious incidents.

On March 28, 1960 at the Arbuckle Smith and Company plant in Glasgow, Scotland there was a tremendous explosion and fire in a whiskey and rum handling and storage area. The property and inventory loss exceeded $8,000,000, and 19 firefighters lost their lives.

The cause of the fire was never determined. Only a few workers were on the premises when evidence of something burning was discovered about 7:00 p.m. The storage buildings were not sprinklered, but they were of brick construction. The barrels were stick racked in three high rows. The building where the fire apparently started had only one entrance door, and that was from the interior of another warehouse. Most of the window openings had been bricked up. When the firemen arrived, the one warehouse was full of smoke but no flame could be located. Other fire units arrived. The street outside the building was full of men and equipment. Suddenly, an explosion tore the building apart and walls collapsed on the men in the street. Nineteen men died!

What happened in Glasgow is somewhat similar to what happened at American Distilling Company, Pekin, Ill., on August 4, 1954. The incident at American caused six deaths and 30 injured, with over $7,000,000 in damage—the greatest tragedy in United States distilling industry.

In the Glasgow fire and the Pekin fire the buildings were unsprinklered. In both cases, a fire burned within the building for a considerable period of time without firemen being able to locate the blaze or take effective action to control it. In both instances, the buildings were of brick wall construction with wood interior and had unprotected floor openings from basement to roof. In both instances, the buildings had few windows or exterior openings, which, in addition to making firefighting operations difficult, prevented the venting of products of combustion.

There are two ways in which a flammable gas or vapor can build up within a tightly enclosed poorly ventilated building. First, any burning material will produce carbon dioxide if sufficient oxygen is available. If there is an inadequate oxygen supply, however, carbon monoxide will be produced. Since carbon monoxide will unite or burn with additional oxygen to produce carbon dioxide, it is a combustible gas. If carbon monoxide is formed within a poorly vented building and then an opening is made permitting fresh air to enter, an explosive mixture of carbon monoxide and air can form

and be ignited by a flame. This mixture will explode into carbon dioxide and other heated gases. This type of explosion is often referred to as a back draft.

The second manner in which an explosive atmosphere could form within a whiskey warehouse is that alcohol dripping out of barrels can be vaporized by heat. This vaporized alcohol would normally burn as it is formed, but if insufficient oxygen is available the vapors will accumulate and spread. With a large building it could be that an uneven mixture of alcohol vapor in the air would result. The vapor may be too rich to burn in one area, not rich enough to burn in another area, and just right at some point in between. All that is necessary is for a spark to reach the area where the vapors are in the explosive range. Over the years there have been a number of whiskey warehouse fires. Most of these warehouses have been better ventilated and thus did not explode.

The two incidents just discussed were selected from among those 64 known fires occurring between 1933 and 1963. At a meeting of the Distillery Safety Directors early this year a request was made to update The Distilling Industry Fire Loss Experience book. Through the cooperation of our many associates we have, hopefully, been able to collect the information from 1964 to June, 1971. This summary is being offered as an addendum to the book and will be distributed to all interested parties. This report may not be all inclusive, but it is the best available information we have at the moment. Anyone having additional information is invited to submit this information to the Chairman of the Distillery Safety Directors.

Our fire experience data and summaries of fire tests will contribute to a safer distilling industry. Experience is a good teacher—let's profit from our past loss experiences.

Meat and Leather Industries Sessions

IMPLICATION OF OSHA TO THE MEAT INDUSTRY

By GREGORY PIETRASZEK
Senior Technical Editor, The National Provisioner, Chicago, Ill.

I basically will review the implications of the law as they revolve around enforcement philosophy and/or procedure. I do not intend to review the specifics of standards as published in the *Federal Register,* May 29, 1971.

Firstly, let us establish the fact that the safety inspectors are in point of fact, visiting meat plants. A packer was fined $385 because his washrooms were dirty, his compressing room had water on the floor, and he had an unsafe ladder on the premises. The packer was highly indignant that he, an employer of people, should be subject to a procedure that he felt even the hardened criminal did not have to endure. But nonetheless, the fine had to be paid.

Another packer was fined $65 because he failed to post the OSHA poster, and his plant's coffee pot was not grounded. Just as an aside, how many of you have not posted the poster or, in point of fact, have a three-way plug on your coffee pot?

A major meat processor was fined $1,987 for a list of citations. Included in this was a charge of $56 because a mechanic stood on a 55-gallon drum while working on a vehicle. I guess it was $1.00 per gallon, plus $1.00 tax.

A $200 fine was levied because an order picker, while standing on a rack, was lifted by a high rise fork truck to the upper tier of the holding bay. This was done while the inspector was there. Again a comment: in reading the citation against the plant, the impression might be gained that it is highly disorganized operation. There are four to five pages of citations with about four to five specific violations per page. Yet taken as an overall view of the operation in a 80,000 sq. ft. plant, this might be a highly organized plant, but the record is always on paper and not in a plant syntax.

Furthermore, I was privileged to see some of these citations, and many of the specific violations are for matters that are general, such as failure to properly ground hand tools.

The meat industry does have a poor loss prevention record. According to B.L.S., its frequency edged from 20-30 per cent between 1950/60 and to 40 per cent between 1960/70.

A survey on industrial accidents prepared by the California State Department of Labor showed that lost time accidents for the meat industry in the state in 1960 was 149 vs. 36.6 for the general industry. The lost time was computed per 1,000 employees and defined as inability to report to work the day after the injury.

In 1970 the meat industries rate edged up to 160.3, while general industry had a rate of 38.2. The study claims that the meat industry in 1968 spent $2,000,000 for compensation and medical costs in a ratio of 60-40. In 1970, the meat industry had 2,723 lost time accidents, according to the study.

The meat packing plants had a lost time rate of 210.2 vs. 104.1 for sausage plants. Of the accidents, slaughter departments had 24 per cent; poultry dressing departments, 18 per cent; sausage manufacturing departments, 14 per cent; and boning and trimming departments, 13 per cent.

The largest single accident classification was "struck by or struck against," in which category the department tabulated knife injuries. In this classification the meat industry experienced 45 per cent of its accidents vs. 28 per cent for general industry.

In the other classifications the meat industry was as good as or better than the general industry; for example, in falls, the meat in-

dustry experienced 14 per cent of its accidents while the general industry had 16 per cent. Of the injuries listed in the meat industry, 138 occurred while the employee was skinning the carcass, 246 while cutting and trimming, 175 loading a vehicle, and 135 while handling material. These figures coincide with the results tabulated by the American Meat Institute in its recent sampling of the latest 200 accidents as submitted by seven reporting firms, one of whom reported after the tabulations were completed. However, this late figure only verified the accuracy of the report, as it only changed one classification by one per cent.

In this survey of 1,092 accidents, 15 per cent were struck by, 11 per cent against, and 22 per cent for knife cuts, for a total of 48 per cent. Clearly, until the industry solves the knife accident problem, it will continue to have the dubious honor of being a target industry. This differential of about 25 per cent generated by knife cuts will continue to call attention to the industry. Furthermore, the industry will have to solve this problem by itself.

In his comments at the A.M.I., Dr. Earl Heath, Director, Office of Training and Education, OSHA, repeatedly asserted that the department had no intention of interposing itself between the employer and the employee. In other words, the enforcement of safe work practices was management's responsibility. The expressed wish of some meat associations that OSHA would enforce safety standards between the plants, is just a pipe dream.

In a like vein, officials of the Amalgamated Meat Cutters and Butcher Workmen of North America categorically and vehemently rejected any notion of automatic disciplinary action against an employee who violated a safety rule. It was a nice interview until I ventured the suggestion for disciplinary action for violation of a safety rule. I was told that industry had tolerated unsafe practices for 60 years and labor had no intention of allowing the companies to saddle the employees with this total responsibility. Furthermore, if management tried disciplinary action of this type, it would only generate arbitrary cases at the international level. However, in general, the union officials expressed a willingness to cooperate in any safety programs. They are activating safety committees within their locals. They insist, however, that any union representative on a plant safety committee be elected by or appointed by the union and not be a management appointee. They cited specific plants that they consider to be violators of this simple protocol prerogative. Also, various state and federal officials I have interviewed view the problems of the law as being one of training and education rather than citations and enforcements.

On the plus side is the fact that any citations can be appealed by the company within 15 days in writing to OSHA Review Committee, Washington, D. C., and if this appeal results in an unfavorable decision, it can be further appealed to a Federal district court of appeals. Knowing these facts, the law tends to preclude listings of whims by the inspector, as he knows his findings can be challenged.

Furthermore, in the procedure before he leaves the plant, the inspector conducts an exit interview with the employer representative. There is no employee representative at this meeting. Here is when the alleged violations are reviewed before the inspector makes his report to his area director.

I cannot help but think, from what I hear, that this may be the juncture at which the nature of citations is decided. They may merely call for a corrective action, or they may entail a fine, depending on the attitude of management's representative.

Helping the industry is the fact that federal inspection programming will be first to the plant's that have fatalities; secondly, to those from which complaints are generated; thirdly, the target industry; and finally the general industry.

If we have a program that convinces the employees in general that management has a meaningful safety program and is concerned about their welfare, then one of the red flags is removed, and if the program does prevent fatalities—a good probability—then another red flag is removed.

Management can request the assistance of the regional technical assistant officer in helping to solve plant loss prevention problems. While this official cannot visit a plant to give his advice, he can meet management at a mutually agreed off-site location to discuss problems.

As has been brought out by Howard Rebholz we have to get with it and begin to develop industry safety standards that will help to remove us from the bull's eye.

OSHA 1970: THE BEGINNING OF A NEW ERA FOR SAFETY IN THE LEATHER INDUSTRY

By JACK R. SCHOEMER
Supvr., Industrial Relations, Armour Leather Co., Sheboygan, Wis.

A forecast of the impact of the Occupational Safety and Health Act of 1970 on the leather industry focusing on the major provisions of the act.

Public Law 91-596; December 29, 1970; Williams-Steiger; April 28, 1971. Taken apart from each other these numbers, dates, and names probably have no real meaning for most of us. But looked at together they refer to one of the most recent pieces of landmark legislation and one which will have a considerable impact on our companies and our jobs. That piece of landmark legislation I refer to, of course, is the Occupational Safety and Health Act of 1970.

What is this Act? The Act's purpose is "To assure so far as possible every working man and woman in the Nation safe and healthful conditions." It is applicable to all businesses engaged in interstate commerce except for mining, railroad, and Federal and state government employees who are covered by other laws and other special provisions. OSHA 1970 will cover some 55 million workers, any of which could shut us down. It has teeth, sharp teeth, to it, and it could get you and me if we don't watch out.

How will OSHA '70 affect an employer or, if the case be, an employee? As concerns an employer, "It shall be the duty of the employer (1) to furnish each of his employees employment and a place of employment free from recognized hazards that are causing, or are likely to cause, death or serious physical harm, and (2) to comply with occupational safety and health standards promulgated under the Act."

Now for the employee. "It shall be the duty of the employee to comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to the Act which are applicable to his actions and conduct."

