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PUBLIC UTILITIES SESSIONS

CONTENTS

SERGEANT! DON'T TAKE ANY PRISONERS!

By WILEY I. BEAVERS
Vice Pres., Mountain Fuel Supply Co., Salt Lake City, Utah

Two years ago I was assigned our company's safety operation. I approached this assignment with all the enthusiasm I normally reserve for life insurance salesmen and my wife's list of chores that need doing around the house. Although I had had considerable contact with our safety function over the years, I understood it about as well as I comprehend the principles of nuclear fission—principles which I don't even believe, let alone understand. However, in spite of my lack of empathy for the safety function, I was also a promising young executive—by that I mean I would promise anybody anything—and I was determined to show our management what a wise choice they had made.

I made a personal study of what a new safety man should do to make a big splash at the beginning—to show he is really a hard-charger. My superficial research revealed that the first thing you do is put up bright-colored posters all over the company.

If you're a real gunner, you go further and decide what safety problem the posters should attack. If you're something of an administrator, you make arrangements to have the posters changed once in awhile. If you wish to demonstrate your P.R. talents to management, you also make a deal to unload the used posters on the local high school as a public service.

Well, I wanted to demonstrate how talented I was in everything so I began my career by looking for a safety problem. This wasn't easy because our operation had had a great year—one of our high-risk divisions even had a no-disabling-accident year. (I learned something else from this belatedly and to my sorrow: a safety man is like a football coach—never hire out to a school which has just had a no-loss year.)

Suddenly, I found the ideal problem to tackle. Safety hadn't done too much with our general office, and I had noticed a growing incidence of broken and split fingernails. Because of not trimming these nails immediately, work suffered and errors rose along with the attendant suffering and dangers of accidents and infection. (My own secretary even stapled an important letter to her thumbnail!)

To my surprise, there were no safety posters available for this. I carefully checked the National Safety Council's *Accident Prevention Manual*. In this manual I could find no mention of the fingernail problem. Eureka! I had come up with something new in the safety profession!

To demonstrate my shrewdness further, I didn't want to spend money on nail clippers for employees, so I developed a do-it-yourself program; I asked our director of safety and training, who is also a talented cartoonist, to draw a poster—a sketch of person biting nails: "Rid our company of ragged fingernails—Do It Yourself—Today!" I distributed this poster all over the system—after all, a welder could suffer as much as an accountant.

The campaign was a fantastic success! Our first aid reports of fingernail injuries dropped to zero within three months.

But then some after effects set in which I had not figured on, something I'm sure only happens to new safety men. First, I noticed a tendency of people to put their hands behind their backs when talking to me. Far more serious, employees began to complain of their front teeth wearing down at an alarming rate! Supervisors reported that when they disciplined employees, they were unable to get any grip at all. In my darkest hour, I realized I had to reverse the program in a hurry. So, I designed another poster, this one a sketch of an employee taking his finger out of his mouth: "Get Your Finger Out!"

To add insult to injury, our president indicated that he found my performance somewhat underwhelming, or words to that effect. He also made some remarks which, coming from anyone else, I would have considered ridiculous—coming from my boss, I considered them absolutely hair-raising.

He said things like, "We're spending $100,000 per year for our safety operation. What are we getting for it?" I quickly answered with, "How much is a human life worth?" And that was a mistake. He said, "Don't give me that baloney! The worth of a human life is an important philosophical question, but when it's used in industry, the purpose is usually to cover up some poorly thought out, expensive, ineffective operation. I don't think you can show me where we've even prevented a blister, let alone saved a life!

"Now, listen to me, and listen hard. One of the main purposes of our company—or any company—is to provide good jobs for people who are willing to do their share. A second *critical* purpose is to insure the physical safety of these people so they can continue to benefit from their work.

"I want you to figure out how safety should carry out this second purpose—what it should do, how it can do it, and how we'll know whether it actually did it!

"Now get busy! And one thing more: that safety poster that says, "Gas Line Gus says, 'Wear your goggles when you weld!' Get that poster the hell off the General Office bulletin board!"

