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Glass & Ceramics Sessions

COPING WITH INSIDIOUS ACCIDENTS IN A FIBERGLAS PLANT

By F.S. MILLIGAN
Personnel Mgr., Owens-Corning Fiberglas Corp., Ashton, R. I.

I have been coping with insidious accidents for over three decades at the Ashton plant of Owens-Corning Fiberglas Corp. The Ashton plant manufactures fibrous glass yarns, reinforcing rovings, and glass marbles. Our product goes mostly into textile and industrial uses with our primary customers being paper manufacturers who use our yarns for reinforcements.

Our physical plant is over one hundred years old, having been built during the Civil War. Owens-Corning acquired it in 1941 for manufacturing of fiberglas textiles. This makes Ashton the oldest fiberglas textile mill in the world.

Over the years, our accident frequency and severity rates have been fairly low and quite satisfactory. We have never had a total disability case. In 1970, we were charged with our only industrial death.

What are insidious accidents? Too often speakers go to the dictionary and pad their talks with what Noah Webster says a word means. In our case we will just take one word—the Latin word *insidiosus* meaning ambush, from which *insidious* is derived. And that is just what these little devils are—accidents just laying in ambush awaiting the opportunity to pounce upon the unwary.

And we must face up to the fact that our people are unwary. Not only are many of them unwary, many of them seem to go out of their way to get hurt. The unusual and ingenious ways some of our people find to get hurt continue to confound us. If there are 10 obvious ways to do something safely, some employee will seemingly seek out and find the one way to do it unsafely.

With all our safety protective guards and devices, people continue to injure themselves, and in many various and bizarre ways. In many cases, they fall into the insidious—the

ambush. What have some of these been in my plant? Without researching or going back in our records, these are a few that come to mind:

An electrician was replacing an outdoor light bulb and was stung in the eye by a bee.

Our vehicle man was stung in the ear when he opened the hood of a company car.

An employee lost five months work. His injury? He sprained his back lifting a pin from the floor. What is a pin? It is a two-ounce paper tube.

An employee was struck in the back of his hand, lacerating it and cutting a blood vessel, by a metal particle. The source of the particle was a chip which flew 50 feet from where the injured employee was walking.

An employee was struck in the shoulder by a falling carton. Two days later, the vision in one eye became blurred. Two days later, the employee was in surgery for a detached retina.

An employee sneezed, and involuntarily his head snapped downward and he hit his mouth on a creel he was repairing. Result: two broken front teeth.

On February 6 an employee stepped down from a one step platform and twisted his ankle. On March 27, the same employee stepped down from the same platform and twisted the same ankle. By the way, what happened to that old expression "accident prone"?

Akin to the accident in my plant when an employee was injured by the metal particle which flew 50 feet was one that happened in August on Block Island, Rhode Island. This brief news item appeared in the August 6 issue of the Pawtucket, (R.I.) Times:

WORKER KILLED AT BLOCK ISLAND—A 24 year-old New Jersey man was killed when he was struck by a metal shackle

that was thrown from a nylon line which snapped as it lifted a mini-submarine from Old Harbor. George C. Hess of Union, an employee of a transatlantic cable repair company, died Saturday night. Authorities said Hess, who was standing on a workshop, was part of a crew conducting an exercise next to the jetty wall in Old Harbor when the heavy piece of metal was thrown about 35 feet and struck him.

This accident hasn't happened yet in my plant, but I fear one of these days one of my employees is going to bump into something and break his nose while reading all the safety signs and markings we've been directed by OSHA to put up on the walls, ceilings, and floors.

Accidents in themselves, by their very nature, are insidious. We all know, an accident is an accident whether or not anyone is injured. If each of four men slips on an oil spot, one may recover his balance, one may fall and only dirty his trousers, one may cut his arm, and one may fracture his skull. Although the results differ widely, and only two of the four men are hurt, these are identical accidents. It is the accident itself which determines the need for investigation and corrective action.

I don't think any of us, as sophisticated and scientific as we may try to become in this overall field of safety, ever entirely discounts a slight element of luck. In the case of the aforementioned four men, were two men lucky and two unlucky? The difference between a scratch and a severe gash can be a matter of a fraction of an inch. When the injury is a scratch, the employee considers himself lucky to have avoided serious injury, and to a degree, he's right.

"There's always some luck involved in avoiding an accident in the first place or, barring that, in avoiding painful or disabling consequences," declares Frank Valek, safety supervisor, Allentown (Pa.) Works, Western Electric Co., Inc.

But the dependence on luck can be minimized. And it will be, Valek says, if both management and employees are truly determined to make safety a way of life both on and off the job: "Management must develop and implement an all-encompassing acci-

dent/injury prevention program that's technologically sophisticated. The people who implement the program must have clear-cut authority over every safety factor, receive accurate, continuing 'source' material from operating personnel, and pass on any information that helps boost safety consciousness."

The employee? His job is never to let up, says Valek, to achieve a good record and then to better it. There's no room in safety for resting on laurels.

"All the rhetoric in the world can't prevent on-the-job accidents—only employees can," asserts Jack R. Shirey, Superintendent, Union Railroad Co., East Pittsburgh, Pa. "Therefore, an effective safety program has to 'hit the human element.' It has to keep every worker alert to potentially hazardous situations every working minute."

The founder and first president of Owens-Corning Fiberglas was the late Harold Bochenstein. Beck, as he was fondly called, sincerely believed in an axiom he frequently quoted, which was, "More than anything else, people make a business." No one can hardly disagree with that statement.

And hardly anyone can disagree with a paraphrase of that axiom: "More than anything else, people make an effective safety program." The human element is there in the forefront, the effect of the human element cannot be minimized.

Statisticians and records indicate that as much as 90 per cent of all accidents are related to hazardous actions by employees, that the overwhelming majority of accidents are caused by unsafe acts, not by unsafe conditions.

The best safety program, the latest in sophisticated safety devices, or an all-encompassing communications program can't prevent on-the-job accidents. On-the-job accidents can only be prevented by the employee on the job. I understand our part, such as correcting accident-producing physical conditions and minimizing unsafe acts, but we cannot overlook nor even minimize the human element. Over the past several years all of us in industry have pulled out all the stops to meet federal safety standards as set down in OSHA. There can be no doubt that our efforts to meet these standards have and

ical conditions and stresses inherent to work. I am concentrating my remarks towards the behavioral.

Manufacturers have always designed a certain degree of safety into their products. Certainly their efforts have accelerated in this regard since the passage of OSHA a few years ago. They know their products must be designed so they're safe when used for the purpose intended. But the product does not have to be so foolproof that the user cannot be injured no matter how hard he tries.

Employees, as I have said, manage to injure themselves by ingenious methods and means. We have all had incidents where the employee has been hurt by ingenious methods: elaborate by-passing of safety switches, working out short cut work procedures and methods which would make an industrial engineer proud, were it not for the safety short cuts and the like.

People do things for which there is no rhyme nor reason. They do things and get hurt in ways that we have not warned them about nor given instructions nor training because the matter was so simple or so obvious. On such a case a judge ruled: "We hardly believe it is anymore necessary to tell an experienced factory worker that he should not put his hand into a machine that is at that moment breaking glass than it would be necessary to tell a zookeeper to keep his head out of a hippopotamus' mouth."