As you can see, most of the burden is placed on employers, and logically so, for as owners of an enterprise we have the responsibility to provide a safe workplace for our employees. But how does the Act purport to accomplish this purpose and policy of getting both the employer and employee to meet its requirements? A few of the methods are:

1. By encouraging employers and employees to reduce the number of occupational safety and health hazards at their places of employment.

2. By stimulating employers and employees to institute new and/or to perfect existing programs for providing safe and healthful work places.

3. By granting separate but dependent responsibilities and rights with respect to achieving the law's purpose to employers and employees.

4. By empowering the Secretary of Labor

to set mandatory safety and health standards.

5. By providing for research, including the psychological factors involved, and by developing innovative methods, techniques, and approaches.

6. By exploring ways to discover latent diseases.

7. By providing medical criteria which will assure insofar as possible that no employee will suffer reduced health, functional capacity, or life expectancy as a result of his work experience.

8. By providing for training programs to increase the number and competence of personnel engaged in the field of occupational safety and health.

9. By providing for the development and promulgation of occupational, safety, and health standards.

10. By providing an effective enforcement program which will prohibit advance notice of any inspections.

11. By encouraging the states to assume the fullest responsibilities for the administration and enforcement of their occupational safety and health laws by providing grants to the states.

12. By providing for appropriate reporting procedures.

13. By encouraging joint labor-management efforts to reduce injuries and disease arising out of employment.

What is the net effect OSHA '70 will have on the tanning industry?

First, probably the most significant of the key provisions of the Act is the authorization for Department of Labor representatives to inspect workplaces without formal notice given to the management that an inspection is to be made. This one provision alone, I feel, will force some companies to take a hard look at their operations not only from the "production" viewpoint, which traditionally has held first priority, but from the viewpoint of how safe is the operation. For example, the following letter was received from a well-known eastern tanning company in reply to a request that this company participate on the Section's executive committee.

Dear Jack:

Thank you for your letter of August 12th. Since our safety director is spending a small portion of his time on this work, and most of his time on other production activities, I don't feel that we could designate anyone to give that much time to the National Safety Council. I realize the importance of this work but until such time when we are more safety orientated, we cannot give it the time needed.

Yours truly,

That letter was signed by the vice-president of that organization. However, I was not really shocked by his reply. It is typical. But you can bet that company executive and his people are now going to orientate themselves to the matter of providing a safe workplace and to do so are going to spend a great deal more time and a great deal more money on safety. This, I say, will be the greatest effect of OSHA people put safety in the category of "Nice if you have it, but alright if you don't." For too long has our industry as a whole suffered with high accident frequency and severity rates because of the "Don't bother me with that safety stuff" attitude of top management. The latest three year frequency and severity rates available from the National Safety Council show the tanning sector of the leather industry far above the all industry average in both areas.

This is not to say that there aren't any companies in the industry concerned with safety. There are many executives who are genuinely aware of the importance of safety and who instill this awareness throughout their entire organization. Their safety consciousness has paid off in reduced compensation payments and insurance costs, and increased employee morale.

Another key provision of the Act which will significantly affect the industry is the related right of the employee himself to request an inspection of a workplace without notice of any kind given to his management. Of course, the Labor Department will look for the request to be based on legitimate grounds in order to honor the request, but this provision gives substantial power to the worker to get management off its behind and provide for him a safe place to work.

One of the results that will be seen from this provision is a closer working relationship between labor and management in this area of safety and OSHA compliance. One tool to meet this end, of course, is the development of plant safety committees, to include union representatives, which will handle employee complaints on safety hazards, perform regular inspections of the workplace and generally get the employee's confidence that his complaint on a safety hazard will be listened to and be corrected as quickly as possible. By getting the unions involved I don't mean that management is to pass the buck to labor in its responsibility to provide a safe work place, but by getting its union representative involved much can be accomplished in getting to the employee before he goes to the Federal level.

The labor movement is not sitting idly by as far as OSHA is concerned. Many of the international offices of the large unions are setting up training seminars for the purpose of making its locals aware of just what rights the individual employee has under the Act. For example, the AFL-CIO's Industrial Union's Department has established an Occupational Health, Safety, and Environmental Affairs Department for the sole purpose of policing the Act to insure an honest administration of it. Therefore, I repeat that it behooves management to take the initiative in developing this working relationship with its union in providing a safe workplace. If it does not, you can be assured that most union locals will assert their strength and their rights under OSHA to force management to do so. Getting the unions involved was one of the recent recommendations of Secretary Guenther to local safety councils and this application should also be expanded to the local companies for the very same reasons.

Another of the Act's major provisions is the directive to the Labor Department Secretary to develop and promulgate health and safety standards within two years from the effective date of the Act. This provision also, in light of the penalties for neglect, will have a significant effect on the tanning industry. Many plants are failing to stay within established standards and codes with respect to machine guarding; proper lighting; proper walking surfaces; proper ventilation of areas having toxic substances and/or fumes; and proper engineering and/or protective equipment with respect to high noise level areas.

In addition, those standards under the present Walsh-Healy Contracts Act under which many tanneries producing leather for Federal government use are covered, will be superseded when corresponding standards are established which the Secretary determines to be "more effective" and will increase the need for a more effective program of engineering and design for safety and health purposes. Initially, of course, the Secretary has promulgated "national consensus standards" which are defined as any occupational health and safety standard which has been adopted by professional standard setting organizations. The Act, as I stated earlier, requires of each employer the duty to furnish each of his employees employment and a place of employment free from recognized hazards that are causing or are likely to cause death or severe physical harm to his employees "and compliance with the occupational safety and health standards" which are promulgated. Those standards other than national consensus standards, of course, must have public hearings held to establish them and findings must be supported by substantial evidence.

Employers, of course, should keep in mind the fact that a "variance" from a standard can be obtained for one-year periods, renewable to a maximum of three years if the employer, under burden of proof, can show an inability to meet a particular standard because of unavailability of personnel, equipment, or time to construct or change his facilities to meet a standard. The employer also must bring forth a program for achieving compliance while taking all available safeguarding measures during the interim period.

Specifically, the areas in the tanning industry where the effects of this section of the Act will be felt are in what we term the "wet" areas as well as in the finishing areas. Here exist some very hazardous areas as far as walking surfaces are concerned what with the slippery conditions existing due to the large amounts of water used in the process as well as various oils and fats extracted from

and/or put in the hides themselves. In addition, with the tanning of leather being highly involved with chemical technology, high amounts of various acids, sulfates, dyestuffs, solvents, lacquers, and finishes are used extensively. This, of course, requires proper ventilation in those areas where such elements are used, as well as personal protective equipment for the individual working with them, in terms of respirators and the like.

In addition, with the many different types of machinery used throughout the process, certain areas are known to have high decibel level readings requiring engineering and/or the providing of decibel reducing personal protective equipment to the employee to comply with established standards. In my company, for example, a very detailed noise and airborne contaminant study was recently made of our operations, and we found some very hazardous areas existing which previously we were not concerned with. We have since shared this information with others in our industry to aid them in gaining compliance with codes and standards covering these areas. Of course, we are not able to reach all of our industry affiliates and this matter of standard compliance, both with those already established as well as those yet to be established, will become another major concern for those who too long have ignored them.

Up to this point I have made no mention of the penalties to be levied on those violating the Act. Let us review quickly at this point just what these penalties could involve. Probably the heaviest penalty that will be levied is that of prohibiting employees from entering a work place where an "imminent danger" to safety or health hazard is cited. This, of course, must be sought through the U.S. District Courts by the Secretary. For each standard violation a maximum civil penalty of $1,000 will be levied. Of course, with the issuance of a citation does not automatically come a penalty. And any penalty proposed will be based on such factors as the size of the business, the gravity of the violation, the good faith of the employer, and the history of previous violations. Appeals to the OSHA Review Commission on the part of the employer can be made within 15 days of the citation or proposed penalty notification concerning either the citation or the proposed penalty, or both. Employees, too, can appeal the time allowed to correct an existing hazard to the Area Director, also within a 15 day period.

For willful violations, the fine to be levied would be $10,000 for each such violation. If a worker should die as a result of a willful violation of a standard, the maximum penalty is a fine of $10,000 and a six month jail sentence. In the latter case, the penalty again would be determined on the same basis as those listed earlier.

As you can see, the Act does have a bite, and I am sure that those in the leather industry who continue to try to get by and violate the requirements of OSHA '70 will feel that bite.

There are some other provisions of the Act which I know will affect the tanning industry's safety concern, such as the revised injury reporting system and the creation of various research institutes, advisory committees, or commissions. But those cited are those which I feel will have the greatest impact on the tanning industry and others as well.

In closing, I would say that although OSHA '70 does not please one hundred per cent everyone on the side of labor, management, or those involved in safety associations such as the National Safety Council, in terms of its not being strict enough with employers, being too burdensome with administrative paper work, as well as being too strict with respect to inspections, citations, and penalties, and with its removing voluntary involvement in safety and the effectiveness realized from that type of participation respectively, the Act will, in my opinion and without a doubt, begin a new era for safety in the tanning industry by jolting those with little or no safety to more safety.

SAFETY STANDARDS AND PERSONAL PROTECTIVE EQUIPMENT

By M. F. LEAHY
Chief, Plant Protection, Oscar Mayer & Co., Madison, Wis.

The respective duties of every employer and employee are stated in Section 5 of Public Law 91-596, the Federal Occupational Safety and Health Act of 1970.

The first set of safety standards promulgated under OSHA were published in the *Federal Register* on May 29, 1971. Subpart I of these standards deal with personal protective equipment.

"1910.132 General Requirements. (a) Application. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers shall be provided, used, and maintained in a sanitary and reliable condition whereas it is necessary by reason of hazards of process or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, or physical contact. (b) Employee owned equipment. Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment. (c) Design. All personal protective equipment shall be of safe design and construction for the work to be performed."

In accordance with these requirements, there is no doubt as to the responsibilities of each employer to ascertain what hazards are present in his plant and then to see that adequate protection is provided for the employees exposed. It is not enough solely to have the necessary protective equipment available. It is also required that the employer train the employees in the proper use and maintenance of this protection and enforce its use by the employees who are exposed.

As yet there are no specific standards extant for hand, arm, or body protection. However, there have been in use protective devices for these parts of the employees' bodies. For example, for hand protection there are in use metal mesh, cotton, rubber, leather, asbestos, and plastic gloves. Forearm protection is available by use of rigid plastic or metal mesh gauntlets. For forearm and upper arm protection for head droppers there is a rigid plastic gauntlet. For body trunk protection there is a wide variety of devices: aprons for specific jobs such as those for boners; raincoats or foul weather suits for those exposed to wetness or severe outside weather conditions; special suits for those exposed to ammonia; warm clothing for those working in coolers and freezers.

Get copies of the protective equipment standards which are applicable to your situation. Determine what hazards are present in your plant by a detailed inspection of your premises. Establish a safety program in your plant which includes: providing the required personal protective equipment; training for employees in the proper use and maintenance of this equipment; regular inspections to assure that the required equipment is being used and that it is properly maintained; and repairing or replacing protective equipment which is no longer adequate or serviceable.