At this point I began to take a real interest in safety, and to give it some thought. Like the man said, "I just never had anybody explain it that way before!" In desperation, I even made what for a Vice President is a stunning breakthrough in concept; I went so far as to discuss our safety program with our safety people.

After some hours of sweating, sometimes heated discussion, certain inescapable conclusions began to surface.

Our first conclusion was this: The purpose of the safety function is the physical well-being of our employees. This is a broad assignment but the wording is deliberate, as you will see later.

To accomplish this purpose—the physical well-being of our employees—I believe only one conclusion can be drawn: the safety man must be a manager—a manager in the truest sense of the word. He is not a chameleon-like staff advisor who can receive kudos when the accident rate is low, and share the responsibility when frequency soars. While every supervisor and, hopefully, every employee must be vitally interested in safety, I think that time-worn slogan "Everyone is a safety man!" is a bunch of horse feathers and is mainly used as a copout by safety departments.

Lawd! We say to the poor, damned foreman: "You're the production man! You're the cost man! You're the public relations man! You're the consumer satisfaction man! You're the employee relations man! You're the safety man!" Then, in heavy, portentous tones that are a cross between those of a general awarding a medal for valor, and a doctor predicting certain death, we say, "You see, old man, if you don't get it done, it won't be done!"

Well, that foreman is not a mixture of Vince Lombardi, Peter Drucker, and the Israeli airforce. He can't be skilled and competent in all these assignments, and neither can we. If he was, everyone of us would be looking for a job.

Surely he is answerable for his safety record, but only as a part of his job. As our safety men tell our foremen, "Safety is a part of your job, but it's the only job I've got!"

The safety man is the only guy in his company who has been assigned the *full*-time responsibility for the safety of our employees!

On the other end, the safety man's boss—a president, a vice-president, a plant manager, whatever—is ultimately accountable for the safety results, but only the safety man has the skill, the intelligence, the expertise to make them happen.

I'll admit some good safety programs have foundered on the stupidity of a vice-president, but I would argue, perhaps in self defense, that far more have gone down the tube because the safety man lacked the conviction and the skill to sell them, or the guts to keep coming back and fighting for what he believed was right!

Sometimes we sit on our rumps and mutter, "Why doesn't the boss ask me to tackle this project, or design that kind of program?" Why the hell should he? He doesn't know anything about it!

Now, this foaming tirade doesn't just apply to safety men, it applies to all managers in our companies.

Back to my point. The safety man is a manager—he manages the company's function which is responsible for the physical

well-being of our employees. As a manager, the safety manager should plan carefully and set his objectives before he acts. The process I recommend is called "management-by-objectives," or MBO. It is a simple process, but it is difficult to do because we are forced to analyze our operations, determine what objectives really mean something, which ones are laudable but can't be measured, and which ones are just plain garbage.

For example, if we set an objective to distribute one new safety poster or booklet each month, this is garbage unless we can prove what it accomplishes.

Or, suppose we set an objective which says, "Improve the image of our company's safety operation in the eyes of the community." A splendid objective, but unless we are willing to run a community attitude survey at the first of the year, and another at the end of the year, how do we know and how can we show whether we accomplished this objective or not?

Management-by-objectives requires lots of plain old common sense. For instance, suppose we are concerned about our vehicle accidents and we set an objective of no vehicle accidents for 1971. We know cotton-picking well that the only way we can succeed is if no one drives a vehicle. While this might work okay for us, it does present some of our other departments with a few problems.

Our objectives must be simple, make sense, and be measureable. We do not fire a buckshot load of objectives against a barn hoping to hit something; each objective must be a gut shot.

Management-by-Objectives Process

Here's the process, step by step:

1. State our purpose.

2. State our objectives which will accomplish this purpose.

3. Select the measurements which will show whether we met our objectives.

4. Decide how we will carry out each objective.

There are numerous methods for MBO. I'll show you the method we use in Mountain Fuel because it is simplified to the point that even I can understand it.