While lack of safety devices can constitute a defective design and be illegal, this rule usually only applies where the absence of the safety device could cause an accident in the normal use of the product. Of course, now OSHA could very well make an employer use safety devices on equipment that its manufacturer did not provide.

Sometimes, an insidious accident turns out not to be an insidious accident at all, but is just an out and out fraudulent claim. On these suspect fake claims investigation goes deeper than just the regular and routine. Past employment, previous accidents, examination of health records, pre-employment physicals, and every means you can think of have to be brought into play. You have to have the instincts of a Joe Mannix or a Barnaby Jones at times, to, ferret out some of these fakers.

will continue to improve safety in our workplace.

Repeated warnings have been given that, in our scramble to adhere to the OSHA regulations, we not forget the most important factor—people. We can guard our machinery, put down aisle markings, install the proper signs, get our folks to wear protective personal equipment, and follow all the OSHA rules, but all of this will go to naught if we do not provide the encouragement and instill the right attitude among our employees out on the line. The human aspect of safety is number one in importance. Accidents just don't happen. Accidents are caused to happen. Machines, in themselves, have never been known to hurt anyone. It's the people who cause accidents.

But how do we cope with this human element and the insidious accident? All of us have thoroughly investigated accidents and have just about been unable to uncover any real cause for the accident. In nine out of ten such cases, we write these off as employee carelessness.

But later, with second or third thought and superb hindsight, we may become suspect of our original decision and lean towards something for which we may be at fault, and that is that we did not provide proper and adequate job training. Maybe too, we overlooked an unsafe condition which allowed the employee to take a chance or which provided him with an unsafe short cut.

When we look more deeply into these so-called "employee carelessness" causes, we often uncover a lot of other reasons or even a combination of other reasons. But, if our axiom holds, we will find that an employee's action still will be at the prime source or be the prime reason for the accident.

Since accident prevention is our major goal, the cause of accidents must be understood as a basis for evaluating potential for corrective action. Two broad categories are usually cited as causes for occupational accidents according to the Compendium on Workmen's Compensation. These are: (1) behavioral—involving indifferent, reckless, or negligent attitude, inadequate knowledge, or skill, and sloppy conduct or performance; (2) environmental—involving unsafe phys-

Unfortunately, many of the fakers have the instincts of the super thief or professional crook, and getting down to the bare facts of truth can prove difficult.

But some times you get lucky—a bit of helpful information comes your way or intuition pays off when something just doesn't look right or add up. A good example of this happened just this year. Luck or intuition paid off, for at the outset no tinge of suspicion attended this claim.

An employee, on November 8, 1972, reported to the medical center with severe lower back pain. He was attended by our plant physician and plant nurse. After treatment and rest, the employee returned to work. Within an hour, he was back in the medical center, completely bent over and hardly able to move. After attending the employee, the plant doctor came to my office to discuss the case. The doctor said that the employee told him he had stepped back and bumped his lower back on the handle of a hand truck. He also gave the doctor the names of two witnesses. The plant physician then dropped the other shoe and told me that the employee had all the classic symptoms of a herniated disc.

We did a routine investigation of this claim, even though all the facts seemed to be present and it was all fairly clear-cut. Everything was there—the incident, the witnesses, the prompt medical attention, the professional opinion. We had no reason to suspect any fakery or anything except that we had a bona fide, legitimate claim on our hands.

The employee treated with a chiropractor. He remained out of work for eight weeks and received weekly indemnity benefits. In January, the chiropractor gave us a written report that the employee was able to return to full, regular duty. On January 4, the employee returned to work after duly signing workmen's compensation suspension agreements. However, at day's end, the employee came to Personnel and reported that his back was killing him and that he would have to go out again.

We did not resume his workmen's compensation payments as we had the man on a suspension agreement and the latest medi-

cal report from his personal physician was that the man was able to resume his full, regular duties. We instructed the employee to obtain another statement or medical report from his doctor. He never did this and consequently was denied weekly benefits from our carrier. We continued to carry this as an open claim and continued to build workmen's comp reserves against paying indemnity, an obligation we felt we had as we still had no doubts that this claim was anything but 100 per cent legitimate.

However, as the weeks passed and just nothing was happening in this claim, we began to have some suspicions and wonder. After all, all he had to do was present a doctor's statement and we would have immediately resumed payments.

We wondered what the fellow was living on. A discreet inquiry was made to Rhode Island Temporary Disability Insurance, which revealed that the man was not collecting cash sickness benefits.

At the end, we requested an investigative agency to look into the matter for us. Their report was quick and decisive. The man had worked for us on January 4, the day he had come in and said his back was killing him and he'd have to go out again. On January 5, he started work at a nearby concern in Massachusetts and at last report is still working there 50 to 60 hours a week.

Was this an insidious accident to start off with, caused as it allegedly was by stepping back into a handle of a handtruck? Was it an illegitimate claim from the beginning? I don't know. I do know that this claim, through a bit of external investigative work, ended up costing us \$938 instead of many thousands, the price tag that a disc usually costs.

As much as I would like to be able to send you away with workable answers to this problem, I am afraid that I do not have words of Solomon to impart. I can mention a couple of things we are doing which are working for us and helping us in our accident prevention program.

In order to realistically cope with accidents, it is important to know how and why accidents occur. This can be done by a thorough and unbiased accident investigation

which can later be used as part of an accident analysis.

As has been evidenced, even at our plant, many accidents have been curiously dismissed by the supervisor's statement "Carelessness on the part of the employee." This "reason" has been used for a falling object striking an employee, an unattended truck rolling and striking an employee (not the driver), and a wasp stinging an employee.

A logical approach to an accident investigation might be to play the role of devil's advocate. Instead of saying the accident occurred because of certain circumstances, try to determine if anything positive was done to avoid it.

A good investigation should cover seven points in order to provide useable data. Without being a doctor, you should ascertain (1) the nature of injury (abrasion, burn, fracture); (2) part of body, indicating right or left side and specific area; (3) accident type (caught in, struck by, inhalation); (4) agency of accident, (what the subject was caught in, struck by, or inhaled); (5) hazardous condition (defective tools, improper dress, unsafe design, etc.); (6) the unsafe act (If you are prone to use "carelessness" as the reason, this is the place for it. But reasons such as taking an unsafe position, distracting, failure to warn (all meaning carelessness) are more professional, more exact, unbiased reasons for the accident occurring); (7) contributing factor, which could include disregard of rules, new employee not properly indoctrinated, or lack of skill.

By giving yourself the chance to fairly judge an accident, you are giving yourself an important tool in preventing the next insidious accident.

By the end of the 1950's, what today can be called the "traditional basics" of good modern personnel administration had come to be accepted in many well-managed large and medium-sized companies. For example, developing and maintaining effective two-way communication between a company's management group and its employees is one such traditional basic, whereas the idea of "job enrichment" is new today even for the biggest companies.

By the end of the 1970's, perhaps another

traditional basic will have been added to our safety repertoire, and this is safety sampling. At Ashton, we have been diligent of course, in completing the standard accident analysis to try and determine trends or underlying causes of our seemingly insidious accidents. We have a safety committee and a self-inspection program to assist us in voluntary compliance with the OSHA standards. However, these tools tend to be static, not dynamic. They report on how things happened, not how they are happening. Probably exaggerated by the OSHA standards, we tend to concentrate on unsafe conditions rather than the unsafe acts that cause most of the accidents. But how do we measure and report on unsafe acts so that we can determine where additional training or retraining is required?

