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PRINTED IN U.S.A. 8 1M125302

VOLUME 19 1953 TRANSACTIONS

Current Safety Topics in the

METALS INDUSTRY

as presented in sessions of the Metals Section at the 41st National Safety Congress

(Continued on next page)

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Current Safety Topics in the METALS INDUSTRY *(Continued from cover)*

New Approaches . . .

If safety is to keep pace with today's rapidly advancing technology, we must continually have "new approaches."

Each year, at the National Safety Congress, the ideas and experiences of many of the nation's top safety men are presented in the various sessions. Many of these ideas, devices and methods, first presented at a Congress session, later become generally accepted within their fields.

In order to present this information conveniently and at small cost, the Congress Transactions are published in volumes, one for each Section or Division, along with a General Sessions and Detailed Index to all volumes. The 35 volumes of the 1953 Congress Transactions are listed on the last page of this volume.

Safety directors everywhere have found the Congress Transactions a useful aid in their accident prevention programs. In industry, for example, their judicious distribution to key personnel in management and supervision has proved to be of invaluable service.

In preparing these Transactions, the proceedings of the Congress have been condensed and edited for reference purposes. Complete original manuscripts, with any charts or illustrations which were used, are available in National Safety Council files. Views expressed at the Congress or in this record are those of the Congress participants and are not necessarily those of the National Safety Council.

THE METALS SECTION

This volume is a record of the sessions held at the 1953 National Safety Congress by the Metals Section. The conduct of these Congress sessions each year is only one of the many cooperative activities which the Metals Section carries on in behalf of its members, and for the benefit of accident prevention work in the metals industry generally. The Section gives guidance in the preparation of a great variety of technical and educational material useful in the day-to-day safety programs of metals plants. The activities of the Section are under the direction of its Executive Committee, the members of which are listed at the close of this volume.

Fuzzy combustible fibrous materials will also spread flame quickly across their surfaces.

From these two extremes we can scale down through many types of materials to those which are basically incombustible. The differences are great and appearances can be misleading. Combustible fibrous materials can be painted to slow down the rate of flame spread across their surfaces. Fortunately, many of these materials have been examined and tested in the "Tunnel Test" of Underwriters Laboratories, Inc., and the resulting data is readily accessible. This data can be very helpful in reaching conclusions as to the probable method of flame spread.

There is another factor which explains some of the rather mysterious quick spreading fires that witnesses so often testify leaped across a room or corridor. This is the so-called "flashover" characteristic which has been observed in numerous tests. It is closely related to room temperatures. Observations of test fires show that between 400 degrees F. and 500 degrees F. furniture ignites without flame contact, but when the room temperature reaches the vicinity of 600 degrees F. to 700 degrees F. a "flashover" *frequently occurs*, and the *entire room* appears to burst into flame at once. This is probably the explanation of eye witness stories of flames which seemingly leap across a room or down a corridor with express train speed

At this point I would like to interject one of my pet gripes. That is the term "flash fire." Newspaper reporters all use the term as if they knew what it meant! The public has seen the term so often that they think they know what it means. Unfortunately I don't know what it means, and I wish someone would let me in on the secret. I have talked to many fire investigators and have yet to find one who can define the term. Any one of the fire situations I described a few minutes ago could be termed a flash-fire. So might a slow gas-air explosion or flame racing through the vapors of flammable liquids. Although each one of these situations is different (and we must recognize those differences to trace down the source), we are allowing them all to be lumped under the term, "flash-fire."

Don't ever accept this description from a witness! Instead, continue to question him concerning color of flame, position of flame, smoke present, odors and noises, if any.

Another clue helpful in tracing a fire to its point of origin are the signs which point to its direction of travel. In a Chicago disaster, fire and explosion raced across the *third floor of a factory*. As it went it burned only one side of each pillar and beam. Careful examination of structural members, as in this case, frequently will show more and deeper charring consistently on the *same side*, which gives a clear indication of the direction the fire was traveling. Moving under draft conditions, it does not tend to reach back and burn the reverse side of each structural member but tends to leap on to the next exposed surface.

With the preceding information, we are frequently able to trace the fire back to its point of origin. Then, from points of evidence previously discussed, we can put together the circumstances which brought together combustible materials and a source of ignition. If it traces back to a furnace room, for example, we can reach conclusions as to whether or not there was combustible material close enough to the heat source. Combining this with our knowledge of ignition temperatures of common materials, it is possible to determine how the fire started.

This is a critical point in our search for the fire cause, because many, if not most investigations stop here and die. The verdict: "fire from faulty heating equipment," or "fire due to electrical defect in basement."