1. State our purpose—the physical well-being of our employees. We take this broad purpose and break it down. What is our most obvious indicator of physical well-being? The indicator on which we already have good records? We decided on number of accidents. I'll explain why we use only number of accidents in a minute. At this point we need a few statistics. What was our 1969 record? What should and could be improved? In our 1969 report, here's what we see:

1. No fatalities: Great! Let's keep it that way.

2. Disabling accidents—6 for 1,300 people, pretty low. Improve it or try to hold our own?

3. Non-disabling accidents—139. Should be improved.

4. Vehicle accidents—61. Should be improved.

At this point we may want to go back five or ten years to study trends and cycles. We didn't, because our record-keeping methods made this very difficult. Particularly on a departmental basis, it could be misleading. We have since redesigned our control reporting to give us simple, accurate data.

So now our safety function decided our number one objective should be:

Objective Number One: Reduce vehicle accidents by 20 per cent.

Our reasons ran like this: Our vehicle accidents are too high. Vehicle accidents, in our case, ricochet against disabling and non-disabling accidents, and could affect fatalities.

Further, we already have a hard measure for this objective. At the end of the year it will be clear to us, and to everyone else, whether we did the job or not.

Finally, and very important, the objective is tough enough to stretch us hard, but it isn't unreasonable.

Objective Number Two: Reduce number of industrial accidents by 10 per cent.

For this our reasons were: We wanted to reduce the number of people hurt, but we felt a large reduction was unrealistic. We also wanted to reduce severity, but the argument over the slim line dividing many disabling and non-disabling accidents nearly resulted in some disabling accidents within our department.

Since we had only six disabling injuries for the year, a 10 per cent reduction would be .6, which didn't look like too big a deal. We also felt a 10 per cent overall was a reasonably tough target in view of our previous safety record. Because of time, I won't go into more of our objectives such as cross-training safety supervisors and reducing home accidents.

Thus far we have established our purpose, set our objectives and measurements. This brings us to the last step—how do we carry out the objectives?

A study of our 1969 vehicle accidents indicated accidents of all kinds, no real pattern. Conclusion: bad driving habits. Solution: driver training.

We had done some experimenting with the National Safety Council's Defensive Driving Course in one of our divisions and the results looked promising. We decided to put on this course for all company drivers up to and including company officers. Our vehicle accidents immediately took a sharp drop in January of this year. You'll be interested to know that we didn't start the Defensive Drivers' Course until February.

For our 10 per cent reduction in industrial accidents, a study of our departments revealed several units of comparable size and work assignments in which one department would have a much larger number of accidents than another. For instance, one unit had 17 accidents, while a similar one had seven.

Instead of broadsiding the whole company, we have concentrated on our higher incidence units. (Of course, our standard maintenance programs were continued.) In one division with a high accident frequency, about 10 per cent of those injured were supervisors. So we concentrated on the supervisors. Comparing the end of September, 1969, with 1970, the industrial accidents in this unit have been reduced from 10 to five.

(We have had two cases in which autocratic managers called in their employees and growled, "There ain't gonna be no more God-damned accidents this year!" And the accidents have stopped! Because our safety and personnel people travel our units constantly, we know for sure that no accidents have been covered up. What is driving us ape is trying to figure out how to incorporate this factor in implementing our safety objectives.)

There is another advantage to this planning—we end up with the information we need to do some realistic budgeting for the year.

Now, this is most important. To control our objectives, we have to have accurate, regular progress reports. At this point I have to eat a large plate of rancid crow—our situation at the end of September makes the case for progress reports, but not in the way I expected when I began drafting this presentation. Coming into July and August, we looked great. I could hardly wait to brag about it. Then came our September report: As of this date last year, total accidents were 103. This year they are 104.

We can still make our objective for the year; but it is going to take some fast, hard work. Right now our safety men are concentrating on the units where accidents increased in September. They are analyzing what caused this increase and what we should do about it.

Our vehicle accidents stand at a 27 per cent reduction as of the end of September. Some loss over August, but still not out of control.