At the Ashton Plant we are trying a relatively new technique entitled "Safety Sampling" developed by Vincent Pollina, at the time safety director at Chrysler Corporation's stamping plant in Twinsburg, Ohio. Through this procedure, we can determine, with a desired degree of accuracy, how safely or unsafely our plant is working by quick observations of employees at periodic intervals. All that is needed is a code, a list of possible unsafe practices, and a theater counter.

A sample is then taken and, depending on the percentage of unsafe observations in the initial sample and the degree of accuracy desired, the sample is verified by additional observations. Preliminary results indicate it is not only an excellent tool to pinpoint unsafe acts and allow us to eliminate them before an accident occurs, but it also serves as a powerful motivational tool. When departments and shifts are listed side-by-side in a comparative analysis, individuals who before only half-heartedly supported your safety efforts suddenly become very interested in eliminating unsafe acts and improving their unsafe acts to safe acts percentage.

These techniques that we have discussed—accident investigation, accident analysis, safety inspections, and safety sampling—will certainly help reduce what we may consider insidious accidents at first glance. This is because, upon investigation and analysis, many of the accidents we at first categorized as

insidious were in fact caused, and can therefore be prevented from happening again. Some accidents, however, (like the ones I mentioned earlier), invariably fall in the "oddball" category of insidious accidents, and I feel no action, no matter how well intentioned, can completely eliminate these accidents. We can only improve the work environment to make it as safe as possible and, most important of all, try to influence worker

attitudes to the extent that they become involved in safety and accident prevention and "think safety" at all times. Only by instilling a positive employee attitude can we hope to control those elusive insidious accidents that are laying in wait to ambush our, hopefully, safety conscious employees.

To quote a former vice-president of General Motors, "Safety is good business."

SAFE CUTTING AND HANDLING OF FLAT GLASS

By H. BLAKE GERBER

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Manual Cutting of Flat Glass

In cutting glass manually, several tools are needed to do the job properly. The "stem," which is used to make the cut or score, is a metal handle with a cutting wheel mounted in the end of it. Some stems have a diamond mounted in the end, but the most common is the stem with a cutting wheel.

The straight edge, square, or template, whichever is desired to guide the stem, is used to make the score. To assist in the running of the score, pincers or running pliers may be used. These pliers have a top and bottom which fit together with a downward curve to put downward pressure away from the score and, at the same time, putting upward pressure directly under the score.

In order to assist in the opening of the score on heavy glass such as $3/8$, $1/2$, $3/4$, a "peen," which resembles a machinist's ball peen hammer with a long handle, is used. This is used to open the score by tapping underneath the plate along the line of fracture.

A table of adequate size covered with heavy felt is used to cushion the plate to be cut in a horizontal position. This table should be perfectly flat and free of any lumps which might cause a score to run out due to pressure points under the plate.

After the plate to be cut is laid on the table, the base of the square is butted gently up against the edge of the plate next to the cutter. If the plate is small enough to be cut with an adequate square, a straight edge is not necessary. The edge of the square will serve to guide the stem.

When positioning the square on the plate, caution must be exercised so as not to damage the surface. The table and tools should be brushed off periodically to eliminate any cullet chip accumulation. Any movement during this cutting operation should not be done

hastily because bumping or slipping can cause injury.

To assist in making the cut, the cutter lubricates the stem by dipping it into a container holding a pad saturated with oil. This pad reduces the possibility of excessive oil getting on the plate. Excessive oil can cause a plate to slip out of the cutter's hand. In making the cut, the cutter must be careful not to drag his finger down on the surface of the plate, especially if he's cutting off a narrow trim.

By applying a steady, even pressure over the entire length of the cut, a successful break can be made with minimum effort. If the cut is too heavy or too light, it usually will break out before it has followed its designated course. Then, too, in trying to run this type of score, the cutter must not put undue pressure on the score, thus causing a sudden snapping effect with resulting injury.

In the process of running the cut there are certain factors which must be considered, such as the length of the cut, thickness of the glass, condition and width of the trim, and so on. The "running of the cut" can be done with one hand, both hands, spoon, or with running pliers. The running pliers are preferred because the cutter does not have contact with the glass; also, if he is not experienced, his chances of running the cut without injury are greater.

Running a cut with one hand can be done successfully, if there is enough weight on each side of the score, by placing the second and third finger under and across the score, lifting up until the cut runs. When there is a narrow strip, the second or third finger is placed under and across the score and the thumb is placed on top of the narrow strip. By applying pressure with the thumb with an outward rolling motion, the score should open up. If this process is unsuccessful, an assist can be applied by tapping lightly under the score with a peen or the top of the stem. It is

important to remember that in running the score by hand the fingers must be across the score so that when it opens up, the finger will not come up through the opening.

Running a cut with both hands is used mostly on thin glass, narrow strips, or patterns. The operator holds the glass with one hand on each side of the cut, placing his thumbs perpendicular to the cut, with his index finger under the surface also perpendicular to the cut. By applying pressure from under the plate with index fingers and downward pressure with thumbs to keep plate from coming up when score opens, the score can be run without injury. This section applies to one man operation.

Larger and heavier plates are handled by two or more cutters, since the weight factor is considered. One of the most common methods in running a score in the heavier plates is known as "snapping the cut." This is an instantaneous opening of the score. This is done by providing a fulcrum under the entire length of the score. The fulcrum can be the table edge, a straight edge, or any straight, wooden object placed under the score. In order to perform this process of inserting a fulcrum, the cutter must grasp the edge of the plate to raise it with his hands far apart or have some assist such as a long ruler which gives additional support.

The chances of injury, of course, are increased by the size or weight of the plate being handled. There is always the possibility of injury from strain or over-exertion when handling such glass. Also, any breakage occurring during this lifting process will endanger the cutter and he should, of course, step back from the plate so that no falling pieces can reach him. If the cutter is using the edge of the table for a fulcrum, he should position the plate so the part which he is holding will be supported by a portion of the table's edge. This will prevent it from falling to the floor or swinging downward to strike his legs.

Throwing away the trim or cullet can be a means of injury which must be avoided. The cutter should not try to throw long strips in the cullet hopper, as they will often break enroute. Bulky pieces should be avoided—cut them down to size. They're awkward to handle, and they cause cullet dust. Also,

pieces are apt to fly off and strike someone. All in all, throwing cullet into containers is a dangerous operation. Pieces can fly back and hit the cutter or someone nearby. Cullet on the floor can be as slippery as ice when stepped on. A person should never kick cullet on the floor, since a sharp edge can penetrate a shoe.

In moving plates to storage, they should always be carried in a vertical position to minimize breakage. If the plate is small enough to be carried by one man, it should be carried at his side with his arm inside the plate next to his body, using his shoulder for support if necessary. He should never place his arm over the plate, as in carrying a package.

The lower edge of the plate is always placed in a container first (avoid striking the previous plate), butting the bottom edge gently against the bottom edge of the plate in the container and aligning the vertical edge before placing an interleaf of paper where necessary. Then the plate is placed back against those already packed.

Handling Flat Glass

When a plate is placed on a table for manual cutting, it is carried in a vertical position to the table. Using the edge of the table as a fulcrum, the plate is raised so that the top portion will be over-balanced against the table. The top portion will then be leaned toward the horizontal position with the fulcrum supporting a portion of the weight. The bottom portion is then raised outwardly to drop the plate to a horizontal position. A layer of air between the plate and the table will cushion the fall. Smaller plates can be handled in the same manner, but the lower edge can be placed up on the table top.