SELECTING A SAFETY DIRECTOR

By HERBERT KLEPPER
Safety Dir., John Krauss, Inc., Jamaica N. Y.

Probably a safety director can best be described as a person wearing many hats. He has the task of directing and coordinating a policy that aims to reduce or eliminate personnel injuries or work-connected illnesses. He must give utmost consideration to his company's production, whether it be in goods or services, this production and sale of its goods being the prime purpose of the company's existence. He must convey that realization to others, that such production can be most efficient if safety is planned for accordingly. As a safety director, he must create and maintain interest in safety for both management and employees.

Perhaps it was this mark of interest by management in safety that led to the position of safety director, or insurance companies insisting that management improve their safety record if they wished to have continued insurance coverage or, as may be the case today, a government agency may be the cause which brings about the post of safety director. In any event, the safety director needs to bring a deep awareness of safety in all its aspects to management so that their support will be given to a program devoted to reducing and eventually eliminating accidents.

No safety program can be truly successful unless it has the support of management. Most people in management are concerned about their employees as fellow human beings, for both their safety and welfare; but as management personnel they are also concerned about the dollar costs that accidents reflect both directly and indirectly. Their concern over such costs would relate to the disruption of production, property damage, medical fees, replacement worker, high compensation awards, and so forth.

As essential as it is for the safety director to have management support, he must also have support from several key men. These key men are responsible for putting into practice those safety policies backed by management. The key men are the supervisors or foremen working with the employees in the different departments.

The training of workers, new to the company or transferred within the company to a new job task, is a most important job function of our key men. The safety director can inform a worker of safe procedures and practices. Part of his duties as they pertain to training would cover all general safety rules relating to lifting, material handling, fire, horseplay, plant movement, and so forth. Also to make the employee aware of penalties that may be levied for infractions. For the new worker, this training must include a complete rundown of his assignment, emphasizing safe procedures and pointing out hazards and practices to be avoided.

The key men must follow through with the training by observing the worker to see that he performs correctly. The supervisor must know how to spot unsafe work practices of employees under his supervision and to show them the correct and safe method. He must seek out and recognize hazards that could result in injuries or damage to property as well as personnel. The supervisor must motivate his work force for safety much as he would motivate them for production and efficiency. He must instill in his people ambition, desire for recognition, security, participation, and pride of accomplishment.

The supervisor can only maintain high safety standards in his department by setting an example himself and enforcing safety. When an accident does occur in his department he should understand what caused the accident, what the effects of the accident might be, and how to prevent the re-occurrence of such an accident repeating itself. The safety director must never assume that a man knows safety because he has achieved supervisory status. The supervisor must be helped to develop safety skills and be fully capable of taking his place as the key man.

The approach to costs understandably are viewed differently by management and the injured worker. A loss of eye or limb to an employee spells out high dollar outlays to a company. To the injured worker, the loss of dollars to the company are insignificant. He wants compensation for his loss, and here the costs would be spelled out as the disability he would be burdened with and the restrictions of motion he would encounter in his daily living.

So far we have determined that a safety director must establish and run a safety program and have management support as well as full cooperation from the supervisory personnel. If this were 100 per cent effective he would have little need to function further, but even in the safest companies accidents do occur, and the safety director has additional tasks.

One of his prime responsibilities is that of recording and investigating all accidents. In fact, this was the first specific requirement made by the U. S. Department of Labor under the Occupational Safety and Health Act. They notified over 4,000,000 work establishments that it was required that three forms be maintained based on accident occurrence or illnesses which were work inspired.

Good safety prevention is learning from experience by studying the causes of accidents. Until it is determined what went wrong and why, preventive measures can not be properly taken. OSHA Form 101 entitled, "Supplementary Record of Occupational Injuries and Illnesses," is so constructed that as the questions are answered, the preparer is learning what happened—what tools or equipment or material handling was used and how they were used, what events resulted in the injury, and what other factors contributed to the accident. As I mentioned earlier, it is the responsibility of the supervisor to initiate the accident report. His prompt action following an accident will preserve the details of the occurrence. He must talk with the injured worker first-hand, as well as with those who were witnesses to the accident. If the human element is to blame, it will probably be acknowledged during the interview. The safety director should further investigate all accidents.

But Form 101 is just one paper of the OSHA record keeping requirements. The Labor Department officials have wisely required that our safety director consolidate all accident reports so that he may recognize any patterns of trouble. Are certain departments or individuals particularly accident prone? Is there a trend that can be changed? How does the accident pattern compare with that of other firms with similar operations? Here is a case of learning from experience.

Regularly scheduled inspections for the observation of both hazards and unsafe working habits constitute one of the best accident prevention procedures. Whether they are carried out by a safety committee or the supervisor, such inspections and observations are still the ultimate responsibility of the safety director. Insurance carrier safety engineers, safety organizations such as our National Safety Council, and representatives from government units can be very helpful in making inspections and offering to the safety director aid and advice. The inspections should cover such items as lighting, ventilation, floors, stairs, guards, equipment, and so forth. Speaking for our plant operation, we take particular note of unsafe work habits such as pulling rather that pushing of hanging smoke trees, hands not exposed to pinching points when pushing or pulling equipment, adequate number of people for lifting or moving heavy units, proper methods of lifting, carrying of knives, condition of floors, and other work practices found in both meat plants and plants in general.

Medical attention for injured workers is another task of the safety director. His plant can maintain a first-aid station or a full time medical staff, depending on the number of employees and on near-by medical facilities provided by community. His medical program should include pre-employment physicals to detect existing defects and health liabilities.

Mechanical guards on machinery and personal protective equipment would also fall under the guidance of the safety director. Each job task has various potential hazards and may require personal protective equipment, be it goggles, mesh gloves and aprons,

arm guards, safety shoes, etc. All the equipment that is made available is of no use unless it is worn and utilized. Constant vigilance is required of the supervisor (again, our key man), to assure that employees are using such equipment. Likewise, mechanical guards can protect the worker if they are in place.

The use of personal protective equipment and mechanical guards by the employee will be accomplished easier if the employer has an active interest in safety. It is important for the safety director to maintain employee interest. Once safety becomes too routine, interest will wane. Employees should have an opportunity to offer suggestions, to advise, and to assist in promoting safety by communicating to a plant safety committee, the safety director, or their supervisor. Constant reminders of accident prevention—wall posters, bulletin board signs, literature—are all supplied by the National Safety Council. In our plant we have signs and literature in the Spanish language for our Spanish-speaking employees.

Since the safety director is more alert to mechanical hazards, his advice should be solicited when new machinery is purchased and plant construction or remodeling is undertaken.

The safety director need not be a specialist, but able to recognize dangers and hazards to both persons and property, and to call for assistance in problems that are too complicated for him to handle. He may obtain such advice from his engineering department or outside authorities. Not to be overlooked are the manufacturers of machinery and the suppliers of potentially toxic material. Warnings printed on machinery directions and on containers should be read and noted. Help from the manufacturer or supplier should be obtained easily, since it is in their own best interest that their product be used in the safest way possible.

The safety director can establish a safety committee. In our plant, the safety committee consists of employee representatives, a member of the engineering group, a representative of our insurance carrier, a representative of the state Department of Labor, as well as myself. A safety committee can do much of what has already been mentioned. The committee gives management an opportunity to show its interest in safety by allowing for the committee and by seriously considering their recommendations. Our safety committee is one of the facets of two-way communication between employees and management. We find some of our employees are reluctant to discuss safety with their foreman, but will be quite candid about it at our monthly meetings.

A safety director's job can be a very challenging experience. It can be rewarding to him personally for a job well done. It will gain him the respect of the company's general work force for being ever vigilant to their needs for good sound and safe working conditions. It will also gain him the approval and support of management for alert, active safety policies and practices. He will save his company considerable time, money, and insurance expense, as well as improve his company's public relation image.

The safety director is concerned about the care of his fellow man. Isn't this what living is all about?

WHY A SAFETY PROGRAM?

By RICHARD W. TURNER
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Today's needs and demands for the establishment of a safety program in almost every industrial and commercial enterprise, brought forth primarily as a result of the Occupational Safety and Health Act of 1970, has shifted the question of "Why have a safety program?" to "How do we establish a safety program?"

A number of years ago the consultative approach to safety was developed and utilized by some insurance carriers and the Federal government to assist management in the development of a safety program. The consultative approach to safety in industry is advocated as the modern technique of industrial accident prevention. It is usable by state safety inspectors, insurance company safety personnel, and others acting in an advisory or enforcement capacity. This consultative method of safety promotion is an effective supplement to routine inspection and other educational and promotional means now being used.

Consultation is defined as "the act of consulting or conferring." Applied to industrial safety, this would imply that a person such as a state factory inspector, an insurance company representative, or a person having safety responsibility or interest, confers with management before making recommendations covering employee safety. In practice, consultation goes much further than simply conferring. Consultation involves an evaluation of the physical hazards, the work methods, employee practices, and the current safety activities, and then, after consultation with management, suggesting a complete safety program based on the evaluation survey. It utilizes the best features of inspection, draws on the latest industrial engineering and industrial management theories, employs the most appropriate of educational and promotional methods and techniques, and combines them into a single package tailored to fit the accident prevention needs of the individual establishment.

Safety Inspection

Inspection alone is primarily a means of finding and eliminating physical hazards, particularly in connection with enforcement. Enforcement may mean compliance with the mandatory provisions of state laws and regulations; it may imply compliance with the recommendations of the insurance carriers, or with the policies of an organization; or enforcement may simply mean voluntary compliance with recognized safety standards of one kind or another.

Education and Promotion

Many state and other officials charged with accident-prevention activities realize that educational and promotional activities in addition to enforcement produce better and more lasting results. Education alone is, in some cases, relatively ineffective because it fails with those who are not sincerely interested. But advisory educational and promotional activities, backed by enforcement where needed, have great value when used to prevent industrial injuries.

Insurance underwriters, safety consultants, safety directors for trade associations or unions, and others promoting safety through voluntary methods face somewhat similar problems with respect to the best utilization of manpower. They lack the legal authority of the state factory inspection department, but basically their problems are the same. They can, by persuasion or other means, correct physical hazards uncovered by inspection. In doing this they accomplish the same results that the state inspector accomplished through mandatory enforcement. In many cases they go farther than state inspectors in promoting safety through other than enforcement means. Indeed, much of the progress made in preventing injuries can be credited to educational and promotional activities

carried on by insurance companies, labor groups, and by professional and trade associations without legal authority.

Education and promotion are a supplemental means of reducing injuries. The use of such means is predicated on the fact that worker injury is possible from causes not associated with physical hazards correctable through enforcement. These other causes involve unsafe work practices and embrace the human element in accident prevention. Education and promotion are effective devices for dealing with the human element.

Inspection Integrated With Education and Promotion

All educational and promotional activities should be integrated with inspection activities, and should be based on the specific needs of the establishment. Unfortunately, this is not always done. Inspection and educational and promotional programs are sometimes looked upon as entirely unrelated activities rather than a single integrated program. But where the consultant has the authority to enter, inspect, and enforce, and where this authority is tempered with the knowledge and ability to carry on an effective educational and promotional program based on needs of the establishment, the stage is set for the ultimate help to management through consultation on all problems of worker safety.