As I mentioned earlier, we set objectives with numbers instead of using frequency and severity rates. Frequency and severity rates are valuable for national reporting, and we keep these religiously. But, I do not feel these rates are good MBO control figures. They are too vulnerable to skewing, and are not readily understood by those outside the safety profession.

We have not used dollars as a measurement because of different ways the various states handle insurance costs. However, we're analyzing these now to see if these costs can be compiled on a usable basis.

This is management-by-objectives—a capsulized version of a tool to help you manage. It is stating our purpose, stating the objectives to carry out our purpose, selecting our performance measurements, and deciding how we will accomplish our objectives.

It requires a realistic knowledge of our field, common sense, and stern self-discipline. You should understand too that when you use MBO, you will find it a harsh, unrelenting taskmaster.

I would suggest two cautions:

1. Set very few objectives. Most MBO systems get into trouble because of setting too many objectives. For your first time, set two or three objectives at most.

2. Keep a running analysis of your results and be flexible. You may add an objective during the year; perhaps vehicle accidents were not one of your objectives, but they take a sudden surge.

You may drop or alter an objective. Suppose your objectives involved dog bites, and your company goes to bi-monthly meter reading; or the secretaries are suffering scratched knees, and—the Saints preserve us from it—the maxi dress catches on.

To conclude, I want to mention briefly where I think the safety field must go—in fact, where it should already be.

I believe that the purpose for the safety profession must be the physical well-being of our employees—that we have no other reason for existence. This being the case, here are some areas which we have not touched, areas in which we have rejected any responsibility on our part.

For example: During the past three years of soaring crime, violence, and destruction, how many of us have developed plans for protecting our employees? Regardless of how our companies are structured, the physical security of our employees is our responsibility. This is not a recommendation to seize your security department, if you have one. I'm saying we're involved in all security activities which affect our employees, the same as when one of our collectors is robbed and beaten.

About a month ago, a student called our office and told the operator he wanted to speak to the person who could tell him what our policy on pollution is. The operator immediately connected him with our safety director. The call was later switched to our public relations department. I asked our operator why she put the call through to Safety, and she answered: "The safety department works hard to protect employees, and this pollution is dangerous to us, so I figured Safety would be handling it."

And she's right! But how many safety men have prepared programs to combat pollution and presented them to management? Safety has the expertise and mental approach to do the job. But we give in hard—it was only in the last five years that we would accept any responsibility for noise control—noise pollution.

And consumerism: I know that in the gas industry most safety departments have done nothing but bitch like hell about the Pipeline Safety Act—when we know there are shoddy operators in the field! What with brownouts and a few other goodies, I'm sure the electrics have some comparable situations to challenge their safety functions.

It is obvious that to carry out our present and future responsibilities, we must have the determination, the optimism, and the willingness to do the job, a combination exemplified by the title of my speech: "Sergeant! Don't Take Any Prisoners!"—General Custer's last words at the battle of the Little Bighorn.

OPERATION SWOBI

By JAMES V. FEAHR
General Safety Supervisor, Consumers Power Co., Jackson, Mich.

We have had our share of personal injuries at Consumers Power Company. Employees are constantly involved in the handling and application of volatile and powerful forms of energy: improperly handled, this can be a high risk area. Not only that, but add to the fact that we operate a fleet composed of over 4,000 vehicles and drive a total of over 50,000,000 miles per year, and you can see that traffic accidents can also be a great source of headache to us.

Naturally, we try almost any idea that has the slightest possibility of working in the safety area. But as you well know, the only means of accomplishing a safe job is having adequately trained people under the direction of adequate supervisors, under an adequate set of management tools. At the end of 1965 we had decided that the areas in which our company were deficient were the areas of work observation, job briefing, and regular inspections. It was decided that in an attempt to instill the concepts of work observation, briefing, and inspection, a movie would be made and shown to all employees, both operational and supervisory, for a kick-off of the year 1966.