If a cutter wants to move a plate of some weight, he should not try to slide, pull, or push it, since this can cause muscle strain or lacerations and may damage the product. He can move the plate by creating an air cushion under the plate as he pulls it into the desired position. This can be done by grasping one corner and shaking the plate up and down to allow air to flow under the plate as he moves it.

If the glass is to be put on a tilt table, the

table should be raised to a nearly vertical position. The plate is carried in a vertical position, with each cutter facing each other with their hands opposite in order to carry the plate and have it in position to place the lower edge on the feet against the table. They then place the plate to rest against the table. The table is then lowered to a horizontal position and the feet are lowered into a recess on the table top.

If the plate is too large and heavy for two men to handle, it is transported to the tilt table, which is in the vertical position, by an overhead crane equipped with vacuum cups mounted on a frame. Before transporting the plate, the vacuum cups should be checked for leaks. Also, a check must be made to see that all cups are activated. The frame should be placed in the center of the plate near the top portion to keep it in the vertical position. Before the plate is removed from the stack, a check must be made to insure that only one plate is removed and that the second plate stays on the stack. While the plate is being transported, the lead man and the trailing man guiding the plate should not walk directly in line with the edge but stay on the side with the vacuum frame. If the plate should fall, it would fall away from the men and any end breakage would go past them.

The use of signals or advance agreement as to direction of travel helps prevent wrong turns or the accidental striking of objects. When the plate is being set on the feet of the table, the surface of the plate should clear the table to avoid any damage to the surface. Of course, the setting down of the plate on the feet should be gentle. The men then apply light pressure to the plate, forcing it to the table top as the weight is supported by the feet and vacuum frame. Once the plate is against the table top, the vacuum is released.

After the plate is cut to the desired sizes, the two-man plates to be removed are positioned by the two cutters over the edge of the table. With one cutter on each end of the plate, facing each other, they position the plate so that it will become over balanced and tend to tilt to a vertical position. By using the table edge as a fulcrum, they apply downward pressure with the lower hand and lift up with the upper hand until the plate is

in a vertical position. If the distance to be traveled by the cutters is short, they then carry the plate perpendicular to the line of travel. If the distance to be traveled is long, a dolly or some type of transporter should be used. If this is not possible, they should carry the plate with the surface parallel to the line of travel. In order to do this, they must set the plate down in a vertical position. The lead man then turns in the direction of travel with his upper hand remaining in position, and his lower hand is repositioned with the thumb down. While he holds the plate, the trail edge man repositions his hands so that both thumbs are down. In case a plate breaks while being carried in this position, each man must discard his portion, bearing in mind that his fellow worker is involved. They must be alert to other traffic in the area. In setting the plate down, they must keep it vertical, placing the lower edge of the plate on load blocks. They should then work together repositioning their hands so they can lean the plate against the stock.

Removing or Packing Glass from Conveyor

Most of the injuries which are common in the flat glass industry are lacerations received in handling the product. This is especially true when someone packs or handles set-offs during the shift. Since he handles the glass more than those who have mechanical aid, his chances of injury are greater. Because of this, it is important that glass handlers be trained to do it properly. On-the-job training is one of the best methods to point out the right and wrong handling procedures. Of course, safety equipment plays an important part in all glass handling, and specified equipment should be designated for each job. Hard hat, sleeves, apron, metatarsal shoes or spats, safety glasses, and gloves give coverage for almost any glass handling job.

For safe handling of glass on conveyors, the work area should have a convenient set up with good housekeeping and ample clearance for arm movement. Condition of the floor is important, with no tripping or slipping hazards.

Any plates that are picked up should have a visual inspection for potential breakage and for quality standards.

Vents, which may be very small, can open up as the glass is handled, causing it to break into several pieces. Flares, which are razor sharp edges caused by defective cutting, can be a source of injury if not treated with respect. Another form of defect the handler must be alert for is a "stone," which is a foreign body formed in the plate. A stone will usually have a series of little vents extending out from the stone. This plate will break up if pressure is put in the wrong area.

When the plate has been examined and is ready to be packed, the packer should raise the plate from the conveyor high enough to clear it. If he is to pack the plate vertically in a container, he will place the base of the plate gently against the base of packed plate, aligning the left side against the container packing block, and press it back into position. Care must be taken not to bump edges of plates already packed and also to be sure plate clears packing blocks. If a plate does not clear the blocks and breaks, there's always a chance of injury in removing the broken plate.

By bringing these items to the attention of the glass handler during safety instructions and equipping him with the proper safety attire, the job can be made relatively safe. Of course, he must be alert and have the will to work safely.

Mechanical Handling

In order to handle stacks of multiple plates, called "glass packs," special equipment is used. A C-frame which is picked up by a crane can be used to convey packs from pack making tilt tables. Also, a pack truck

can be used to pick up the same operation.

In performing these operations, certain precautions must be taken. The equipment should be checked to see that it is operating correctly and that the clamps and feet are properly packed. The operator should always keep the contact between himself and the pack. The handling equipment must be properly maintained and contact with the glass must be avoided. The top clamps and arms on the C-frame must be secured before tension is applied to the pack. Condition of the pack must be checked for breakage, vents, and chips should be avoided. If everything is okay, the flowmaster takes the front fingers holding the pack and it can be released. It is important that the operator of the equipment and the flowmaster give proper signals so that clearance can be observed during this process. Once the pack is clear, the operator must be alert to any traffic and give the alarm which starts the movement in a congested area.

In setting down the pack into another storage area, the flowmaster must keep the frame between himself and the glass. Clearance on all sides must be checked and the impact of the pack on the pad must be low. The angle of the pack must be proper in order to lower the retaining fingers and loosen the clamps on the C-frame. A check must be made to see that the pack is seated properly and that all attachments are free before removing the frame. The operation of the pack truck is done in the same manner except it must have an aisle to travel with a minimum of obstructions.

EYE PROTECTION IN GLASS MANUFACTURING

By RAY M. RIEDER

American Optical Corp., Southbridge, Mass.

Selling wiper blades has something in common with promoting eye protection. If it's not raining, some may say, "Who needs wiper blades?" If there has been no accident or discomfort in a work area, some may say, "Who needs eye protection?" There is one big difference between the two though; if it starts to rain you can stop at any corner and buy a pair of blades. Wouldn't it be great if we could stop at the start of an accident to put on eye protection? Of course, we just don't have that luxury. The next best thing is a comprehensive eye protection program in your plant. According to the August 1973 issue of *National Safety News*, in the "non-durable goods" area, the stone, clay, and glass industries are leading the way with the biggest increase in spending for safety, up from \$30,000,000 in 1972 to \$87,000,000 in 1973—a 190 percent increase. A good portion of that \$87 million will go towards personal protective equipment. So you're on your way, but there is some confusion as to which way, isn't there?

It's almost needless to say that safety is one of the hottest issues of the day, but it is! It ranks right up there with ecology and politics and, as with the others, it certainly has its share of controversy and confusion.

Talk about confusion . . . even the compliance officers have their problems with the regulations. For example . . . right now, written in the regulations under penalties is a fine of up to \$20,000 plus a prison term for a "willful" violation of a regulation that results in the death of an employee. The crime and punishment are spelled out very clear. On the other hand, in the same general area of those regulations the fine for killing a compliance officer is only \$10,000 plus the prison term. Depending on the situation and the amount of available cash, it sort of leaves the choice up to you.