The important point, if we are to learn anything for the future, is "why?" Why did the furnace overheat? What happened to the controls? Why? What caused the electrical system to overheat? Why didn't the fuse or over current device prevent it?

Very often the answer is there, particularly in the *first few moments* after the fire, before anything is touched.

I have laid great *stress on the engineering reasons* why this information is needed, but there is another and perhaps even more important factor involved and that is "arson." If every fire was carefully investigated, it would be one of the greatest possible deterrents to arson. Since this is not an arson meeting, I have leaned over backwards to stay away from the subject. However, a study of fire causes and arson inevitably

come together. Both purposes could be admirably served by greater emphasis on the determination of the cause of every fire and why a failure occurred. I believe that photographs taken of the suspected point of origin of every fire would be of inestimable value.

When an explosion occurs, it is even more important to immediately obtain and record important information which could be the basis of future engineering changes. For example, some time ago an explosion occurred in a gas fired oven. This oven was equipped with complete safety combustion controls, but nevertheless it was obvious that flame failure occurred and the gas valve failed to close. Why? Before an investigation could be made a maintenance man dismantled the controls. The result? We will never know what part of that system failed until the next one blows; and then *someone* may pay with his life.

What can we expect then as a result of these investigations? Properly and carefully made they will provide us with the data that will show the failures in our modern technology. Armed with this information we will be in a position to determine the research needed to control our unusual fire problems and will also highlight our relatively simple fire problems that are largely a matter of human failures.

It is equally as important to investigate small industrial fires and classify and tabulate the results as it is to probe major catastrophes. Our major industrial fires were all small incidents at one stage of their development. By understanding thoroughly the conditions which allow small fires to develop we will automatically eliminate major catastrophes.

This is a plea for careful, painstaking fire investigations of all fires, not just those in which there is a suspicion of arson! I am certain that such a program will turn up a lot more suspicious fires than we are now recording.

I find it very difficult to distinguish between the "criminal" arsonist who sets a fire deliberately, and let us say the "involuntary" arsonist who allows a fire hazard to exist despite repeated warnings and recommendations. In each case the end result is the same, a disastrous fire. Only in the one case the time is definitely set in advance.

A well publicized program of thorough investigations of every fire is bound to discourage both types of arsonists previously described. This, in itself, will be a big step forward; in addition, we will be obtaining data to enable us to make the engineering changes necessary to make this a safer world in which to work and live.

The Fourth Dimension in Safety

By FRED C. PRESCOTT
Asst. Dir., Employee Relations, Caterpillar Tractor Co., Peoria, Ill.

You have all seen three dimension movies and probably have done some talking with your friends about the possibility of three dimension television reception in the future.

For years we have known about, talked about, and worked with the familiar three dimensions of safety—*education, enforcement, and engineering.*

I would like to talk about the fourth dimension of safety. This fourth dimension is *enthusiasm*—the one that gives the other three their real driving power. If I could draw a picture showing these dimensions I would make *enthusiasm* the base by which the other three are supported. Without enthusiasm, any of the other three dimensions would fall flat on their faces.

Yes, enthusiasm would have to be the base—but it also can't help being a vital part of each of the other dimensions.

Imagine, if you can, trying to carry out any educational program without it. It would be like shooting your fireworks in the rain. Regardless of how pretentious your display, the whole thing would be bound to fizzle out. Chances are good you wouldn't even get your instructor off the ground. And without an enthusiastic build-up peppering the way, let me ask you: How far into a[n] of all our fine safety books, articles, :

pamphlets do you think we'd ever get a reader?

And could you imagine an enforcement program without your enforcement men glowing with enthusiasm? Suppose they merely quoted the rules, dryly pointed out the hazard, and routinely told the offender how many had been injured by such violations. Do you think for a minute the offender is going to beat his chest and repent? Chances are you'd have to wake him up at least once during your discourse, and I dare say you'd have a hard time keeping awake yourself. No, you don't get very far in your enforcement program without enthusiasm.

Now this enthusiasm has to carry over even to your engineering. Safety engineering isn't a dry matter of rules and principles and problem-solving. Unless you've got real enthusiasm about making an operation safe, or improving an existing situation, your engineering can't reflect your best efforts. Your ideas will be weak-kneed because you didn't have enthusiasm enough to help develop them all the way. The best safety ideas are born when enthusiasm conceives them, promotes them, and triumphantly carries them through to fulfillment.