The areas of work observation, briefing, and inspection were pretty well laid out to all the employees in 1966. In the movie the company president said, "Indeed, I consider adequate attention to safety to be a condition of employment at Consumers Power Company, and I mean for all personnel without exception. . . . We must get back to fundamentals; we must involve ourselves in all-out safety consciousness; we need substantial improvement; we have a realistic goal; let's match our best performance; we can do it if we put three basic tools to work. These tools are safety briefing, safety observation and safety inspection."

With these instructions in mind, the 20 operating divisions of Consumers Power Company started their own local safe work, observation, briefing, and inspection programs. In order to check their progress, and perhaps help them get their program off the ground, the General Safety Department decided to hit the divisions with spectacularly uniformed teams from the general office.

The teams visiting the divisions are called SWOBI teams. These letters stand for Safety Work Observation, Briefing, and Inspection. Depending upon the type of service engaged in by the division, the teams may be composed as follows: A gas team, an electric team, a customer service team, and a buildings, stores and transportation team. Each team is composed of three members, one member from General Safety Department, one from the Functional Department, and one supervisor from the local area being inspected.

The team is distinctively garbed in white coveralls with red and blue embroidery on the back. The hard hats are white with brilliant orange bands, the company insignia, and the word "safety" inscribed upon the front.

The team arrives unannounced at the division manager's invitation, usually at 8:00 A.M., equips the local team members with uniforms, gives them a briefing on how the operation will be run, and very shortly thereafter the team will be visiting the various locations such as the local buildings and physical facilities, the local highways and byways, residential areas, business areas, and most any site where company crews may be working.

The functional people are usually on a departmental manager's level and even the vice president in charge of personnel and safety is out on the job site. The crews visited are at first somewhat suspicious; but when you tell them the reason you are visiting them, the suspicion fast disappears and they are, instead, delighted to find someone from the General Office, as well as their own supervisor, taking the time to be interested in their welfare.

Many tools are inspected and found to be defective. For example, we find measuring tapes on electric line vehicles to be conductive, chains are found to be stretched and deteriorated, and hooks and couplings are found to be stretched and cracked.

Many tools with wooden handles are found to be in a deplorable condition with handles loose or cracked, and sometimes shimmed up and tightened into the metal head with the oddest material. Many impact tools are found that have mushroomed heads and are in need of attention.

Power-driven winches have been a big offender, with cases of pinched cable and frayed connections.

No portion of the visited crew's equipment is sacred, and the teams root into every and all nook and cranny, seeking any items that may sometime cause a lost-time injury.

Seat belts are one of the specific items checked in each vehicle and in some cases are found to be used very regularly and in good condition, while others are found to be pushed back under the seats and dirty, and never have been used or, in some cases, having hung outside of the door for so long a period of time as to be practically severed from whipping in the wind. It is our estimate that seat belt usage runs from 15-25 per cent.

The SWOBI teams are, of course, always on the lookout for items of housekeeping, and are quick to note when the housekeeping is either good or bad.

Meanwhile, back at the office buildings, SWOBI teams are checking the physical properties, with a particular emphasis upon the office and technical personnel who work in the office areas and in many cases are not included in our safety activities because the possibility of their being injured is very slight. We note that they, too, are pleased that someone is paying attention to them and are swift to cooperate and make many suggestions for improvement in the overall safety program.

The SWOBI teams return to service headquarters just before the crews are scheduled to return and proceed to check the vehicles into the yard. Of course, in a hit-and-run operation such as this it is not possible to visit every crew out on the job and, to make the maximum impact, most of those that were missed on the job site are given a quick check as they return to the yard. It is surprising that even though we have been there for the entire day, and these people are in communication by radio, many of them are still surprised and shocked to find the teams waiting for them at the gate. Many of them, upon seeing the uniformed teams waiting, will swerve and attempt to enter another gate, hoping to miss whatever is waiting in store for them; but of course, with the number of teams available, each gate is covered and they are soon captured.

When the vehicles are all checked into the yard, the SWOBI teams then closet themselves in a room and proceed to compile the results of the day's inspection. The teams compile all of the information they have noted during the day on one combined report form, and the team member from the Functional Department is selected to make the presentation to the division manager.