Now, don't get me wrong. As you know,

the inspectors aren't really treated that badly . . . I've read editorials that go from telling you how long the OSHA man can be kept waiting (and still be unbiased) to how much sugar goes into his morning coffee. Knowing this, is great P.R. but . . . I also think it's about time we all became more than just passively aware of the set of rules the inspector that comes into your plant uses as his bible!

This afternoon, I'd like to review a portion of those regulations, the section relating to eye protection especially spectacles. To tell the truth, I hope you're already well aware of most of what I have to say for those who are, this will act as a refresher course. Let's start with a little background on the regulations themselves.

When did Standard Z87.1-1968 really become critical to our business, both yours and mine? When Uncle Sam became interested. Once upon a time, American industry set up voluntary standards. As they got stronger they became ANSI. These were minimal standards designed to upgrade productivity in industry. The Occupational Safety and Health Administration absorbed ANSI Z87.1 because of the need for instant standards.

In January 1972, the Food and Drug Administration took hold of regular streetwear glasses and went off on its own. FDA regulations, therefore, have nothing to do with industrial eye protection. They're concerned only with the impact resistance of regular eyeglass lenses. Hardening is just one of the many criteria a safety lens must satisfy. For example, there's thickness, impact resistance, marking of the frame, penetration resistance, and the monogramming of the lens itself. Let's take them one at a time.

The FDA doesn't require a minimum thickness for streetwear lenses. At first they did, but no longer. On the other hand, a

safety lens must be within certain thickness tolerances—3.0 to 3.8mm. It may be hard to see, but safety lenses are at least 50 per cent thicker.

Both agencies require a drop ball test, but the FDA's ball is just 5/8 inch in diameter and weighs in at slightly over half ounce. Z87 requires a one-inch diameter ball weighing 2.4 ounces. Both balls are dropped from a 50 inch height. Incidentally, we don't batch test for impact. Every single safety lens is drop balled. The slightest crack means the lens fails the test.

Again, the FDA doesn't require a penetration test, but Z87 does for plastic safety lenses, and the needle must not penetrate through the lens. Naturally, this type of testing is done on a statistical basis; the needle is weighted, and invariably there will be some marring of the surface, which ruins the lens.

Streetwear frames needn't be conspicuously labeled to identify the manufacturer, but the front and temple of a safety frame must be marked with the manufacturer's logo or name or the frame doesn't comply.

FDA requires only paper for verification. Packaging, invoices, and so on must carry the maker's name, but nothing goes on a streetwear lens that says who made it. Z87 requires us to permanently identify the lens, as say, an AO product. We sandblast our initials into the lens.

Another Z87 requirement is the burning rate of the frame material. It mustn't burn faster than one inch per 24 seconds. But part of the test specifications are vague. We must use a bunsen burner in a room without drafts. The material must be held horizontally at the top of the flame, but there's no thickness of material specification.

The Z87.1 does have a few gray areas. Some products comply with one section of the standards, but not with another. No pun intended, but one gray area is photogray lenses, for example. These lenses are clear indoors, but out in the sun they turn dark. In its clearest state, photogray lets 86 per cent of light thru. These lenses will meet Z87 impact resistance requirements, but not Z87's transmission requirements for clear, which is 89 per cent. And photograys don't filter out

enough of the near UV and IR rays, so at the present, they fail there, too.

Then, there is the question of sideshields. To meet OSHA's approval, they must be permanently secured to the frame, be the right size, taper correctly, and extend more than half way around the circumference of the lens frame. But OSHA says these sideshields don't cut it for full lateral protection: snap-ons, slip-ons, and slide-ons. According to OSHA, they're not permanently secured, they don't taper properly, nor wrap around the frame sufficiently.

Semi-shields do provide some measure of lateral protection, and they're permanently secured to the frame. But You won't find semi-sideshields even mentioned in OSHA. Do we assume, then, that the very omission constitutes federal condemnation? Time will tell.

Another product, something you're all familiar with, is what most people call a "visitors" spec. Again, there's no specification for it in OSHA. It was developed solely for the purpose of guarding the occasional visitor passing thru a required eye protection area. It wasn't designed to replace spectacles or goggles, or for use in close proximity to a known hazard. It goes without saying, no company wants anyone to sustain an injury on their premises. But visitor's specs aren't in the standards.

Another area of confusion is the compliance officer himself. Does he wear the white hat or the black hat? Well, you have to weigh the cost of compliance and possible fines against employee protection, lower workmen's compensation claims, and increased productivity.

By now, you're probably well aware that this is not the typically-run government agency; this one is building a strong track record. From June '71 thru July '73, there were 86,500 inspections; 55,000 citations; 27,400 violations; \$7,275,000 in proposed penalties; and almost 10,000 employee complaints. By now, I hope you have some idea of how this ball game is being played. Some things have been made perfectly clear. We go by the book and we're ok. Yet some things we have to play by ear.

You'll have to do the same when it comes

of this nature, they can best be answered on an individual basis, reviewing specific operations with a qualified representative.

Take a walk thru your own plant, keeping in mind that old "Murphy's Law," which states: "If anything can go wrong, it probably will." You'll be surprised to find out how many other areas I haven't mentioned are rife with eye hazards. And remember, with OSHA regulations you're not always dealing with absolutes and actualities, but possibilities and probabilities as well. So an answer like "We've never had an accident in this area" really doesn't mean a thing. Simply issuing eye protection won't cut down on accidents. The employee must wear what you give him. Make sure he understands what he's being protected against. Take a positive approach. Stress the benefits of protection. And let him know that the law says he has to wear it.

One added caution about eye protection: It is vital that the lenses are kept in good shape. If they're pitted or scratched, the law requires they be replaced.

Once you decide to institute a program, naturally you'll want the type of eye protection that's best for a given job. If you feel in need of qualified assistance to make that decision, contact a reputable supplier. Call in one of their reps and pick his brain. He knows his products, he knows OSHA regs and how his products fit into your particular industry in your location. You can get many other things out of the rep that'll keep you up to date on new products, services, and developments in your own industry.

When it comes to product information, I don't know specifically what all the other companies provide in this area, but I know what you can get from us. I'm sure other companies offer similar material, such as catalogs, fact sheets, free posters, and safety films you can borrow for free or buy. Various types of support literature and prescription kits help you plan a complete eye protection program.

Companies like mine stay in business by keeping people like you happy. And keeping you happy means providing you with products and services that keep your employees healthy and on the job.

to instituting your eye safety programs. I'm sure you realize that a 100 per cent participation program door to door is by far your best insurance. And I wholeheartedly endorse this type of program. It's the easiest to put into effect and the easiest to police. Realistically, however, with everything else that is happening, not every plant can afford this right now.

But even if 100 per cent participation isn't possible, there are certain areas that must have eye protection right now. If we took a walk through the glass and ceramics industry in general, we could focus on many areas where protection is specifically indicated. In general, any employee who wears prescription glasses should wear safety glasses on the job (remember what we just went over). That definitely includes those who wear contact lenses (planos).

The machine shop is an obvious place—grinding, drilling, welding. Must be 100 per cent. Tailor the needs to the job, from a pair of chipping goggles to a welding helmet.

In testing labs, anyone working with chemicals, solvents, machinery, would need spectacles and possibly a flexible mask or face shield.