Granted we need enthusiasm. How do we get it? The only answer I know is tough to swallow: we *generate our own*. Enthusiasm comes from the top down and it is as contagious as the measles. You can't drive, shove, or coax it up from the bottom. Just as an illustration, suppose you plan a meeting on fire prevention. Sure, every October is Fire Prevention Month. That makes it easy—nothing to prepare, just get out last year's notes and dust them off. The same old notes are reworked, a new date placed on them, and five minutes before the meeting starts they are handed to the leader. I'll wager the meeting will go something like this: "Yes, it's October again—another meeting on *fire prevention*. Let's see, fellows:

1. Fires are costly;
2. fires put a lot of people out of work;
3. fires could cause loss of life;
4. fires are really bad things and we must all do our best to eliminate them at their source.

Now let's hear from you fellows on this all important subject of fires." In this presentation, in this example, there has been a complete lack of our fourth dimension, enthusiasm, and because of that, *the meeting* has suffered.

How different it would have been if some good, thoughtful preparation had gone into this meeting. A short color movie, if the facilities were available, *color slides, model*, audience participation. *If you have enthusiasm you'll plan* and you'll conduct a top-notch meeting.

It was our fault that we let a conference leader wilt on the vine. We injected very little enthusiasm in his part of the program. People didn't come to our meetings and when they came, they slept. In the past two years we have been working hard with meetings to give them sparkle, interest and a new look.

Starting right at the top, we took a deep interest in the program, bought a magnetic projector, made two sound movies, prepared handouts for our meetings; put showmanship in the presentations, using flannel boards, blackboards, slides, and other aids. Our attendance at these meetings during the past year has doubled. *Enthusiasm* brought the full house.

At Peoria, we have an expression, "Put handles on it." In other words, give us something we can think about and possibly use. Now let's try and put handles on the fourth dimension, which in our opinion, is most important and must be a part of a really successful safety program. How do you inject this into a program if it is not already present in the desired amounts?

1. Start at the top and radiate this enthusiasm for the all important work you are doing. Be the example setter for this chain reaction of enthusiasm.
2. Merchandise your product. It's a good one. Put it in attractive new packages. Just because it's old stuff, don't wrap it in a newspaper when all others are using modern, colorful, plastic coverings.
3. Give *proper* credit. Others along the line can't become enthusiastic if they never are recognized in the form of a "thank you" for good safety performance. Results in this field are achieved through the efforts of many people and ways must be found to thank them, either through personal letters, a personal thank you, a story in the employee paper, the local newspapers, or some other method.
4. No one can get enthusiasm when they are talking about what's wrong. And things are wrong when accidents are happening. But emphasize what is right. Don't dwell on the fact that two per cent of the people had accidents. No one can get enthusiastic about that. But they can certainly get fired up with the statement that 98 per cent of the people are doing things right and didn't get hurt.

   Scrap isn't reduced nearly as effectively when people are told how much scrap is produced each shift as when they are told how many good pieces are produced.

   Safety people have a tough job in this area because they are always talking to people when something is wrong so it is easy to get into the habit of thinking and talking in negative terms. Be on guard against this and emphasize the things that are right in a positive manner.
5. Changing people around in your own safety organization can be a good way to generate enthusiasm for new assignments.
6. To be enthusiastic you must have an objective in view and thoroughly enjoy your pursuit of that objective. Settle on a purpose and drive to that goal whatever it is.
7. If you don't have enthusiasm, try to learn the reasons why, and in so doing, you may learn that enthusiasm is being held in check by circumstances which can be corrected.
8. Don't you be guilty of killing someone's enthusiasm by failing to report back to them about what happened to their idea or project.
9. A group of trained safety people who are instilled with the feeling of belonging on the team can accomplish more results faster than any similar group who only have the *work for money* feeling. An enthusiastic working safety teams pays off.
10. In the end, if you cannot find or generate enthusiasm, it might be well to seek some other line of work. For your own good, find something in which you can become enthusiastic, for enthusiasm is one of the important elements of success.

I remember a story of a famous trapeze artist who was instructing his students how to perform on the high bar. Finally, having given full explanations and instructions, he told them to demonstrate their ability.

One student, looking up at the insecure perch upon which he must perform, was suddenly filled with fear. He froze completely. He had a terrifying vision of himself falling to the ground. He couldn't move a muscle. "I can't do it! I can't do it!", he gasped.

The instructor put his arm around the boy's shoulder and said, "Son, you can do it, and I will tell you how." Then he made a wise statement. He said, "Throw your heart over the bar and your body will follow." That remark gave the novice the incentive he needed.

Remember that sentence. *Put your heart into your activity.* Put your heart into determining *where you want to go and what you want to do.* Make it so important to you that you will not take no for an answer. Expect *the best, not the worst.* It is what is in your heart, either good or bad, strong or weak, that usually and finally comes to you.