The Consultative Techniques

Consultation or the consultative approach, as it is sometimes called, is the blending of inspection with education and promotion, and tailoring the combination to fit the particular needs of the establishment.

It is a planned program based on specific conditions determined in advance by study and appraisal. It is designed to overcome weakness in the present safety program, if one exists, and to provide a well rounded program plan based on tested methods of accident prevention, if none exists.

The consultative approach should be applied on a selective basis; that is, only to those plants most likely to benefit from it. This means that the consultant does not concern himself with plants having good safety records and which have going safety programs in operation. Instead, he selects establishments that have a higher-than-average accident experience and which have either no organized safety programs or ineffective ones. Information on these points can usually be secured from a number of sources, such as accident reports, compensation records, or the extent to which an establishment may be considered a safe place to work.

The consultative approach can be successful only when it has management's support; therefore, the consultant's first contact should be with top management. Some of the information which the consultant will need can be secured only from office records, and without management's cooperation a true appraisal of conditions is impossible.

In utilizing the consultative approach, the consultant retains his authority to inspect and enforce, if he has such authority. He does much more than inspect, however. He provides management with advice on how to establish a complete safety program containing all the elements needed to prevent accidents in the establishment, he assists in setting up the program, he helps train personnel to operate it, and he follows up to see that the program is kept active.

A safety program based on the consultative approach is tailor made. Since it is intended to fit the establishment for which it is designed, a comprehensive survey of the establishment is a prerequisite to its inception. Before the consultant can advise management on what is needed, he must go through certain steps to secure information, and his recommendations must be based on his findings.

The following steps comprise the consultative procedure in determining the type of safety program to recommend for an establishment:

1. Make an appraisal of the mechanical, physical, and environmental hazards of the establishment; also the work practice hazards.
2. Make an appraisal of the present safety program, if any.
3. Formulate a proposed recommendation based on the findings.
4. Confer with management on the proposed recommendations.
5. Prepare a written report containing recommendations agreed upon during the conference.
6. Train staff to carry out the recommendations.
7. Followup.

Hazard Appraisal

The items covered by such an appraisal will, of course, vary with the type of establishment, but the scope of the appraisal can be summarized briefly as follows:

Mechanical and Physical Hazards. The safety consultant should start with a complete survey of the establishment by appraising the hazards for mechanical and physical conditions. Among the conditions to be observed are the following: condition of the building and facilities with respect to structural safety, condition of the floors and stairs, adequacy of means of egress, access to overhead places, and fire protection; layout of the workplace, including such things as arrangement of machines for adequate space about the workplace, width and condition of aisles, condition of materials-handling equipment, and provision for temporary storage of materials, scrap, and tools; the adequacy of mechanical guarding of machines and equipment; the continuity of flow of materials from one workplace to another; control of electrical hazards, condition of wiring, and the grounding of machines and tools.

Environmental Hazards. During the initial survey, the consultant should appraise the hazards which are inherent to the industry, such as: the control of hazardous materials, including the use of toxic substances, corrosive materials, and the like. Particular attention should be given to the generation and control of air contaminants. The possibility of catastrophe through fires and explosion, chemical reactions that might get out of control, and the rupture of pressure vessels should not be overlooked. The matter of lighting, noise, fatigue, and extremes of heat and humidity should also be subjects for investigation and the extent to which personal protective devices for emergency use are provided, and methods used for training workers in their use.

Work Practices. Hazards directly related to work practices should be carefully observed and evaluated. Inquiry should be made to determine the extent to which job safety analyses have been made and safe work procedure adopted. Among important work practices which should be investigated are: use, care, and maintenanance of hand and portable power tools; housekeeping—orderliness at the workplace in storage areas, and in aisles, cleanliness, dust control measures; the degree of supervision given the worker; the extent of job training provided; the safety indoctrination and training of new or transferred employees; the use of personal protective devices such as goggles, safety shoes, safety hats, and protective clothing; the repair and maintenance of equipment with respect to machines, mechanical handling equipment, boilers, elevators, electrical equipment, and the like.

An Appraisal of the Safety Program

Each element of the present safety program (if any) should be investigated as thoroughly as may be necessary to get a clear picture of its effectiveness and its weakness. At least the following should be covered:

Management's attitude toward safety. Is there a clear-cut policy regarding safety? Do workers understand the policy?

The assignment of responsibility for the safety program. To whom? Full or part time?

The present injury rate, costs, and adequacy of recordkeeping.

The extent and thoroughness of accident investigations.

The activities of safety committees, if any.

The frequency and value of safety meetings.

The extent to which employees participate in the safety program. What, if any, incentives are provided?

The attention given to the development of safe practices. Have safety rules been adopted covering specific operations or processes?

The adequacy and effectiveness of plant safety inspections. Who makes them and how often? How are they used?

Formulation of Proposed Recommendations

Following the appraisal of the mechani-

walking and working surfaces. The standard dealing with platforms, railings, toe boards, etc. originated in the 1930's and was revised within the past few years. This will, no doubt, bring about the need for some additional hand railings even though your plant was constructed according to code prior to 1968. The most significant change is that all open-sided stairways, 44 inches or less, must have a railing on both sides. The old standard merely called for a railing on the open side. On stairways 88 inches or wider, railings are required for both sides with a center rail.

Specifications for size of rails and mountings are included in the sub-part. These should be followed to the letter.

There are a lot of platforms used in this industry, especially in the dressing and cutting operations. Many of these are high enough from the floor level to require that they be railed according to specifications in the standard. These railings must be 42 inches high, with a rail at mid-point. Pipe size and upright post spacing are also included in the subpart.

There are current conflicts between Meat Inspection Division requirements and OSHA requirements in this regard. The Meat Inspection Division does not allow railings between a platform and animals being worked on; therefore, all dressing platforms must be open-sided to conform with meat inspection requirements. We can see some instances where this requirement should be relaxed by the Department of Agriculture, whereas in other cases it would be impossible to perform the task on a railed platform. A special standard will be needed for this industry or the issue should be settled through the procedure for granting variances.

Working platforms also require toe boards. In most cases these are beneficial; however, they can actually become a hazard where slippery material falls on a working surface and is held there by a toe board.

Most floor openings and floor chutes will have to be guarded by a railing and toe board. A floor opening is one measuring 12 inches or more in its least dimension in any floor, platform, etc. A floor hole is an opening measuring less than 12 inches but not more than one inch in its least dimension. Every floor hole shall be protected by a cover that leaves no opening more than one inch wide.

All spiral stairways will have to be modified to include a railing so that no one can step on less than six inches of tread. Skylights must be guarded with a standard railing or skylight covers must be installed.

Portable ladders must meet the standard for their intended use. Ladders may be classified as industrial, commercial, or household. Most packinghouse requirements will call for industrial types.

Manhole floor openings must be guarded by a standard manhole cover, and when the cover is not in place the opening shall be constantly attended or be protected by removable standard railings. Manhole barriers are manufactured by safety equipment companies and are readily available.

There are, perhaps, some of the older plants having fixed ladders that will not meet specifications of tread width and distance from any fixed object (7 inches). Also, many do not have rails that carry over a landing point at the top. All fixed ladders higher than 20 feet must be provided with a cage, according to specifications in the standard. Fixed ladders made from bars imbedded in concrete or masonry will be in violation unless they are mounted according to the standard and are of the shape specified in the standard. A lot of the older type fixed ladders of this type are found in manholes and are made of straight bars bent in a U-shape and imbedded in the structure.

The majority of the falls reported in the injury survey were falls at the same level. Here is where the establishment and its employees must, as a general duty, maintain the best possible working surfaces and encourage the types of footwear that are the most slip resistant on the slippery surfaces caused by wet and greasy operations. Sixty-five per cent of the falls involved walking or pulling hand trucks. Most of the accidents were experienced in hog cutting, hog dressing, maintenance, and sanitation departments.

There are, perhaps, many other aspects dealing with the prevention of falls that are detailed in Sub-Part D of the *Federal Register;* however, we feel that the above are most significant from an injury-prevention standpoint.

In Sub-part N—Material Handling & Storage, the appropriate sections having an affect on this industry are "Handling materials, indoor general storage, and powered industrial trucks." Standards upon which this sub-part is based are primarily those adopted by the National Fire Protection Association. Even though these sections of this sub-part do not occupy a large number of pages in the *Federal Register,* they reference themselves to many NFPA standards, resulting in a lengthy list of requirements. In most cases, plants were constructed according to many of these standards at the insistence of their fire insurance carrier; however, the standards are revised and updated quite frequently, and in some cases operators preferred to pay a higher premium rate than spend the additional money to meet the standards.

The general requirements apply to storage 21 feet or less in height. Refrigerated warehousing is exempted from the standard. Therefore, parts of the meat industry affected are warehouses where supplies or commodities that do not require refrigeration are stored. In most cases these warehouses have sprinkler systems as required by either fire insurance carriers or local fire codes. Exceptions might be defined as intermediate storage areas that are non-refrigerated, where a mere day's supply of cartons, etc., are kept adjacent to production areas.

The requirements for powered industrial trucks are based generally on their fire and explosion hazard. However, there is a long list of work rules that are realistic, in our view, relative to the safe maintenance and operation of these vehicles.

Where industrial trucks are used for loading railroad cars, specific means are prescribed to prevent the carrier from moving or being moved during loading or unloading operations or any time an industrial truck may enter or leave the carrier.

Trucks shall be equipped with overhead load guards as protection against falling objects. A backrest guard shall be installed on the forks to prevent small objects from falling rearward from the load, depending on the type of material being handled.

The storage and handling of fuel shall conform to the appropriate NFPA code.

Dock boards shall be strong enough to carry the load imposed on them. Portable dock boards shall be secured in position and properly anchored. Handholds or other effective means shall be provided on portable dock boards to permit safe handling.

Sub-part G—Occupational Health & Environmental Control deals with air contaminants, ventilation, occupational noise exposure, and radiation.

When inspecting your plant for hazards associated with this sub-part, you should pay particular attention to employee complaints about environmental problems. The standards adopted in this sub-part are national consensus standards, but speculate that this is an area where there will be a great deal of enlargement of rules because one of the basic intents of the law was to study the long-term effects of the environment on the worker.

In addition to the list of toxic materials as published by the American Conference of Governmental Hygienists which has been adopted as a standard, the National Institute for Occupational Safety & Health is charged with the responsibility for evaluating the long-term effect of various work-associated exposures and stresses based on a life-time exposure of the worker.

For the time being you should inspect and evaluate according to known possible health and environmental hazards currently recognized as possibly existing in this industry.