Any one around a dusty area, if he is wearing a respirator of any kind, should have eye protection.

Use glasses with side shields any where there is a possibility of broken glass or ceramics, plate glass, ceramic and glass bottles or plates, the inspection area, processing of recycled material, etc. Keep in mind that a splinter of glass in the eye is actually more dangerous than a splinter of steel, because of the use in surgery of magnetic probes.

Shipping areas use wood for packing. A splinter of wood creates the same problem as glass in surgery. Many shipping areas use banding machines with banding material made of metal, nylon, or fiberglass. When that band snaps, and believe me, it does happen, it can cut through an eye like a scythe through butter.

You may have noticed that I have avoided talking about specific lens shades or their absorptive characteristics. With the exception of photogray, this was done intentionally, since it could be a whole presentation in itself. For those of you who do have questions

ENGINEERING NOISE OUT OF A GLASS PLANT

By PAUL E. TOMSHANY
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The Ford Motor Company Noise Control and Abatement Program, as it is known today, began its development in 1969 and evolved in two phases to its present status. Historically, however, the company had become aware of and involved with plant noise problems many years before that. This is evidenced by the fact that as early as 1962 Ford Motor was utilizing a program of hearing conservation. Initially, it consisted of audiometric testing as part of the pre-employment examinations and making ear muffs available to the employees where required. Also, about that time a number of noise surveys were made to pinpoint high noise areas in many of the plants, and a number of efforts were made to engineer noise out of equipment. So even though noise control accomplishments were not unknown to our company prior to 1969, it was the publication that year of regulations under the Walsh-Healy Act that provided the inducement for the initial phase of developing a more positive program of noise control. It's true, as you probably know, that before this time there had been many publications and considerable research pertaining to the subject and study of noise—a wide range of aspects were covered, including the effects of noise on industrial workers and methods of controlling noise in equipment and machinery. Also, researchers had established recommended limits for nearly every aspect of noise and had developed certain criteria to protect hearing. But it was these regulations under the Walsh-Healy Act that provided a standard which represented the medical and managerial consensus of what constituted safe noise levels. Since this was the first federal regulation regarding noise levels in industry, a basis was now available upon which a specific program of noise control and hearing conservation

could be established. To assure that sufficient attention would be given to the new law by Ford Motor management at the local level, a letter issued by one of the company vice-presidents requested that all plants comply with company procedure and policy documents which were being revised to reflect the new federal standards. This response was a reemphasis of the hearing conservation program in existence at that time. You can get an idea of the scope of that program from this list of documents and the subject matter that they covered:

1. A manufacturing engineering office bulletin defining noise control in manufacturing and assembly operations.
2. An industrial relations bulletin listing safety engineers responsibilities (which includes performing noise surveys) and a description of sound level meters and ear protection devices.
3. Manufacturing Standard SX1, defining the limits of noise exposure and a procedure for a noise control program.
4. An industrial relations administration manual attachment outlining a hearing conservation committee and its responsibilities.

This last publication contained a paragraph that set the theme and direction for development of a company-wide program. It stated: "Hearing conservation as related to occupation is the responsibility of Ford management, and in order to have an effective program, the coordination and cooperative efforts of many company activities will be required. The central office staffs will be called upon, as appropriate, to participate in the development of planning concepts and company policies and procedures with respect to implementing an effective hearing conservation program." This document also recommended that all plants form a plant

hearing conservation committee. Its many responsibilities were spelled out and included, among other things, a noise survey of the entire plant with designation of those areas that exceeded a level of 90 dbA.

Concurrently with formation of plant committees, a task force committee was formed at the central office staff level. The function of this group was to guide the development of the overall program. Membership was comprised of management from the offices of industrial relations, manufacturing and plant engineering, medical, and personnel and organization.

As the program began to take shape in this early stage, initial action began with a new round of plant noise surveys. Data gathering efforts by the Glass Division were limited at this point, since we had not yet acquired proper instrumentation or personnel with necessary technical training. Surveys were performed for us, as they have been in the past, by the Industrial Hygiene Department, which is a central staff activity.

Work relating to noise associated problems progressed pretty much according to plan for the next year and a half. During this time, bulletins previously referred to were further revised, and some plants were budgeting funds for noise control projects. The second phase began around the end of 1970, just after passage of the Occupational Safety and Health Act. The two phases were not separated from each other by distinct start and end dates. Rather, the development of an effective program was an evolutionary process.

Now that the OSHA regulations had become the law of the land and affected all industry, the task force viewed this as an incentive to accelerate the rate of progress in the company's program of noise control and abatement. The task force by this time had a fair definition of the company-wide noise problem. This was obtained from various surveys which indicated the number of people exposed to excess noise, the areas that were excessively noisy, and the equipment or operations that were the offending sources of noise. Not available from the surveys was the data necessary to completely define the problem in terms of monetary and timing require-

ments. The need for these provided a reason for further action.

It was realized by the task force that the most important step in the program at that time was to enlist the support of top management. To institute a total noise abatement program, the cooperation of many activities is essential, and to implement such a program requires money. The money and cooperation are much easier to obtain when high corporate priority is given to company efforts to protect employee hearing.

The approach used by the task force was to present, at a meeting of top corporate management, a program consisting of these four parts: (1) review of representative noise problems existing in the plants; (2) explanation of government requirements; (3) medical phenomena of noise induced hearing loss; (4) suggestions of what could be done to solve the problems. Participating in the presentation were two nationally recognized experts—one specializing in the problems of noise induced hearing loss, and the second specializing in acoustics and techniques of noise control. Also used in the presentation were taped noise samples recorded from several noisy plant operations and accurately reproduced in the board of directors room.

As a result of the presentation, a directive was issued by the president of Ford Motor Company requiring all company components to comply with the new regulations. Other points covered in the directive were: development of an action plan, including survey and analysis of plant noise levels; identification of controllable noise sources; and a list of priorities for their control. In addition, a company noise control and hearing conservation coordinator was appointed to coordinate the corporate noise abatement program.

Implementation of the program under this phase was launched by gathering together representatives from all divisions of the company to form a committee to formulate and revise corporate documents on noise control. The first of two significant documents to be produced was a manufacturing standard which specified the maximum permissible noise level for all new machinery and equipment purchased by our company. The sec-

and document was a manufacturing procedure outlining the responsibilities of the various activities and procedures which should be followed in carrying out those responsibilities. Industrial Relations was assigned the responsibility of noise surveys, administrative actions, hearing protection implementation, ordering of sound monitoring equipment, and audiometric testing. Joint responsibility was assigned to Plant and Manufacturing Engineering Dept's for implementation of engineering action to reduce noise generated by existing sources. And these departments in conjunction with the Purchasing Activity received the responsibility of purchasing new equipment in accordance with the newly established noise standard.

To assure that the program thus far established would be properly received and implemented at the plant level, a three part training program was prepared and presented to three different groups of employees. Since the informational needs of each group differed, each training session had a separate objective. One group consisted of management who were informed of government regulations, medical aspects of noise induced hearing loss, and basic principles of noise control. A second group included all those exposed to excess noise—these people were informed of the dangers associated with exposure to high noise levels. The third group was made up of engineering and technical personnel who were to be assigned the responsibility for noise abatement—these people required an adequate background in basic acoustics in order to solve noise problems. Education received by our employees in overall noise problems and the use of ear protection is one of the primary reasons why we have been able to apply the ear protection program so effectively.