If you want a good program you'll get it *If you work at it with sincere enthusiasm*

Presentation of Awards

By W. J. M. REDWOOD
Safety Supvr., Industrial Relations Dept., Algoma Steel Corp., Ltd., Sault Ste. Marie, Ontario, Canada

I have purposely included the ladies in my situation. They are definitely part of our success as a safety organization. I particularly refer to mothers and wives who give us not only the incentive to work safely ourselves, but the inspiration they give us to guard and guide the manpower of industry. Safety no longer confines its activities to the boundries of a plant, it overflows into the surrounding communities. Safety is a con-

Tip No. 2

Tip No. 2 can be helpful in classifying a pneumatic tool problem. In descaling a roll the operation is done very much in the same fashion as one would descale steel plate or nick concrete. Three years ago this operation was quite hazardous because of potential accidents associated with the breakage of chisels. Lacerated or broken fingers were common because of the inevitable exposure of a man's hand when an end of a chisel broke off.

To understand the fundamentals underlying this failure, we measured from the *origin of the failure to the end of the chisel* as recommended by the suggestion for analyzing failures. Results of measuring 360 such failures produced a frequency distribution which told us immediately that the failures did not occur at the same spot. They varied over a two-inch length. *Tip No. 2* suggests that this is a metallurgical problem. Therefore, we investigated the factors that we thought were related to this failure.

We learned that each chisel was subjected to bending stresses due to off-center impact and these bending stresses started failure in the surface layers. The exact location of each failure was dictated by minute irregularities in the surface. Each chisel had on its surface an unavoidable layer called a decarburized layer and it is a recognized fact that decarburization does not resist repeated stress as well as material not decarburized. We were faced with the problem of either removing the decarburized layer or strengthening it. We decided that strengthening it would be the most practical and we chose to try shot peening the surface of the chisels. By this method, the surface of the chisel is sprayed with the steel shot which closes up any pits in the surface and induces favorable compressive stresses in the decarburized layer.

Our first tests were conducted on a lot of 1,000 chisels. One-half of the lot was the so-called standard chisels that served as a control group that would give us an accurate picture of the performance of unpeened chisels. The remaining half of the lot was shot peened to strengthen the surface layers.

With 500 standard chisels after 14 days service, there were 360 potential accidents, with 360 broken chisels and 140 dulled ones. With 500 shot peened chisels after 39 days service, there were only 10 potential accidents with 10 broken chisels, 13 broken through the stamp mark, and 477 dull ones. While this was an encouraging improvement, we did not stop development work. We learned that by revising our peening technique slightly, we could reduce the 140 dull chisels in the standard chisel pile to 2. Our records show that potential accidents have dropped from about 300 per 1,000 man hours to less than 1 per 1,000 man hours.

Broken Gouges

The same reduction in potential accidents was reproduced in another tool known as the gouge. The origin of failure varied considerably as was indicated by the length of the broken tips. *Tip No. 2* provides the clue as it did in the case of the chisels and, in this instance, too, hundreds of potential accidents have been eliminated by shot peening the gouges.

Stripper Tongs

As with the preceding cases of failure of pneumatic tools, the same techniques are applied to analyzing failures in heavy equipment. A device used to remove ingots from their molds is known as a stripping tong. Our records show that many of these tongs have spread or have broken suddenly in the past. Fortunately, we did not have any accidents; but no one could guarantee immunity under the circumstances with which they were used. In examining the failures in accordance with the suggestion advanced, we learned that the origin of failure varied widely. Some failures were near the lower ends, some were near the pins, and some were midway between the pins and the ends.

Tip No. 2 suggested a material investigation. We investigated the stresses that could be set up in the tongs under various loads, particularly when sticker ingots were being removed. We learned that the material should be considerably stronger to withstand normal operation. We immediately changed the material specifications from annealed plain carbon steel to heat treated alloy steel and almost overnight improvement was noted.

Instead of spreading at the gripping surfaces, the new tongs resist spread. But, more important, is the elimination of breakage. In over two years of service there has not been a case of potential accident.

Axle Failures

Axle failures on rolling stock constitute one of the most serious potential accidents we have to deal with. When an axle breaks, no one can predict final consequences. Fortunately, we have never had a lost time accident due to such failures but we did have a potential as high as 12 in one year.

As many as 12 broken journals off cars occurred in one year. They were all at the same location, the radius at the end of the journal. *Tip No. 1* suggested a design problem.

We studied the design and learned that the ⅛ inch radius at the end of the journal was a stress raiser and it actually increased stresses by nearly 2 times. The responsible factor was obvious to us as investigators, but we felt that we needed visual proof to support our theories. It occurred to us that if the theory was correct, then both ends of the axle were exposed to the same stress levels and, although it appeared that only one journal was broken off, the "unbroken end" should be cracked.