When the division manager and his staff and whichever of his supervisors he desires to be present, walk into the room, they find the entire SWOBI team arrayed at the head table waiting to report the day's activities. Every detail is given to the division manager and his people at this time, and at the conclusion of his report the Functional Manager turns over all the working papers from the team for that day to the division manager. In this way, the division manager knows there will be no written reports circulated through the General Office waiting to entrap him at a later date, but instead he has been appraised of the situation in his division and can take steps to correct any problems immediately.

The SWOBI program is not designed to supplant in any way the first-line supervisor out on the job. It is, instead, designed to assist him in his daily program of safety work observation, briefing, and inspection. The supervisors that we have talked to following the SWOBI team visits have been enthusiastic in the extreme.

The functional supervision from the General Office have been delighted to accompany the teams into the field, and in many cases have been surprised to find that there are real people working with the company outside of the ivory towers. They have commented that they have returned to their jobs with a better feeling for the problems encountered by the operational personnel in the field.

I might mention that we always alert the local newspapers, radio, and TV, and because of the spectacular impact of the SWOBI team inspection the publicity is always good; this naturally appeals to the local division manager.

While at first glance you might be inclined to say that the teams are doing nothing more than nit-picking, looking for small, inconsequential violations and items, I must insist that in many cases serious infractions have been noted and immediately corrected by the supervisor on the team from the local division. And neither can we dismiss the impact upon the personnel who undergo an inspection by this team. I must admit that in many respects Operation SWOBI will be termed promotional, but it is my feeling that safety to a great extent depends upon promotion for its success.

Certainly on all occasions it has been a wonderful opportunity to go out into the field and talk to the personnel involved and talk safety in a very congenial and interest-provoking atmosphere.

You may ask, after all the dust has settled, did Operation SWOBI work? I guess this is a hard question for me to answer and probably your guess is as good as mine. The results have to speak for themselves.

In 1966, the year SWOBI was started, our frequency rate rose slightly to 3.78. Because safety is my responsibility, I was quick to point out to my boss that during 1967 the frequency rate dropped to 2.86. Needless to say, I have not reminded him that there has been a slight rise since. Of course, this follows an industry wide trend and could still be termed a fairly creditable rate.

In 1966 there was an increase in the severity rate, followed by a satisfactory drop in 1967 and further decrease in 1968. Then there was an upward jump to 730 in 1969.

Again, I can only repeat to you that I really can't guarantee results from a program of this type but I can guarantee to you that the practice of the concepts of Work Observation, Briefing and Inspection cannot help but improve the operation in any type of business. As a safety man, I know that presenting the safety story in a new manner is a job that needs our constant attention. I also know that many times we feel that most everything under the sun has been attempted some time or other, but I would suggest that, as the boys on Madison Avenue know, if you want to sell soap you have to advertise it, and I believe it is up to us to take a page from their manual and use whatever innovation we can in order to sell the safety story.

Your employees are looking for the unique and the different, and an effort on your part to garnish their safety activities with a little flair and excitement cannot help but make the safety story more palatable.

Presenting the safety story will become more difficult in the years ahead of us, but regardless of what your job title may be, I hereby appoint each and every one of you as safety supervisor at your particular company and wish you the best of luck in the future.

THE HIDDEN SAVINGS OF AN EFFECTIVE SAFETY PROGRAM

By DONALD H. MARSHALL
Safety Administrator, St. Louis County Water Co., University City, Mo.

Since there are admittedly "hidden" costs in having industrial accidents, then surely there are some hidden savings in preventing accidents, and management must be appraised of the tremendous amounts of money to be realized from having an effective safety program.

Operating under today's workmen's compensation laws, management is certainly aware of the costs of paying compensation, whether it is through an insurance company or direct. The costs of medical attention for injured employees, including doctors' fees and hospital bills, are usually well known to management. These payments are part of the cost of doing business, they feel, and must be put in the budget if a company is to continue to do business. Yet, the managements of many companies would be appalled to have spelled out for them some of the hidden costs of accidents which they must absorb and which are likewise the cost of doing business.