In addition to providing educational sessions at the plant level, the task force recognized the importance, even the necessity, of presenting a more specialized training program for selected personnel. The purpose of this program was to make it possible for each plant and division to have someone, sufficiently trained in acoustics, who could serve as an in-house consultant in noise control problems. To provide technical training as

thoroughly and quickly as possible, a nationally known acoustical consultant was retained to conduct a one-week seminar. This course consisted of intensive training in the principles of acoustics and techniques of noise control. The Glass Division took advantage of this excellent opportunity by sending an engineer from the plant engineering department of each plant and from division staff. In addition, these people were urged to obtain further specialized training in acoustics by attending a course sponsored by the company in conjunction with a local university.

This type of educational program has proved valuable to the Glass Division, as our people have been able to initiate and follow to successful completion many noise and hearing conservation projects. I believe that any plant which has significant noise problems should have a person who has at least a basic knowledge of acoustic principles. The cost of such training is certainly not excessive when weighed against the services that will be available to the employer. Beyond that though, it is questionable whether you could justify the additional time and money that would be required to further train an engineer to handle the most difficult noise problems.

As you are probably well aware, some problems can be solved quite inexpensively with the use of simple techniques. Many, however, will range upward from there in complexity, until at the top of the scale would be the type of problem so difficult and costly that it would be unreasonable to expect your own noise control engineer to be able to handle it. For problems of this nature it is more economical to hire an outside acoustical consultant, who already has the required experience and sophisticated equipment, than to develop similar skills in your in-house specialist. Both our Niagara and Nashville plants experienced this situation when they each had occasion, in the early stages of their noise control program, to use the services of an acoustical consulting firm.

(At this point, a series of slides were presented to illustrate the kinds of problems dealt with and the methods used to correct them.—Ed.)

Since the scope of our company-wide noise control and abatement program covers many individual plants, the success of that program has been dependent upon the continuous efforts and attention of many people. Initially, the motivating force for getting the program started was provided by corporate management's commitment to an all out effort to protect the hearing of their employees. But to assure that the program would continue to fulfill its intended goals, the task force committee instituted the use of a noise control status report form. The form serves two purposes:

1. It lets management know on a periodic basis how the program is progressing. Management had approved the expenditure of considerable sums of money and many man-hours of work, so it is important to keep them apprised of the program's accomplishments.
2. In developing their plan of action, each plant established a series of objectives. It is important for a plant to periodically evaluate their position relative to those objectives, to see how far they have come and how far they still have to go. Data for the noise control status report forms is assembled and tabulated by each plant on a semi-annual basis. Data is requested for such items as: location and identification of high noise sources, number of employees subjected to excess noise, number of employees furnished ear protection, number of employees wearing ear protection, solution evaluation, description of corrective measures to be used, timing for installation of corrective measures, and current and projected cost requirements.

Reading quickly through a typical entry, we have Backlite Lehr unloaders with a noise level of 95 dbA; source is a quench and conveyor system. Eighteen persons are exposed for six hours each day. All require ear protection and all use it. Engineering action is feasible and consists of installing acoustical material on air ducts, modifying conveyors, and installing acoustical material around quench units. Estimated completion date is 12-1-73 with an anticipated cost of \$8,500.

After all forms are completed and submitted to the central staff coordinator, the data is summarized for top management and compiled into a booklet called "Noise Control

and Conservation Compliance Status."

In conclusion, I would like to check-off the points that we have found important to our noise abatement program. I believe these are applicable to most noise control programs, whether it involves a single plant or a company with many plants.

1. Get top management support. A commitment by management assures necessary resources will be available to achieve required goals.
2. Establish an effective noise abatement organization. Assign specific duties to those involved in the program and hold each assignee responsible for successful completion of his task.
3. Train your employees. Give each person with noise control responsibility the means to enable him to fulfill his assignments.
4. Establish a workable compliance plan. Choose goals that are within your financial and technical capabilities and work toward achieving those goals.

5. Carefully monitor the program. Don't let it bog down or stray from the established goals. Periodically check the status of the program so adjustments can be made if necessary.
6. Don't buy any new noise problems if you can avoid it. There are enough existing noise problems in our plants without—buying any new ones. Our current involvement with the problem of quieting our plants is due in part to the former lack of noise control considerations when we purchased new buildings, machinery, and equipment. Ford Motor Company took a major step in this area when it developed its company standard, defining acceptable limits for noise generated by machinery and equipment supplied to the company. Of course, not all manufacturers can comply in every instance, but considerable progress has already been made in quieting noisy machinery, and a strict noise level specification will certainly encourage further improvements.

The experience we have gained throughout the noise abatement program leaves little doubt that, in the long run, reduction of noise at the source is the most practical, effective, and economical method of engineering noise out of a glass plant.

Rubber & Plastics Sessions

THE SAFETY MANAGER AS STAFF CONSULTANT

By T. R. WARD

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The safety manager as a staff consultant! What's new about that? When a problem arises about compensable injuries; safety equipment; machine guarding; local, state, and national regulations concerning health and safety; plus fires, vapors, chemicals, physical exams, and God knows what else—the first thought of a staff manager is to call the safety man. He is the "expert" consultant. He's the manager who will "tell us"—or better yet, "take care of the matter."

Good safety managers do advise and protect top management many times in our plants. This is the perceived role of the safety man in most industrial organizations. All these activities are, and will remain, a major part of every safety manager's job. They are part and parcel of the basis upon which he is judged and paid.

In reading articles and talking with safety people, I sought the answer to the question: What are the major barriers to improvement in a plant's safety record?

Some of the replies I found most often repeated were:

1. Safety managers who are not up to date technically or can't adjust to the rapid change.
2. Lack of ability to get necessary money to do the job.
3. The failure of management to train their key managers in techniques of motivating people and influencing their behavior.
4. Lack of ability of safety managers to lead or get the worker involved.
5. Workers are not conditioned to work safely.

But the barrier most often suggested was "Support from plant staff managers that is reflected in their sincere interest, guidance, and involvement."

There are approaches that a safety manager

can take that should help to reduce this important barrier, but in doing so the safety manager will have to replace his "expert" consultant's hat for one marked "process or change" consultant.

Sounds difficult? Unusual? More work? No, I don't really believe so. Let's see if we can't build a viable case for this approach.

I wonder how much time the average safety manager spends doing something, anything, about overcoming this barrier? What would you guess? I have asked, and either there is no answer or an estimate that is very low.

What all this says to me is that perhaps our safety managers are not spending enough time in areas that have greater potential for improving upon the safety record of their organization. It may well be their efforts have not been guided in this direction and they are not seen as the manager responsible for promoting and implementing activities that would lead to greater involvement, interest, and commitment to safety on the part of staff managers.

What are some of the approaches a safety manager might use to influence staff management and to guide their thinking and performance that are clearly recognized as supportive, concerned, and committed to safety? The first approach I would suggest is "problem identification."

Arrange a problem solving session with plant manager and staff to identify barriers that are preventing progress towards a better safety climate or record. Also identify those practices, programs, etc. that are in current use that are contributing to improved safety climate or record. Then analyze any barriers or helps, and develop an action program to overcome barriers or promote the helps. This is an old problem-solving technique called

"force field analysis." It is used today by many organizations working at making jobs more meaningful, and is called "red lighting." The effect of this sort of problem solving-planning activity is to give ownership of the whole group to the resulting action plan. It is theirs, not the safety manager's.