Ammonia now has a threshold limit value for eight hours of exposure of 50 parts per million. This is not much above the perceptible odor of the gas. Testing equipment is available to accurately measure the concentration of ammonia in air. A "sniff" test will give you a pretty good idea of the concentration, as detailed in "Safety Guidelines For The Meat Industry." People working in refrigeration machine rooms become quite inured to ammonia exposure and normally suffer no discomfort at concentrations far above the allowable limit. Therefore, the person making the evaluation of a concentration should be someone seldom exposed to these areas. Concentrations will vary according to the condition of equipment, therefore variations can be anticipated from week to

week.

Carbon dioxide can become a problem where dry ice is used for quick chilling of meats. Chemical tests are naturally the best measure of concentrations of this gas; however, you can estimate that you have a problem if a certain amount of breathlessness is experienced with moderate exercise in an area where carbon dioxide is used. In providing ventilation, this gas must be vented from a low level, but attention must be given to providing sufficient make-up air to effect a proper balance with the amount of air being exhausted. These systems can be rather expensive, involving both heating and chilling coils in the air make-up units, depending on climate and season of the year if outside air is used for make-up air. Also, make-up air has to be adequately filtered to prevent problems with dirt and dust that might be induced from an outside environment.

Hydrogen sulfide is a by-product of decomposition of protein materials. This is usually found in enclosed interceptor basins.

The section on ventilation may apply to grinding operations in a maintenance shop where grinder plate facing or similar operations are carried on. This sub-part requires an exhaust system attached to the grinding equipment.

The section on occupational noise will require an evaluation of each individual operation. There are a few standard pieces of equipment commonly used in the industry that exceed the threshold of noise to a limited extent. When a number of machines and pieces of equipment are used in combination, the threshold can easily be exceeded quite substantially.

An accurate evaluation must be made by use of a sound survey meter. The process is not particularly complicated, but everyone using such equipment should receive some training in proper evaluation techniques. The sound survey meter merely tells you you have a problem. It may be necessary to call in an audiometric specialist to use more sophisticated equipment to pinpoint the problem. A good sound level meter for survey purposes will cost about $400. Insurance carriers may be of assistance in helping with noise surveys.

If you have a noise problem, you must first exercise engineering controls and, if it is impossible to operate at the required level, you may then provide hearing protection for employees.

Trades and Services Sessions

NEW METHOD OF MEASURING TOTAL LOSSES IN TRADES AND SERVICES

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A computerized method of recording, analyzing, and forecasting public liability, workmen's compensation, property damage, fire, crime, and fleet losses, and making decisions on control.

Nothing that I will discuss in this presentation is new. All of the techniques, all of the methodology that I will use already exist and are used in other disciplines to answer a variety of questions. Thus, in reality what I am going to explore is the utilization of these techniques to aid us in controlling losses and to evaluate the techniques of loss control. The great virtue of these techniques is their adaptability. By that I mean they can be used to fit almost any type of safety program for almost any industry. These techniques do not require that we fit the patient to the technique, but allow us to fit the technique to the patient. In loss prevention, a difficult situation results when we take an inflexible system and try to fit it to a situation for which it was not designed. The real problem is to build a system that is flexible enough to immediately fit all situations with no diminution in its effectiveness.

In November 1969, Dr. Richard M. Duvall and I had just started to write a series of articles entitled "A Theoretical and Practical Approach to Risk Management" for the American Society of Insurance Management to be published in their magazine, *Risk Management.* Through the series it was our hope to develop a theoretically sound yet practical decision-solving methodology for determining which risk handling device would produce the least cost over time. It was our feeling initially that the science of risk management, if yet it can be called a science, had long been lacking some type of theoretical base which would tend to give rationale to decisions related to the treatment of pure risk which are made on a daily basis by practitioners. In order for us to accomplish this, it would be necessary to develop a methodology which must in the first and last analysis rest on a probability forecast for the forthcoming period. Once a method of developing such a forecast was devised, avenues would then be open for the use of normal operations research tools to measure the cost and benefits expected to accrue from the selection of alternative risk treatment procedures. After a long period of analysis, a methodology was developed on a theoretical level by which one could probability distribution for any peril or group of perils. Although our procedure met mathematical tests for soundness, it was decided that before we merrily proceeded along this path our procedure should be empirically tested. Thus, prior to the February 1970 ASIM meeting we contacted Ray Hodges of Genesco and did the small study for him, utilizing the past experience from one of their divisions, and made a loss probability distribution forecast for that division for 1970. Ray seemed to be intrigued with the results of our inquiry into this field and arranged for us a meeting at the ASIM convention in Miami with the risk managers from J. C. Penney Company, City Products, and Sears. At that time we set up an appointment to do a study

based on this segment of the retail industry to see what an industry sample of this magnitude might reveal and also to find out on an industry basis how good a prognosticator our methodology would be. As time went by, the data which we collected from the firm was massaged by us in various ways, with the intent on our part to neither substantiate or disprove an explicit set of preconceived hypotheses but to provide an analytical insight and to generate hypotheses which might be of immediate use and benefit to practicing risk managers. Initially, loss information was collected from over 8,000 different retail stores. In most cases the information spans a period of five years; that is, from 1965 to 1969 and has now been expanded to include 1970.

The following information was collected from the participating firms following the assignment to each store of an identifying number which in most instances corresponded to that assigned it by the company. The average value and maximum value of inventory, the value of the furniture and fixtures, and the improvements and betterments were then recorded for each store. Zip codes were used to identify locations, and each store was classified as to whether or not it was protected by sprinklers. Information regarding losses was collected in the following manner: the store number, its parent company, the date of loss, the type of loss (that is, what was the approximate cause of loss). Twenty-seven different perils which produced frequent losses were used to determin : or classify the approximate cause of loss. These perils were then grouped into four major peril classes: crime, water damage, fire and extended coverage damage, and miscellaneous.

The information on each store, which included whether it was sprinklered or not, was stored in the computer with the five years of loss information. In some instances information on all losses, that is, from one dollar up, was not available since a number of divisions only kept records on losses greater than some stated deductible. In such cases this information was noted, and this loss information was treated separately. The first step in our analysis was to separate all losses by the major peril group, that is, for crime, water, miscellaneous, and fire and extended coverage. All losses were then grouped according to size in order that the frequency of losses within each group could be determined. The first group composed losses between $0-$200; the second, $200-$500; the third, $500-$1,000; etc. Losses were further broken down to record their frequency according to store size and whether the store was sprinklered or not. The number of stores for each inventory group was also noted, following tables to pick from major peril classifications for the industry this procedure. Since the losses were collected by store location, they were classified on a four-way basis by size and by cause of loss, by inventory value at the location, and whether or not the location was sprinklered. Thus, there was information like the number of fire and extended coverage losses between $500 and $1,000 which occurred in unsprinklered locations having an inventory value of less than $50,000. Since it was known that there were 3,476 locations like this in the sample, the number of locations was divided into the number of incidents to give the expected number of incidents from the stated cause of a particular size was expected per location.

Roughly, our sample makes up approximately 16 per cent of all existing units. The gross sales of our sample group make up slightly more than 30 per cent of all sales of the department or variety store group according to the 1967 census of business. The size of our sample varies from state to state, ranging from a low of 7½ per cent of the total number of stores in this group to a high of 23 per cent of the total number of stores in this group. We further broke down our sample by listing the number of units according to size of their inventories for each state.

The stores in our sample have been divided into two major categories based on whether they were protected by sprinklers or not. Unprotected stores are referred to throughout the remainder of the report as unsprinklered stores. Any store whose sprinkler system did not cover at least 90 per cent of the floor area was arbitrarily classified as unsprinklered. Thus, the sample has a number of stores where partial sprinkler systems were in existence, e.g., covering the trash room or in the restaurant facility, that are classified for the purposes of this report as unsprinklered.

Our sample is composed of approximately 2,000 sprinklered stores and 6,000 unsprinklered stores.

Growth during the past several years of inventory, sales, number of stores, and floor space were compared with the number and dollar value of property losses from different sources. Also, the data is plotted on ratio scales so that the equal percentage changes in the various series will show up as lines having the same slope. To summarize, the sales and inventories have increased at approximately the same rate over the period, and the number of store units increased at a somewhat slower rate. Crime losses, in both frequency and severity, increased at the highest rate, or fire and extended coverage losses increased at the slowest rate which approximated the rate of increase in the number of stores. In aggregate, the number and dollar value of all losses increased at a faster rate than sales or inventories and at about twice the rate of increase in the number of stores.

In our first analysis of loss figures, only data on three factors which might affect losses were collected: the location of the particular stores, which was registered within the computer by use of zip codes; the total values exposed to loss; and, finally, whether or not the store was sprinklered. Since our original study, we have updated it to include on an expanded sample, that is, of about 10,000 units, the following information: the type of occupancy of the store; the type of construction of the store; its housekeeping according to the last insurance or outside consultant's inspection; the square footage of the store; the National Board classification of the town in which it is located; and exposure information. It is our hope that by the end of the year we will have something significant to say about the effect of each of these factors upon actual losses. We will be utilizing techniques associated with multiple regression analysis to test the effect that these factors play in regards to both frequency and severity of loss.

It might be appropriate to comment at this time on the percentage of dollar losses and frequency in both 1969 and 1968. In 1968 in sprinklered stores the largest number of losses occurred due to crime, and they also caused the greatest percentage of dollar losses. However, in unsprinklered stores, while crime accounted for the largest number of losses, fire took the highest toll in dollars. In 1969, the tendency continued, and it is our opinion that this tendency will continue at an increasing rate.

The information that we collected after proper massaging of the data also shed some light into other areas of concern. For example, frequency of loss for both sprinklered and unsprinklered stores tends to rise as the value of the inventory rises, but at a slower rate. Therefore, this would tend to indicate that the premium rates charges by insurers per $100 of value for insurance for fire and extended coverage, crime, or for all other perils should decrease as the values at a given location increase. Thus, by the means of statistical testing, it was found that the size of loss for any sprinklered location is not in any way, shape, form, or fashion related to or dependent upon the values exposed to loss. To restate this: except for permissive considerations one should not expect larger sprinkler protected stores to have larger losses than smaller sprinkler protected stores.

However, this same statement cannot be said to apply to unsprinklered stores. Here we can expect that at least to some extent the size of the loss will be influenced by the size of the values exposed to loss. Particularly this is true for losses resulting from the perils of fire, explosion, wind, storm, and flood.

Following this, the data was also massaged in order to determine if certain states consistently p oduced higher loss ratios per $100 of inventory than other states for either sprinklered or unsprinklered units. For sprinklered protected locations, little if any correlation tends to exist between states producing high losses in one time period and those producing high losses in another time period. To be more specific, if one was to assume that a given state, because of geographical or climatical conditions, would have larger losses than another then we would assume that this would be true in the majority of time periods. Thus, if we compared losses for each state for 1969 and then for 1968 and then for 1967 and 1966 and 1965, we should find that states that we predicted to have larger losses than other states to continue this trend from year

to year, or at least to be in the same quartile. However, the correlation coefficient for all perils is .09, with one representing perfect correlation and zero representing no correlation. We can easily see that the effects of either climate or geography is practically nil for locations protected by sprinklers. This analysis would then tend to suggest that proper insurance ratings for sprinklered stores could be best achieved on a national basis rather than on a state basis.