To properly set the stage, hidden costs are sometimes called indirect costs or uninsured costs. These costs are simply costs that do not show on an accountant's ledger sheets and are difficult to separate from the many items of expense absolutely necessary to carry on a business.

What are some of the hidden or uninsured costs of accidents? To help detail some of these costs it will be useful to select a specific type of business so that terminology will relate to that business and be more meaningful.

A large water utility doing business in a metropolitan area does all of its own work of installing mains and maintaining them, plus the installation of water meters, the reading of the meters, and maintenance work at all locations. Clerical personnel take care of the billing and collecting and all other paper work involved. Employment totals about 450 with some 200 of these in construction or maintenance work, mostly outside. This firm's frequency rate averages about 30, not untypical of large-size water utilities in this country.

A typical accident among the outside workers—where most of the accidents of any consequence occur—involves only a minor injury. A good example is an equipment helper working with a trenching machine on a water main installation job. While working around the machine, he notices a piece of 2x4 near the machine and picks it up to move it safely out of the way. His grip on the piece of wood is not very firm because he grabbed it quickly in order not to be near the trencher very long and didn't feel it was necessary to stop the operation of the equipment. He slips, the 2x4 gets caught in the bull wheel of the trencher and jams the board against the wrist of the worker, resulting in a serious sprain.

The workman is taken by the foreman to a nearby medical center in a company crew truck, because his wrist prevented him from driving. The doctor's fee for examining and bandaging the wrist was $20, and the employee will not be able to use the wrist to do his type of work for five days. Insurance will take care of this.

But when the accident happened, the foreman and five other employees, plus the equipment operator, stopped working for 15 minutes to give aid to the injured and to find out what happened. For another 15 minutes, while the remainder of the crew starts back to work, they continue to talk about how much more serious it could have been and how stupid the workman acted in letting the 2x4 fall into the equipment. The foreman is away from the job an hour taking the injured to the medical center, waiting, and returning. While he is away, the other workmen have an extra smoke, a sip of coffee from their thermos bottles, and spend a little time around the fire. Actually, the whole crew lost about an hour at an average hidden cost of about $3.70 an hour, including the foreman. In addition, the injured man will be paid for the entire day although his services will not be available.

Meanwhile, the equipment operator finds that the 2x4 jammed into the machine has broken a part necessary to the operation of the equipment. It requires two hours for a maintenance man, at $3.40 an hour, to come out and weld the part on the $18,000 trencher. The actual cost of the weld was only three dollars, but the equipment was idle for two hours, and this also holds up five other men installing the water main. Total production time lost, so far, is three hours times eight men, or 24 hours. When the new equipment helper reports for work, same day, he wants to know what happened, so most of the crew spends a little time filling him in on the details, and there is a small argument over whether the injured workman's foot slipped or he just lost his balance. The new equipment helper is not totally familiar with the new job, and for the first four hours he works at about 50 per cent efficiency. This holds up the trencher and this, in turn, holds up the remainder of the crew. Knowing that an accident has just happened, the helper works under a further handicap and possible inefficiency for more than four hours.

The foreman spends 15 minutes training the new equipment helper, 15 minutes filling out the accident report and doctor's visit slip, 15 minutes on the radio calling for the maintenance man to fix the equipment, calling for another helper, and calling for some rescheduling of work.

The water main on which the crew is working must be in service before the end of the week, so three hours of overtime are needed to get back on schedule.

Back at the office, a supervisor spends 15 minutes going over the accident report, a clerk spends 15 minutes typing up the necessary forms, the safety director spends 15 minutes examining the accident report and making further records of the incident. The construction supervisor has taken time to read the accident report and sign it.

When the injured workman returns to work, all of his crew welcome him back on the job, examine his wrist and want to know if the nurse was cute. Then they ask him if he knows that a 2x4 won't "fit" into the bull wheel of a trencher. Since the injured helper tends to favor his sprained wrist, his efficiency is reduced and thereby reduces the production speed of the entire crew.