To prove this point, we examined the "unbroken" journal and saw nothing. Realizing that cracks of this nature are too tight to see with the naked eye, we wrapped an ordinary welding lead around the "unbroken" journal and passed current through the lead. This magnetized the axle and after sprinkling magnetic power on the journal we brought out the clinching evidence. Here was proof that the potential accidents were originating in the radius. We redesigned the axles and after three and one-half years of service, not a single failure has been reported.

Shear Knife Breakages

Shear knife breakages are one of the worst kinds of potential accidents because of the possibility of flying pieces of steel. All of the knives were in operation cutting steel beams. Some of the knives were spalled and some were broken. When the knives are examined carefully, the origin of failure is found at a different location, thus indicating a metallurgical problem.

A careful study of this problem showed that high frictional heat was being developed during cutting operations and caused tiny heat checks to open upon the surface and finally leading to these serious potential accidents. By changing the analysis of the material to provide heat resistance we have completely wiped out these failures providing safer operating conditions for the shearmen.

If we have improper balance of material, design, and load, we can expect unpleasant consequences, including potential accidents.

By applying *Tip No. 1*, or, *Tip No. 2*, we have shown how it is possible to achieve proper balance of material, design, and lead, and bring about several pleasant consequences, including reduced potential accidents.

There Is a Man in the House

By M. BRUCE GORDON

Supvr., Employee Services, Industrial Relations Dept. Engine and Foundry Div., Ford Motor Co., Dearborn, Mich.

My discussion is the story of supervisory safety training in the Engine and Foundry Division of the Ford Motor Company.

Before we get into the details of that program you might like to know something about our division and its relation to the overall company operation.

The engine and foundry division is primarily responsible for the manufacture of all automotive engines used in the company's passenger and commercial vehicles. This includes the Lincoln, Mercury and Ford overhead-valve V8 engines and the Ford "6" overhead-valve in-line engine. We also build a complete line of industrial engines as well as a tank engine for the Armed Services. We have eight operating plants, four of which are foundry operations and the remaining four are engine machining and assembly plants. Our employment approximates 33,000 employees at the present time with a very wide range of job classifications.

Our safety department consists of twenty-five safety engineers and statistical personnel each of whom is charged with the responsibility for employee safety in specific areas of our operation. The safety record of our division is comparatively good, especially in our foundry operations where the frequency rate is 80 per cent below the industry average.

The management of our division is well balanced, having the advantage of the enthusiasm and drive of youth and the leadership and guidance of men with long years of experience. The safety of our employees is of prime importance to them and their support and participation in the safety program is the major factor in its success.

The value of training to a well balanced, efficient organization is given full consideration, particularly in the field of employee safety. In charging our supervisors with the responsibility for the safety of their employees, we recognize the importance of providing them with the tools with which to meet this responsibility. In addition to the support and backing, which is so important to the supervisor, the matter of safety know-how, provided through a training program, is of prime importance to the effectiveness of the supervisor in matters of employee safety. Obviously, the better we can equip him to meet his employee safety responsibility, the better result we will get in terms of a reduction in our accident experience. We are convinced that the most effective way to accomplish this purpose is through conference-type management training meetings. Our setup provides that members of supervision attend one of these one-hour training conferences each week. The subjects for discussion include industrial economics, employee relations, methods, quality, cost, employee safety and other related manufacturing subjects.

At the present time one conference each month is devoted to a study of effective methods in the field of employee safety.

This brings us to the supervisory safety training program in the engine and foundry division. This is a formal program developed by the training section in conjunction with the safety unit. It consists of twelve one-hour conferences aimed at better equipping supervision to meet their employee safety responsibility. We have attempted to present the subject in a little different manner than usual in an effort to maintain continuing interest and, at the same time, get it over in an effective and lasting manner. While we cover certain generalities in the program it is, for the most part, devoted to a study of specific safety problems and their effective solution. Thus each supervisor takes away from each conference not only a recognition of his safety responsibility but a thorough and practical means by which it may be effectively met. Detail leaders' guides are provided for the use of the training section conference leaders who conduct these meetings. While our initial outlay was *something over $10,000*, we *firmly believe that the results more than justify it.*

The subject matter of the twelve sessions is as follows:

1. Why Safety
2. The Principals in Accident Prevention
3. The Principles of Accident Prevention
4. The Principles of Accident Prevention
5. Training the New Employee
6. Training the Old Employee
7. Mechanical Inspection
8. Good Housekeeping—Personal Protective Equipment
9. Accident Investigation—Statistics
10. Analyzing a Job for Safety
11. Analyzing a Job for Safety
12. Humanity in Safety

Session One: Why Safety—is devoted to exploring the reason why employee safety occupies such an important place in the industrial scheme of things. We will discuss it more in detail a little later.