However, in regard to unsprinklered locations, there is some reason to believe that, on a basis of all losses, some states year after year tend to have higher loss ratios than others. The correlation coefficient here was .59. The map tends to demonstrate one way in which the continental United States could be divided into sections according to pure loss ratios for non-sprinklered protected locations. However, this observation should be looked upon as tentative since the data from our standpoint is insufficient to positively conclude that this represents the proper division of states according to geographical influence upon loss. When we look at states according to losses and crime and in fire and extended coverage and in water damage and miscellaneous, two states in all time periods fell in the top 25 per cent—New York and Florida.

The next thing that struck our eye as we perused the data was the relatively small number of stores that caused all the losses. For example, in 1969, out of approximately 1,750 sprinklered stores on which we had complete information, only 626 of these reported losses and these 626 accounted for 1,904 losses. In regard to unsprinklered stores, there are approximately 5,300 of these on which we have complete information. Of these stores, 420 suffered 1,740 losses. The same pattern was also reflected for losses in the period of 1968, 1967, 1966, and 1965. In 1968, out of the 1,750 sprinklered stores, 604 reported 1,902 losses, while out of the 5,300 unsprinklered stores, 377 suffered 705 losses. If we looked at one chain composed of approximately 625 sprinklered locations and 14 non-sprinklered locations, they had 1,575 losses in the period from 1965-1969. These losses involved 789 stores. Yet, 36 per cent of all losses resulted from less than five per cent of the stores, and less than nine per cent of the stores produced more than 58 per cent of all losses.

Since other companies operated similar stores in these same geographical areas, we attempted to check to see if the same loss pattern was repeated by other operators. The answer to this question was substantially "No." Thus, one is led to suspect that a normal store loss frequency may be a product of management rather than a product of external forces. One other bit of interesting information was also derived from this data. Stores which were closed during the period of this five-year loss study on average tended to have a much higher claims frequency than those that remained open, in the magnitude of approximately two to one.

Prompted by the results of this initial report and OSHA legislation, Dr. Duvall and I decided to look more closely at other operation research techniques to see if they could be used to sift the avalanche of expected loss data to determine (1) when losses for any specific large entity were in control, (2) if not in control, to determine precisely where engineering and loss prevention expertise would be useful, and (3) a more suitable frame of reference between a company and its loss projections and that of its industry. With the aid of Tom Reilly of Schirmer Engineering Company, we set forth to classify the major types and causes of general liability, automobile, and employee accidents. Once this had been done we began to look at some technique that would be useful in answering previously stated questions. We reviewed and then rejected programs which were dependent solely on claims, frequency analysis, reports of average claim size, listing of accident by types, analysis detailing large losses, retrospective premium reports, and analysis identifying patterns or trends by measuring frequency and/or severity against a criteria such as payroll, sales, or related factors normally associated with cost accounting. It was our feeling that such analysis as this tended to force individual locations with their peculiarities to fit a regimented pattern.

What we were looking to find was a device that would aid an executive in making decisions in such matters as whether he should

maintain his safety program at its present level or expand its operations. If the decision is to be based on a quantitative methodology, it requires not just one input but a series of inputs. On this basis a decision is made as to whether or not to take action. A particularly simple method of depicting a decision for this type of problem is through the use of a control chart. In 1924, this device was first used by Dr. Walter A. Shewhart of the Bell Telephone Laboratories. In 1931, Dr. Shewhart published a book, *The Economic Control of Quality of Manufactured Products*, in which he explained his methodology. Since this time, this technique has been used to control various production processes.

Prior to the development of this technique, a firm only became aware of the product's defect after customers complained or excessive waste, scrap, and rejects had caused a sharp rise in cost or a loss of sales to competitors had occurred. In other words, steps were taken to rectify the error only after the damage had been done. Furthermore, when the deterioration was discovered, haphazard trial and error methods were used to take action on the process.

To illustrate the nature of the problem, consider a firm that produces a film-coated wire. The aim of the production department is to keep the wire coating uniform. Complete uniformity, however, is not possible, for variability is a rule of nature; hence, the resulting thickness of the film's coating is characterized by its variability. Thus, from hour to hour the thickness of the film upon the wire will vary simply because of the variability inherent in the process. Since, then, some variability is expected, a question continuously arises as to whether or not the observed change in the quality characteristic may be due to something inherent in the process. The question must be answered, because if the observed change is actually due to a significant process change then this process should be immediately investigated.

Obviously, if the variability of a process is such that its behavior can be attributed to common causes, it is best to leave the process alone. The process then is simply operating within the limits of its inherent capability. To search for special causes under such circumstances would be costly and wasteful and might even result in injecting trouble into a process in which no trouble really exists. However, if the behavior of a process is such that the presence of special causes is revealed, then action to search for the trouble should be immediately taken.

Since the decision on the process is based on sample observations, the risk of incorrect action exists. Or, if we leave the process alone and no special trouble exists which affects the process, then we have made a wise decision. On the other hand, if special trouble exists, then our decision is incorrect. Furthermore, if we investigate the process and special trouble does exist, then our solution is correct. But if no trouble exists and the variation is due to common causes, then we have made a costly and unwise decision.

The control chart methodology presents graphically a decision rule for determining the appropriate action on the process. The chart is interpreted as follows: if the sample mean falls between the lower control limit and the upper control limit, leave the process alone; if any sample mean falls on the control lines or outside of the control lines, investigate the process. Thus, it is assumed the variability within the control lines is due to the inherent nature of the process and unless this variability differs widely from the norm, no special investigative procedures are necessary.

Normally, the center line on a control chart is set at the expected norm and the upper and lower control limits are placed at a distance of three standard deviations above and below the central line respectively. These limits are, therefore, normally referred to as the signal limits. If a sample proportion falls within the three signal limits, it is indicative of results from common causes and no action is taken on the process. If the sample proportion falls on or beyond the three signal limits, action is taken to look for special causes. Since this decision is based on sample observations, risk of incorrect action exists.

Without delving into the mathematics of the procedure, the control chart can be easily utilized to determine whether accidents are in control or out of control. However, this technique is only operational when applied

to some process which is taken to be statistically in control. If the process is not in control, it is not possible to predict the pattern of its future behavior except to say that it is likely to stay out of control. The control chart will be descriptive of the behavior of the sample proportions only if the process is acted upon by common causes. Therefore, in order to use the control chart for maintaining control, it is essential first to secure statistical control for the process. A check must be made to determine the nature of the special causes that seem to be affecting the process and to correct them if possible.

For our particular purposes, we will let the center line of the control chart represent the average number of accidents per period of time. Our problem is simple here. What we need to do is estimate the number of accidents above the expected number that will occur due to common causes, so as to set the upper control limit. We wish to do this in such a manner that the cost of investigating false responses, that is, when we are signaled that the process is out of control, will be equal to the cost associated with failing to investigate. For example, let us assume that the number of accidents in a retail store varies from week to week. The number of workers employed and the hours worked remain fairly constant from one week to the next. Thus, the exposure to accidents remains constant. The firm wants to use a control chart to determine when and when not to take action on its safety program. Since it would be impractical to wait 25 weeks to obtain 25 points that are usually required to set up the control chart, 13 weeks' experience were used initially to establish it.

The number of accidents is defined as the number of first aid cases. In the first week, there were 13 accidents; the second, 12; the third, 9; the fourth, 15; the fifth, 11; the sixth, 16; the seventh, 17; the eighth, 15; the ninth, 17; the tenth, 15; the eleventh, 16; the twelveth, 14; and the thirteenth, 12, or a total of 182 accidents. Thus, the average number of accidents is simply 13 divided into the total of 182, or 14 accidents. If we assume in this particular distribution that the mean is equal to the variance, then the standard deviation will equal the square root of the mean or the square root of 14; and if we moved three standard deviations above the mean, the upper control chart limit would be 14 plus 11.2, or 25.2. Thus, from this we could easily see that all points of all weeks' accidents fall within the control limits. In other words, the number of accidents per week vary because of common causes rather than because of special programs. The lower control limit can be set by the same means. Here we would have 14 minus 3 times the square root of 14, or 2.8.

Let us assume now that our particular firm utilized this control chart methodology for future evaluation of its safety program and also assume that the following data was compiled from the ensuing ten weeks: The fourteenth week, one accident; the fifthteenth week, 15; the sixteenth week, 27; the seventeenth week, 16; the eighteenth week, 14; the nineteenth week, 16; the twentieth week, 16; the twenty-first week, 17; the twenty-second week, 18; and the twenty-third week, 4 accidents.

The control chart indicates that in the first week a point was below the lower control limit. This was investigated and it was found that minor accidents were not being reported by the newly hired plant physician. The physician was then instructed as to the proper accident reporting procedures. In the third week a point was above the upper control limit. This time, an active investigation revealed that the workers were failing to wear safety glasses, and the matter was corrected.

When such a system is utilized for an entire chain or a large chain, not only can tests be run to determine whether the accidents at any one location are in control or out of control, but also tests can be run to determine whether the types of accidents and/or causes are in control or out of control. Furthermore, tests can also be conducted to find out whether the part of the body that is injured is normal or abnormal. Finally, the perimeters, that is, the upper and lower control limits for the entire company may be easily compared with the upper and lower control limits of other companies to determine if significant difference occurs and if so, what accounts for this difference.

Although the use of control charts and statistical analysis offers no panacea for the

problem of on the job injuries, automobile injuries, or injuries to the general public, it does afford to all a methodology wherein one can determine if arbitrary standards of safety as prescribed by the government or outside safety experts are effective or not; or if they are, then the expected number of accidents should decrease along with the perimeter of the upper control limit.

However, it is my personal viewpoint that the only effective means of study can emerge from an analysis of accidents within an industry rather than from accidents occurring from a specific type of job such as that of mechanic, carpenter, or machinist. In order to do this job as effectively as possible, I suggest that a data loss bank be established for each industry, utilizing the standard industrial classification in which losses are kept according to the OSHA guidelines on a state by state basis. By the utilization of scanning equipment coupled directly into the computer, the cost of establishing the data for the bank would be nominal compared to the information that would result when the data was massaged in various ways. The only effective way of interpreting the mass of data that will result from the record keeping requirements of the OSHA legislation is by use of statistical techniques.

The control chart methodology represents a graphic decision rule for determining whether or not to take action. However, the possibility of taking incorrect action invariably exists; that is, the risk of taking action on the process if no trouble exists—the alpha risk; the risk of not taking action on the process when trouble does exist—the beta risk. Theoretically, the alpha risk and the costs which are associated with it should be equal to the savings that result when action is taken on the process when trouble does exist. Thus, here we would have the old marginal revenue/marginal cost analysis of economics. In practice, a three sigma control limit is usually used in preference to the direct specification of the alpha risk in terms of probabilities. The usage of the three sigma limit to a large extent is dictated by historical experience with this limit; thus, many argue that precise probability limits are not needed since at best these probabilities are approximations. However, I would feel that without proper testing it would be unwarranted on our part to accept the standard three sigma test.