In this accident, we will disregard these possible hidden cost items:

1. Cost of hiring another employee.
2. Cost of personnel paperwork, shifting workmen around on time sheets and figuring overtime.
3. Cost of printed forms for reporting accidents.
4. Cost of the company crew truck being out of service for an hour.
5. Cost of sick leave pay for the three-day waiting period.
6. And according to the American Water Works Association 1957 *Safety Manual*, "There are at least 100 other specific items which may be directly charged against any particular accident."

The direct or insured cost of this accident would amount to about $134 including the medical attention and workmen's compensation.

But the estimate of uninsured or hidden costs of this accident could easily amount to $350. If we total these two figures we have an estimate of $484 for this one thoughtless accident that could have been prevented.

Now, let's assume that an effective safety program had been organized in this company at a cost of $5,000 per year, or about $10 per employee, and that a general safety awareness had been instilled in all employees. The proper procedure in this case would have been to stop the trenching machine for thirty seconds so that the 2x4 could have been removed without incident.

Based on this typical accident, the hidden savings for this water utility would have been $474, subtracting the $10 for the individual cost of accident prevention. Even without adding the hidden costs, the company would have been farther ahead to have the safety program than to pay the workmen's compensation and medical costs involved.

While this accident may not be entirely typical—overtime work, etc.—some accidents cause considerably more in insured costs and greatly increased amounts in uninsured or hidden costs.

Many industries use the famous 4:1 ratio for the relationship of uninsured to insured losses in job injuries. This means that for every dollar of obvious or insured loss there

are about four more dollars of hidden losses that management is usually not aware of.

Quoting from a bulletin of the United States Fidelity and Guaranty Company: "Based on country-wide averages, for every dollar paid by the insurance company for compensation losses and medical expenses, the employer pays four dollars for the same accident."

Referring to the 1963 edition of *Safety Management:* "With the exception of the National Safety Council, which has replaced the 4:1 ratio with the Simonds method for finding a company's accident cost, many books on accident prevention still repeat the story of the 4:1 ratio." Some conservative authors feel this ratio is a bit too high, as for example the 1967 edition of *Supervisor's Safety Manual* (National Safety Council) which states: "What is not realized is that the hidden costs of accidents are higher than medical, compensation, and insurance costs. The rule-of-thumb figure is that hidden costs are about twice the direct cost of an accident."

(For comparison purposes, the Simonds method of determining the hidden costs of accidents assigns specific dollar figures for uninsured costs for various industries. The all-industry group has an average uninsured cost of $130 per lost-time case, while in construction the cost is about $100 per lost-time case. It is interesting to note in the Simonds studies of no-injury accidents—property damage only—that the average uninsured cost for all-industry was $290 and for general manufacturing was $375. No-injury accidents—no injury to employees—are said by many experts to occur about as often as lost-time injuries.)

The case is clear for accident prevention. There are thousands of dollars of hidden savings to be gained by all types of industry, as well as a large water utility. The hidden costs of accidents have been studied by many for years, including A. H. Young of U. S. Steel, who as early as 1936 stated: "We have spent $24,860,000 on safety work . . . by multiplying the cost of settling similar accidents, we found that we had made a saving of $117,224,000 . . . even if the figures are 50 per cent wrong, at least we got back the dollar we paid for safety and another with it."

The National Safety Council 1967 edition of *Accident Facts* reports that during 1966 in the United States the "other costs of work injury accidents" amounted to $3,000,000,000, which included property damage, interference with production, and time lost by workers other than the injured, while the cost of medical expenses and insurance costs totaled only $1,500,000,000. Again, the hidden costs or hidden savings available were twice as much as the insured costs of an accident.

As a closing thought, another quote from the National Safety Council's *Supervisor's Safety Manual* should be sufficient: "Property damage is one of these hidden costs. Often an accident occurs which injures no one (or in which the injury is slight), but which does extensive property damage. Because the repair bill was charged to maintenance and repair of equipment, it never appeared in the accident reports to management. Yet it was an accident cost just as surely as compensation paid to an injured worker would be. Management must recognize this."

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