Session Two: The Principals in Accident Prevention—has to do with the responsibilities of the principals on a well balanced safety team, the supervisor and the employee. The mutual interest of the supervisor and the employee are discussed and it is brought out that working as a team they can accomplish a high degree of safety in departmental operation.

Session Three and Four: The Principles in Accident Prevention—in reality is an exploration of the well worn subject best known to safety man as the three E's. We felt that the usual presentation of engineering, education and enforcement as factors in accident control was rather dry and ineffective. It was also felt that it did not go into enough detail to effectively present the factors in accident control. Therefore, we took the liberty of dispensing with the three E's and looked at the subject strictly from the standpoint of the major factors that contribute to good industrial accident control. The following is a result of this thinking and we present them as a substitute for engineering, education and enforcement:

1. Safety Engineering
2. Mechanical Protection
3. Safe Practices and Rules
4. Working Conditions
5. Publicity and Promotion
6. Personal Protective Equipment
7. Safety Education and Training
8. Accident Investigation
9. Rehabilitation

Session Five: Training the New Employee—is devoted to a study of the problems of getting the new employee started off on the right foot safety-wise. Specifically it deals with the formal *New Employee Orientation Program* that is in effect in the engine and foundry division which is designed to provide the supervisor with an effective means by which he can give the new employee his basic training in safety.

Session Six: Training the Old Employee—is, in fact, a continuation or follow-up on training the new employee. However, it specifically has to do with a formal *Supervisor-Employee Safety Contact Program* whereby the supervisor meets formally with his employees once each two weeks to discuss safety with them.

Session Seven: Mechanical Inspection—is devoted to a study of various types of machines and equipment in terms of detecting the hazards that can be effectively guarded. This session provides a good foundation for the supervisor in carrying out his part of a formal monthly *Mechanical Inspection Program* which is designed to detect and correct mechanical hazards.

Session Eight: Good Housekeeping and Personal Protective Equipment—is self-explanatory. However, I would like to tell you that emphasis is placed on the value of good housekeeping to productivity as well as employee safety. In fact, it is an excellent measuring stick in determining the managerial ability of Supervision.

Session Nine: Accident Investigation—takes up a study of the principles of accident investigation and, in particular, helps the supervisor to develop a technique in scientific accident investigation.

Session Ten and Eleven: Analyzing a Job for Safety—is, in effect, a proving ground for the previous nine sessions. Actually what we try to do is to put into practice in these two sessions all of the principles of safety as brought out in the previous conferences. This is accomplished by developing, in the conference room, an industrial facility from the ground up. By that I mean, we take a plot of ground, build a building on it, purchase and install machines and equipment, select and train supervisors, employ and train employees and finally produce a product. Throughout the entire development the theme is one of considering appropriate and adequate safety at each step.

Session Twelve: Humanity in Safety—is the closing session and is devoted to the responsibility of industry to operate a safe plant. It further explores the rights, privileges and responsibilities of all of us as American citizens and workers.

This is the story of our *Supervisory Safety Training Program.*

Now, I would like to go back to *Session One: Why Safety*—and give you parts of it as it is put on for supervision by our conference leaders. Since the material is written around the industrial supervisor it will, therefore, be necessary for each of you to assume the role of, say, a foreman in one of our production departments, or maybe you would like to be a general superintendent. In any event, take your choice and we will have a look at Session One.

Many of you members of supervision have probably asked yourself the question many times, "Why is safety so important?", "Why does upper management place so much emphasis on it?", "Why do they spend so much money to guard machines and to provide the many safety devices?", "Why do they support a full-time safety department?". These and many other questions have, no doubt, come to your mind many times. Undoubtedly, many of you have found the answer to them, but, just against the chance that not all of us really understand the basic thinking behind employee safety, we are going to explore it here.

Basically, we might say that all employee safety activity is designed to prevent. To prevent the kinds of things that arise out of and are a part of every industrial injury—human suffering and loss of life and limb.

Take human suffering. I don't necessarily mean the physical suffering that accompanies the loss of a hand or a fractured hip. I mean the mental suffering that every injured person experiences when he comes to a full realization of total blindness or complete paralysis of his limbs. It is probably rather difficult for us, who have never experienced a seriously disabling injury, to realize the extent of mental suffering associated with injuries of this nature.