To recapitulate, since variability is a characteristic of accidents as to both frequency and severity, in order to control losses it is necessary to determine which accidents accrue from common unassignable and uncontrollable causes and which are derived from special or controllable causes. Common causes are inherent in the nature of our work and are usually difficult to isolate and correct, while special causes are identifiable and subject to correction. The purpose of a control chart is to attempt to sift out the common causes from the special causes and so serves as a basis for deciding whether or not to look at special causes.

Since variability characterizes the number of accidents, two types of incorrection are possible: (1) taking action on the process when no trouble exists; and (2) neglecting to take action when trouble does exist. The probability of taking action when no trouble exists must be weighed against the cost of taking no action when trouble does exist, utilizing the normal marginal costs/marginal revenue type of analysis. The control chart, therefore, may prove to be an effective means of utilizing the resulting OSHA record data to reduce accidents.

Other quantitative procedures may be utilized to compute the probability that aggregate losses in some time period would be less than some value. This technique has been utilized by us a number of times to determine for any one firm and its industry what the probability was that the firm would have losses less than some dollar amount in the forthcoming period. In order to do this, the frequency of loss for each loss size group is used to produce a severity of loss probability distribution. The severity of loss probability distribution attempts to answer one question. That is, if any one location should suffer a loss, what is the probability that this loss will be less than some stated amount? Technically, the severity of loss distribution was in reality a gamma distribution which has proved to be a rather conservative measure of severity. By conservative, it is meant that through the use of a gamma distribution

one tended to overstate slightly the dollar consequence of any given loss. This severity of loss distribution is then integrated with the frequency of loss distribution in order to project the probability that aggregate losses for specific perils such as, in this case, fire and extended coverage, would be less than a given stated amount in the coming year.

It is our hypothesis that if sufficient material can be amassed, that is, given the location of the store, the type of protection, housekeeping, managerial policy, etc., we might be able to project the probability that the aggregate losses will not exceed specified figures during the coming year for the entire group of stores. Thus, the information that might result is seen on the fire aggregate loss distribution chart.

In conclusion, let me state that the quantitative technology for analyzing large groups of data is available now. This present generation of computers is capable of storing this data in usable form at minimal cost. Quantitative procedures are available to minimize both the cost of accidents, suppression, and to determine where additional safety inspection would be warranted. What I am proposing is the use of a quantitative methodology to examine the present safety standards, common causes of accidents, and special causes of accidents and recommended procedures for mitigating these accidents. To many corporate executives, safety programs today only signify additional corporate expense. Thus, every dollar relegated to safety must be spent in such a manner as to produce the greatest possible good. It is not in your interest to utilize untested rules of thumb as the sole guide in making safety recommendations.

My primary concern with these rules is that they have combined or tended to combine in a manner that allows for the growth of safety program cost with negligible effect upon reducing either the frequency or severity of loss. Unfortunately, these rules still exist throughout industry segments, whether they be large or small. Perhaps it is always the sad consequence within any field of complicated managerial endeavor which has failed to develop for itself a complete theoretical framework. Rules of thumb whose ancestry is cloaked in the mirky shrouds of antiquity, almost like tribal incantations handed down from witch doctor to witch doctor, have been passed from one safety manager to the next without a systematic effort to test exhaustively from a retrospective position their real value. These rules of thumb abound not only in practice but also in the literature because they provide general answers using simple techniques which can be interpreted almost as the safety manager sees fit.

However, this "humpty dumpty" methodology is gained at the cost of ignoring the effect of essential variables because they are difficult to handle or analyze. For example, the new rack storage tests have indicated that the use of roof vents is questionable since they may increase the number of sprinkler heads set off without reducing total damageability. Considering the increased cost of construction resulting from their installation, it is doubtful that they should be recommended assiduously by both fire and inspection engineers. The question that should confront one prior to recommending any safety expenditure is whether or not such expenditure is worthwhile—that is, whether the cost of installation will be offset by reductions in the frequency and/or severity of losses. A problem such as this must be solved, but its solution is not simple. Thus, for the time being safety engineering must remain to some degree a compromise between time consuming and difficult technical analysis and wise interpretation of the pervasive factors influencing the almost inpenetrable mist surrounding those risks which can only produce loss.

SAFETY MANAGEMENT IN GROWING CORPORATIONS—CENTRALIZED VERSUS DECENTRALIZED

By ALVIS DOWELL
Safety Director, Holiday Inns, Inc., Memphis, Tenn.

We have heard the case for a completely decentralized safety program where all planning, implementation and follow through is performed at each individual location. We have also heard the case for a centralized program where all management decision, implementation and follow through is done by top management at the home office.

Each of these approaches has its advantages and strong points, but the most effective safety program must be developed by using a combination of these two systems.

We all agree that accidents produce economic and social loss, impair productivity, and retard the advancement of standards of living. Every employee is entitled to a safe and healthful place in which to work. We also agree that accident prevention is good business, since the cost of accidents is always greater than the cost of prevention. We also know that accidents can be controlled by careful planning and accurate operations control measures which are exactly the same as those needed to control quality, quantity, cost, and other important production factors.

Accepting these facts, then it is our goal to establish a dynamic, coordinated, and continuing safety program which we can implement and supervise.

The development of this accident prevention program is a prime function of management, and management will be responsible for establishment of safe and healthful working conditions. Following the line management function, it becomes supervisory personnel's responsibility to be accountable for the safety of all employees working under their supervision.

With the complexities of today's business world and the many Federal regulations which must be met, it is impractical to expect someone at each location to be totally familiar with all the details and intricacies of the existing and changing regulations. Therefore, it is necessary to have a corporate safety staff who will evaluate and analyze the changing conditions and keep the field personnel posted.

The technical services of the safety and loss prevention staff within a diversified company such as Holiday Inns or any other multiple location operation must be able to assist the individual locations in providing programs specifically tailored for their local needs. These technical services should include the following items but in no way should be limited to these items only: trained safety personnel for individual locations; provide safety materials; assist with safety committee meetings; develop health and safety criteria and standards; develop and assist with safety incentive programs; assist with the interpretation of accident statistics; assist with specific health and safety problems; assist line supervisors and managers in setting up their own programs; conduct periodic surveys for physical problems; conduct noise level surveys; conduct lighting surveys; conduct air sampling surveys; maintain and evaluate records to indicate effectiveness of program; keep top management informed as to needs and progress; insure compliance with existing Federal laws and standards.

I am sure that there are many other functions that have not been listed, but these items should give an indication as to the type of function that should be carried out by the corporate staff. The corporate staff must be involved in a continuing education program where that they are aware of the changes and developments within their field.

Local Safety Director

The local safety director should be a well informed specialist if he is to maintain interest in safety. He coordinates the program and

supplies the ideas and inspiration while enlisting the arduous support of management, supervisors, and employees. This is a very demanding job which requires diversified talents for which the corporate staff will help train this individual. Since this local safety director often may be called upon to address groups, he should be able to present his ideas clearly, effectively, and convincingly. He may work with local safety councils, trade associations, and other civic or technical groups interested in accident prevention. The local safety director's function will include but not be limited to the following:

1. Administer the Safety and Loss Prevention Program. (All safety problems that cannot be resolved on the shop level will be directed to him.)
2. If applicable, schedule and conduct monthly safety committee meetings.
3. Make a monthly area inspection of the entire plant.
4. Insure that accidents are properly investigated and reported.
5. Be responsible for the proper use and availability of safety equipment.
6. Indoctrinate supervision in your plant with the techniques of accident investigation, area inspection, and other concepts of safety and loss prevention programs.
7. Develop the area inspection check list used by each area supervisor.
8. Insure that correction of hazards and accident causes are made in a reasonable period.
9. Maintain a file of the completed area and inspection forms.
10. Conduct training programs for safety personnel throughout the plant.
11. See that local, state, and Federal regulations are met.
12. Keep local management and corporate safety staff advised as to the effectiveness and progress of safety activities.
13. Coordinate with the corporate safety director any safety problems that cannot be resolved on a local level. In this function, do not neglect established channels of reporting.

We have discussed the role of the corporate safety staff which represents the centralized portion of this combination program. We have also discussed the role of the local safety director. This man serves in a line management function and also reports to the corporate safety director who is in a staff position. This integrated program has an interface at two points. One is between the corporate safety director and the local safety director and the other is between the corporate safety director and local management.

It is the dual responsibility of the local safety director as well as the corporate safety staff to insure the wholehearted commitment and support of local management. It is a known fact that safety does not percolate up from the workers to the supervisors and to management. An effective safety program must be established by management, and it's interest and implementation demonstrated and conducted down through the line function to the employee on the job.

The next individual, who is a key in any effective safety program, serves in a line function at the local operation and must operate from a decentralized standpoint.

The Supervisor

The area supervisor is the key man to create and maintain interest in safety, because he is responsible for communicating management's policy into action and for promoting safe working conditions within the area of his responsibility. How well he meets these responsibilities will determine to a certain extent the acceptance of the safety activities by the employees.

The supervisor's attitude toward safety is a significant factor in the success not only in promoting the various activities but of the entire safety and loss program, because his views will be reflected by the employees in his department.

Setting a good example, for instance, by wearing safety glasses and other personal protective equipment wherever it is required, is one of the effective ways in which a supervisor can promote safety. He should never rely wholly upon safety posters, warning signs, or even general rules, because this will lead to complacency and diminishing good safety programs.

The supervisor can be most effective in giving facts and personal reminders on safety to employees. He should make it his business

to see each employee under his jurisdiction at regular intervals and to discuss with them, briefly and informally, a definite safety idea. Supervisors should be encouraged to take every opportunity to exchange ideas on accident prevention with workers, to commend them for their efforts to do the job safely, and to invite them to submit safety suggestions.

Summary

We have discussed the responsibilities and the functions of different individuals in different positions. It is necessary for the safety responsibility on the local level to rest with a man who has a line function and is responsible to top management in the local plant. The corporate centralized safety staff cannot be on the job at each location and therefore cannot be responsible for the day to day routine. This safety function must be a line position and must be performed at each individual location, reporting to top management at that location.

It is also evident that each one of these individuals cannot be a specialist within the field and will not have the time to analyze and evaluate all of the intricacies which exist and the changes that are continually occurring. Therefore it is necessary to have a centralized corporate staff which is charged with the responsibility of training these individuals, keeping them posted on new developments, and working with top management. The most effective and functional safety program for a growing diversified company must utilize both the centralized and decentralized approach to establishing their safety program.

SAFETY MANAGEMENT IN GROWING CORPORATIONS—CENTRALIZATION VS. DECENTRALIZATION

By RAYMOND C. ELLIS, JR.
Director of Safety Services, Hotel Safety Group, Inc., New York, N.Y.

At a time when the safety of all employees within our corporations is subject to Federal review and control, it becomes incumbent upon management to provide an effective centralized control. There are too many areas where policy-level decisions must be made and implemented.

The program of de-centralized safety management within the lodging and food service industry is weakened through failure to be in an economic or organizational position to assign a full-time safety manager to each installation. Consequently, we find safety is one among many assignments in personnel, insurance, operations, engineering, or some other staff position—depending upon the size and complexity of any given corporation. In this instance, safety all too often becomes the function that is relegated to last place, or becomes an activity entered upon only after the fact of an accident.