The story of Bennie may help a little in this respect. Bennie is a man about 50 years old, a fellow just about like you and me. He is married and his family is grown up and are making out for themselves. So Bennie just has his wife and a darn good one at that. I don't know exactly what kinds of things Bennie thinks about, but I suspect that they are just about the same things that you and I think about: working, sleeping, going fishing, retirement someday maybe, and a host of other enjoyable things that are ours as free Americans. Pretty wonderful, if this were the end of the story. But this isn't the end of Bennie's story. One day last March he came into work feeling as hale and hearty as you and me. While he was going about his duties, bothering no one, and with one thought in mind of getting the job done, like a bolt out of the blue came a crane weighing 150 pounds. It struck Bennie on the head, fracturing his skull and spine resulting in permanent damage to the spinal cord, completely and permanently paralyzing him below the waist.

Bennie is in hard shape today. He cannot even answer the call of nature. It has to be taken from him. The doctor says he will never walk again. So what do you think is going through his mind as he sits there in a wheel chair, almost completely helpless. Seven months ago he was a man in perfect health, full of dreams and ambitions, and today he is a hopeless cripple having to be waited on hand and foot. You see that's the kind of human suffering I am talking about.

It is true that the doctor has said he will never walk again but you don't know Bennie. He says he will walk again and if he believes it strongly enough, what right has anyone to say he won't walk out of that hospital someday? The biggest thing that has happened to him in his entire life was his conquering the paralysis in his right arm. You should see the look of satisfaction on Bennie's face when he struggles with all his might to raise it just enough to shake your hand. This is the end of my story about Bennie, but I am sure you will agree with me that it is not the end of the fight that lays ahead for him.

Loss of life and limb—Do you know a man who has lost both hands? If you do, then you probably appreciate the terrible significance of such an injury. If you don't happen to know anyone who has suffered this horrible experience, I will tell you about a fellow I know. You see, he lost both of them in a punch press. He was reaching in, you know what I mean, no tongs! Oh, I know tongs were provided for the job, but they were found crammed into a crevice in the ram. It sort of appears that my friend really hadn't been impressed with the importance of using them. Anyway, he is in pretty tough shape today, what with trying to dress and shave himself and make a living to boot. You see he doesn't have a family so he is pretty much on his own. He will get by all right—though; you see, he has his compensation coming in—but wait! That will run out someday and maybe he will be too old to work by then. Kind of a rough road ahead, don't you think?

Now, who are these people we are talking about? Are they strangers to all of us? People who work for some outfit across town? Let's take a little closer look at them. They are employees who work for you and me. Yes sir! They are the men who come in to work every morning and say to us "Mr. Industrial Foreman, what's my assignment for today?".

Someone has said that, "It can happen here." It is happening here and in other industrial plants all over the country. Fifteen thousand of them lost their lives while at work last year and it is highly likely that an equal number will lose their lives this year. The thing you and I have to decide right here and now is what contribution we will have to make to this appalling figure when the record books are closed for 1953.

We have been dwelling on the human side of this business of employee safety. Let's take a look at a little different phase of industrial accidents.

I spoke of Bennie a little earlier. Do you know how much the legal liability amounts to in his case? Right now it stands in the neighborhood of $76,000. Bennie will get about $22,500 of this and the remainder represents the hospital and medical bill.

Who pays all these bills that arise out of industrial accidents? The companies of course. Who else? Or do they? Let's take a little closer look and see if we can find out who really pays the bill.

The loss of a leg in our state runs into real money. Right now it is something like $9,000. Of this amount the injured employee will get about $7,100 in Workmen's Compensation. The remainder is for the hospital bill and a new artificial leg. A lot of money you say? You are so right, especially when you consider that it took exactly two seconds to spend it. How do you think this fellow feels about it. Is $7,100 very important to him right now? Do you suppose he is thinking about the $38.00 he will get each week for the next 215 weeks? I don't know what he liked to do best. Maybe it was bowling or perhaps hunting and fishing. What do you suppose he will do for fun and entertainment from here on in? Pretty glum situation isn't it? Money gets to be pretty insignificant when you look at it from that standpoint.

One of the very common injuries in industry is to the eyes. The loss of one of them would probably run into a cost of about $7,100. The injured employee would get about $6,100 of this in compensation. Of course, if the eye has to be removed, it leaves a pretty horrible mess or, at least, that's the way it used to be. If you are worried about how you would look with one of them gone, quit worrying because we can reproduce a perfect replica in plastic. It will match your one good eye so perfectly that it will defy detection.

I am told that over 85 per cent of all we know is learned through these two windows of ours. Now I am not saying that, if we pull the shade on one of them that we will only know half as much, but I will guarantee that there will be a lot going on in this old world of ours that you will never know anything about. Our Great Creator was good to us poor, human creatures. He gave us two of everything that he thought we would need two of, so when you get down to one you're getting awfully close to none.

One of the most serious of all industrial accidents is total blindness. Workmen's Compensation and safety folks call it permanent and total disability. A case like this can run into real money. Something like a maximum of $30,000 for Workmen's Compensation alone. But what about this fellow here? Hard to measure his loss in dollars and cents isn't it?

The most serious of all industrial injuries is, of course, the loss of life. The compensation payments to this widow will run into a total of about thirteen or fourteen thousand dollars. Lots of money, of course, but what about these two little fellows who will never again know the pleasure of meeting dad at the door when he comes home from work? What about the leadership of a father that is so important to them in development as good American citizens? Or what about their right to have someone to look up to, to love and worship as just plain dad.

So, when you actually get right down to it, the price of industrial accidents cannot really be measured in any other terms than their effect on people.

A young man just out of high school, looking for a job for the summer, wants to earn a little money so that he can start college in the fall. We just finished hiring him at the employment office and sent him over to fill that requisition turned in for a punch press operator. His dad works over in the die room. Been with us over twenty-five years. Darn good die maker too. Likes it here and tells everybody what a good place it is to work. Got to telling his boy here about our place and so, when he was looking for a job for the summer, he just naturally came to our shop. First real job he ever had, you see, about the only thing he ever did before was work as a stock boy in a grocery store. He doesn't know very much about machinery and factories and manufacturing and things, which accounts for his bewilderment.

This boy needs guidance and leadership. Your leadership and mine. He needs help and instruction, all that we can give him. He is sort of depending on us to give it to him and, when you get right down to it, we

owe it to him. Each of us has a little personal debt to pay off, so here is a darn good place to do it. Remember, we started off like this a good many years ago ourselves. Someone came along and took us by the hand and gave us the benefit of their valuable experience. Remember? Did you ever stop to think that you and I are pretty special people. I mean special in the sense that we enjoy a privilege accorded only to a few. We have been selected as leaders of people. Selected because we stood out from all the rest. Selected because someone had confidence enough in us to believe that we would step up to responsibility. When this selection was made we were given more than just the responsibility for getting a job done. We were entrusted with the most sacred thing in the world, the lives of human beings. These same people are looking to us for guidance and leadership and help. They need the advantage of our years of experience and so long as we enjoy the privilege of being their leaders, it is our sacred duty to give it to them.

A couple of months ago one of your fellow supervisors was telling me about his being in the hospital for a minor operation. While there he struck up an acquaintance with a nineteen year-old boy who had lost his hand in a punch press accident in an industrial plant. He told me what a pitiful sight it was to see that young man lying there with his right hand gone and most of his hopes and dreams gone with it.

During the course of their conversation one day, the supervisor said to him, "Son, didn't they tell you not to reach between the dies when they put you to work on that punch press?" The boy's choked reply was, "Mister they didn't tell me nuthin."

On May 20, 1953, my boy became a man. I shook his hand and gave him a good pat on the back. Yes sir! Twenty-one years old and I want to tell you that it was a hard struggle. Never thought I'd make it. Twenty-one long years of heartbreak and worry trying to make a man out of that little bundle that was dropped off at our house on May 20, 1932.

What with scarlet fever, whooping cough, measles, poison ivy, fights with the kid down the block, trouble at school, breaking out the neighbor's windows, it has been a pretty rough go. You will probably get the idea by now that he has been a pretty rough character. Oh, I don't know—I guess he wasn't much different than any other growing boy. Anyway, it was worth it.

You see it hasn't been without its recompense, because that guy is the best darn fishing and hunting partner I ever had and you can bet I was pretty proud when he grounded a six point buck the first time out. And if you want to know something about automobile engines and hot rods, he's your man. Yes sir! There's a man in my house and a real guy at that.

You got a man in your house? Oh, I know that he may be grown up and out on his own or maybe he is just a little guy. Doesn't make much difference though, he's still the man in your house and you love him don't you? Wouldn't trade him for anything in all the world.

Yes, I've got a man in my house and you've got a man in your house, but did you ever stop to think that there's a man in every house all over the world? A man that's just as important and dear to someone somewhere as that man of ours is to us? And who are these men in all the houses all over the world? Well I'll tell you, they are the fellow next door, and the one down the street. You will find them in New York and Chicago, in Albuquerque and Ann Arbor. In fact, you will find them wherever you go. But more especially you will find them coming in to work for you everyday. Men just like you and me, who are trying to make a living, be good citizens and enjoy their inherent rights as right living Americans.

What we are really driving at when we ask, "Why is safety so important?" is simply that human life is sacred and it is our business as industrial leaders to handle it accordingly.

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