With the full time safety management in a centralized position, there is a constant flow of information through one control point, thus affording:

1. Instant notification of all units of accident prevention techniques to be instituted on the basis of an unusual accident. This aspect of a communication center for getting the word out is lost or seriously complicated within a decentralized program. It would be difficult for a decentralized system to alert all other units concerning a specific safety recommendation or warning to prevent an unsafe condition or an unsafe work practice.
2. Warning of safety practices to be instituted in work procedures or equipment controls and procedures to prevent future accidental injuries.
3. Exchange of data on Federal inspec-

THE OCCUPATIONAL SAFETY AND HEALTH ACT'S IMPACT ON PRODUCT AND CUSTOMER SAFETY IN RETAILING

(Seminar Report)

Editor's Note: The above was presented on October 27, 1971, by the Trades and Services Section, National Safety Council at the annual National Safety Congress. This panel discussion was moderated by THOMAS J. REILLY, Manager, Casualty Department, Schirmer Engineering Corporation, Niles, Illinois. Panelists included: GEORGE MATWES, Director of Safety and Medical Services Division, Bamburger's of New Jersey; ANDY HOH, Safety Director of Macy's, New York City; DR. MURRY PAULL, Staff Physician, Sears, Roebuck and Company, Chicago, Illinois; W. R. GAYNOR, Safety Engineer, Sears, Roebuck and Company, Chicago, Illinois. Much of the following also came from the audience.

During the course of the National Safety Congress, practically every Session has brought forth views, reviews, and over-views of the Williams-Steiger Occupational Safety and Health Act of 1970. As you know, this legislation was enacted specifically to provide a safe work place for each and every worker within the United States. It is our purpose in this session, however, to go over some of the specific standards, criteria, and ramifications of this legislation and apply it to the retailing industry as it affects product and customer safety. The panel members are not legal experts, but they are the type of safety professionals with enough foresight and imagination to bring forth a very meaningful presentation on this subject.

The Occupational Safety and Health Act is so far reaching that it will touch the lives of all persons engaged in commerce, their families, and the operation of all business. Some 4.3 million business establishments are covered by this legislation. Because all workers in the United States are exposed to this legislation calling for specific precautions to be made in the construction, care, and utilization of premises, we can anticipate in the future three distinct areas for consideration:

1. An enlightened clientele, exposed to this legislation, will be able to recognize hazards and violations to OSHA. Should an injury result due to non-compliance with an existing standard, it is most likely that non-compliance with an OSHA standard will be used by the injured person in claiming negligence.

2. The enlightened plaintiff's attorney can well be expected to take advantage of this situation.

3. Because of certain standards in existence and applicable under this legislation, certain recognized and long practiced merchandising methods may well be revised.

This is important to the retailer inasmuch as the work environment we are talking about is the same type of environment to which the public is exposed—that is, the retail store.

This is on the negative side. Certainly, the retailer who complies with the standards as put forth should also realize a better controlled work environment and thereby a lower accident frequency for both his patrons and his employees. The stated purpose for this presentation is to bring forth some of the more significant areas the retailer must recognize. With legislation of this type, it may be anticipated that the full impact of the

legislation is in the future. Management, however, must prepare now for the impact of this legislation on his operation. The enlightened management will take this legislation seriously by:

1. Recognizing that he is indeed covered under this law.
2. Cleaning up his work establishment.
3. Evaluating his operation to determine if he is in compliance with standards or not and taking the steps to reach compliance.
4. Training his key personnel to communicate to him any activity which may be in the gray area between compliance and noncompliance with a standard.
5. Form an action plan whereby he can demonstrate his acceptance of responsibility to reach and maintain compliance with standards.

Where does a retailer get such information? How does he know he is properly informed? How does he keep abreast of the ever changing standards and activities of this new legislation? These three key questions can only be answered by the individual retailer. He can exert pressure on the trade associations to which he belongs to channel this information to him. He can rely on competent safety professionals or consultants who are keeping abreast of these developments. He can participate in such activities as the Trades and Services Section, National Safety Council. He can rely on the Chamber of Commerce in his community if such an action program for information is indeed available. He can do it himself—which means reviewing the *Federal Register* on a daily basis and/or communicating directly with the Occupational Safety and Health Administration.

There is no easy answer to the retailer. There is a need for this information, but he must choose the most likely route to achieve knowledge regarding the Act and its implications to him.

The standards referred to are not unattainable nor are they impractical. The interim standards being enforced are consensus standards, most of which have been in existence for many years. They were adopted until the Department of Labor and the Department of Health, Education, and Welfare can produce permanent standards along with those standards which are sponsored by the two recognized standard producing bodies—the National Fire Protection Association and the American National Standards Institute. The amount of pressure the retailing industry as a whole or as a trade association exerts on these bodies will, to a degree, determine the type of rules and regulations under which they will operate. The task ahead is not insurmountable for the retailer, but we must point out this is no time to be lackadaisical or indecisive. The Occupational Safety and Health Administration is inviting comment from industry, particularly participation in standards making and communications from all industry groups. The voice of the retailer must be heard just as the voices of other special interest groups must be heard.

Control of the Environment

The retailer must now consider the environment of the store in toto. This will have to begin on the drawing boards, and it will behoove him to stipulate to his architect or contractor that the structure meets OSHA standards and regulations. This means that every stair tread must be of a certain width and height, that railings must be of a specific height, there shall be sufficient clear and unobstructed means of egress. Signs, emergency lighting, and exit requirements are specific in nature. There are certain health and sanitation requirements which must be built into the structure. The same would hold true for a major remodeling—the need to verify that the existing facility meets requirements.

As far as can be determined, there is no "grandfather" clause. An existing building will not be excluded from complying with such legislation. The only way to determine this is to refer the individual installation problem direct to the Occupational Safety and Health Administration for a reading or a variance.

For the first time, there are illumination requirements on the foot candle power provided on parking lots, in stores, stockrooms, etc.

The customer must be kept out of non-sales areas wherever possible, inasmuch as

there he is exposed to material handling equipment, mechanical equipment, noise, dust, and merchandise piling.

If food is served on the premises, it is best to engineer good protection into the facility. There are specific requirements for fire protection, sanitation, refrigeration, and waste disposal. Even dishwashing is controlled.

All of these relate to the exposure the retailer has to his patron because, after all, the patron is in the same environment as the employee.

Merchandising Considerations

The simply stated requirement that "all aisles and access ways shall be clear and unobstructed" would seem to change the long standing practice of displaying high impulse sales items in aisleways, near doors, etc.

There are now limitations on the amount of flammable and combustible liquids a store may display, with rigid requirements about the placement of such material.

The time honored "Warehouse Sale" carries with it the burden of providing specific illumination, exits, fire protection, control of the walking surfaces, and changes in public liability exposure of the retailer to those practicing such clearance sales.

Radiation given off by color television sets and micro-wave ovens is under close control.

There are specific standards in the amount of small arms ammunition to be allowed on a property. If a retailer sells ammunition he must comply, because if something untoward occurs such as an explosion with the violation of an existing standard, the knowledgeable plaintiff and the knowledgeable plaintiff's attorney can take advantage of this noncompliance with standards before a jury.

There are requirements on labeling, precautions, antidotes, and first aid stated for "harmful and toxic substances" which are used to a certain degree within the retailing establishment in such areas as maintenance shops, the deluxing area, and in the warehouses. Certain of the housekeeping materials would fall into this class of materials. The same merchandise is often held for sale to the customer, and with the advent of the Pure Food and Drug Act there are special requirements for labeling and closure devices. To control children on certain ingredients, wintergreen and aspirin for example, the closure must be of a specific, double action, "child-proof" type. A long hard look by the retailer at some of the merchandise on his shelves, such as garden insecticides, repellents, sprays, solvents, drain cleaners, various plumbing aids, cleaning solutions, and even detergents, open up a whole new area of possible product liability involvement with the patron. This is especially true if a house label is used.

Certain large merchandisers have already formed national "Poison Control Centers" whereby they list not only the product name, but ingredients, nature of the poison, antidotes, etc. These are made available to the National Poison Control Centers around the country and to physicians treating patients. This is good business.

The major retailer may have at his disposal a standards laboratory or a merchandise development research facility. It now behooves the retailer to know what his merchandise is all about. From a product liability standpoint, we know the flammability of certain fabrics, the requirement of nonflammable materials for certain age groups, and some of the other restrictions on merchandising which are in the public's interest.

Operating Requirements

One of the requirements is for the business establishment to have available "within close proximity to the establishment" first aid and medical services. With the shortages of qualified medical personnel available, the medical industry is now forming a "Foundation for Medical Care" which will be established for para-medicals, first aid treatment, and other medical diagnostic services to meet this requirement for workmen's compensation purposes. Emergency first aid rendered by a store physician can, we feel, help control the amount of a personal injury claim, and certainly the retailer who does provide such service creates a favorable impression with his injured patron. Properly done, this will not be an admission of guilt or negligence but rather a demonstration that the retailer is doing what he should do.

Merchandise changes for every retailer. New lines come in, new displays and new fixtures are available. The retailer must now evaluate everything coming into his premises to see that he is indeed in compliance with the Act. Special promotional displays, some illuminated, some of plastic, some of other highly flammable materials, which vendors often provide free of charge, must individually be evaluated by someone competent to determine whether indeed the item meets national standards.

Few retailers maintain a complete maintenance staff. They must call in the plumber, the electrician, the carpenter, the pipe fitter, the elevator service man, the escalator service man, boiler repairman, the air conditioning service man when the need arises, usually on a rush, emergency basis. These tradesmen, when operating in a retail establishment, should bring all their own equipment, they should not use store owned ladders, tools, or equipment. There are specific standards for the types of ladders available for certain types of use. Use of equipment which was not designed for the job and which is condoned by the retail store management may lead to the courts, if it can be proven one of these standards was violated. The trucker who delivers merchandise to your store is another exposure. He has to be provided with a safe place to unload.

Conclusions

It must be pointed out, however, that in all seriousness, the retailer, the state governments, and all industry groups brought about this legislation through failure to clean up the work environment. Why should wholesale and retail trade have a much higher accident frequency rate than the aerospace, the chemical, the auto, and the steel industries? Certainly the hazards are not nearly as complex or sophisticated, and yet employees in wholesale and retail trade are being injured with greater frequency than these huge industrial giants. In addition, the retailer, not like these other industries, must have the public on his premises.

These are the reasons for the retailer to take this legislation seriously and to realize that its effect on him goes beyond merely the workmen's compensation exposure—the injury exposure to his employees. It does affect the customer and the product or service performed. The customers are in the same working environment on the sales floor as are the employees.

Yes, we can look forward to the day of an enlightened, claim and violation minded clientele in the retail establishment. This opens up an entire new arena, as we see it, to the legal profession.

There is something in it for the retailer—a cleaner environment should lower this accident frequency and severity rate if he does indeed take this seriously.

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National Safety Council

A Membership Organization Dedicated to Protecting Life and Promoting Health

March 21, 2001

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