One such meeting won't change people or enlighten them to be safety conscious from that point on. The process calls for continuing reexamination of barriers and helps and refinement of action programs—in short, involvement on the part of all.

If this approach sounds too difficult or abrupt, I suggest a preliminary step of cultivating a couple of staff members first. Do some informal problem solving with them—get them interested and concerned, and they will help you to sell the top men in trying this approach.

The second approach is to analyze your organization and select a group which sees a real need for improvement. Work with that organization in identifying barriers, and make specific plans to reduce these barriers. Here the safety manager needs not only to coordinate the planning but to guide the group in selecting reachable goals that will show progress and build enthusiasm for continuing efforts.

The example of success in one segment of the organization develops confidence and interest to know more about the involvement of the plant manager's staff.

Another problem solving technique that is time honored yet effective is brainstorming for ideas. This exercise gets people involved, contributing, and willing to share ownership of the product. A safety manager needs no real additional skills to use this technique to obtain new approaches to promoting safety with his staff management.

Still another technique that can be used by a safety manager to promote involvement and support of staff management is called "analyzing performance discrepancies." Too often, line management people say they have difficulty in getting workers to—perform according to safety standards (unsafe work habits - remove guards - failure to report hazards, etc.) They request a training program to solve such performance discrepancies as fork

lift truck operators causing building and equipment damage and hurting people. The solution is to re-train and license. How often does this work? Perhaps more to the point, how long does improvement last?

Analyzing performance discrepancies is a simplistic concept, easy to read and understand book by Mager and Pipe. It provides four alternatives to training as possible solutions to such problems. A safety manager can use their techniques to help a staff member look at his safety problems and provide some very realistic approaches for solution.

Briefly, Mager says this: "if the worker could perform a task safely if his life depended upon it, then it is not a training problem but one which must be examined in four different categories:

1. Is it punishing to do it the desired way?
2. Is it rewarding not to do it the desired way?

3. It doesn't matter whether he does it.
4. There are obstacles to doing it.

The safety manager, along with the line manager may find, through investigation, the real cause for non-performance and then more effectively close the performance gap.

Again, if the safety manager can show any staff or department manager how to get involved constructively in improving safety climate, he has taken the first step towards developing the whole staff group's awareness and interest.

These approaches are not exotic, difficult, or beyond the abilities of any safety manager today. They are tools that would help him to overcome the barrier of lack of commitment and involvement of his plant's staff. After all, a plant manager wants his safety manager to have the expertise to predict and deliver results; he expects concrete proposals that are relevant to his priorities, and he wants his safety manager to demonstrate sufficient skills to obtain support and agreement instead of annoyance and confusion.

How better to meet these expectancies than to show staff management how to be involved in problem identification, reach understanding on their own needs and goals, and help produce changes through effective analysis of performance discrepancies?

More and more these days we read, hear,

and see evidence that all people (worker and managerial) need work that is more meaningful, more involvement in planning and controlling their work. We recognize that managers in every phase of the business must change to adjust to these needs.—

The whole area of safety is no exception. The alternative to business as usual is involvement and participation on the part of all employees, led by the plant manager and his staff. Failure to recognize the changing needs of the people could result in below-standard performance in safety. The challenge is for safety managers to learn how to

help their plant staffs become involved, for their real commitment remains the most important positive force for improving the safety climate in industrial organizations.

Finally, I believe that an effectively led safety program by the plant staff produces an atmosphere of trust, confidence, and belief in their sincere regard for the workers' health and safety. It also produces a planned approach where objectives are formulated, barriers recognized, and the safety manager spends his time and efforts towards those agreed upon goals.

APPLIED SAFETY MANAGEMENT

By A.S. WARREN, JR.

Regional Plant Manager, Chevrolet Motor Div., Parma Plants, General Motors Corp., Cleveland, Ohio

"These accidents have arisen in the manner following. By the Factory Act, passed in the seventh year of Her Majesty's reign, it was enacted, among other things, that all parts of the mill-gearing in a factory should be securely fenced. There were no buts and in the Act itself: these were allowed to step in and limit its powers of preventing accidents out of a merciful respect, not for the blood of the operatives, but for the gold of the mill-owners.

"Why do we talk about such horrible things? Because they exist, and their existence should be clearly known. Because there have occurred during the last three years more than a hundred such deaths, and more than ten thousand (indeed, nearly twelve thousand) such accidents in our factories, and they are all, or nearly all, preventable."

Sounds rather like 1973 doesn't it? At least our critics would so indicate. The above was written by Henry Morley in *Household Words*, a periodical published by Charles Dickens. The year was 1854.

There was in Great Britain a law? I'm not here to talk about the law—you've heard about it. I'm here to talk about rights. In this era everyone is demanding rights: ecologists, politicians, feminists, children, criminals, citizens. But, what about your rights—yours and your organization?

I would like to be very radical now. Rather than grant you rights, I would like to deprive you of one right—that is, your right to permit one of your employees to be injured or killed in the process of manufacturing one of your products. Wouldn't it be wonderful if I could take that right away? It would, you must agree, be an unprotested amputation.

Many companies have received many awards again this year. But, it's like the pessimist and the optimist. The pessimist will look

at the whiskey bottle and say it's already half empty. But, the optimist will tell you it's still half full. I guess the optimist will look at the record and say we're doing well. But the pessimist knows that it doesn't mean we've had no injuries, no fatalities, that it just means someone else is doing worse.

How do we get to be perfect? How do we achieve no injuries? How do we achieve no fatalities? Perhaps we've convinced ourselves it's impossible to obtain perfection, and yet we have within the industry an example. Several weeks ago, I had brought to my attention a tire textile plant, which is inherently hazardous, in Bennettsville, South Carolina. This plant has gone seven years without a lost time accident. Then there's the footwear plant in Naugatuck, Connecticut, that has gone 17,422,846 man hours without a lost time accident. Outstanding! Perfection is possible. The employees in that plant are determined that they will not get injured.

Perfection is possible, but talking about it isn't going to do it. We can say "safety first" all day long, and it won't change things a bit. Studying safety standings won't do it. Telling yourselves you're doing well won't prevent the first man from being injured. Likewise, bemoaning the fact that your organization has slipped won't prevent the next man from being injured. Correcting hazards just because the OSHA inspector is arriving won't do it—he may not show up until after the accident.

How then?

Basics, gentlemen, basics! What are pinch points? What are catch points? What are squeeze points? How do you store? How do you stack? Hazardous material?

Everyone knows the answers.

Or do they? Are we training our new foremen? Are we retraining our experienced

foremen? Maybe? Sometimes? No?

Are we training the employee—the guy who sticks his hand right in there? Not likely.

How are we training our supervisors? A lot of complex OSHA requirements? Are they confused? Are you confused?

With whom are we more concerned, the OSHA inspector or the employee?

Let's get back to basics. Let's stop running in circles. The law won't keep a man from getting hurt, but you might. His foreman might. He will! But, and only if, you and he know what pinch points are—know what shear points are—know how to lift and bend. Basics! Basics! Basics! Then and only then will we be fulfilling our function as outlined in each corporation's basic principles of safety. (There's the word basic again. Look at your own published principles, and I'll be very surprised if the word is not prominently mentioned.) I'd like to mention several basics that seem to be common to everyone's program.

1. Develop safety instructions for every job. Safety rules and instructions as to safe practices should be set down in written form covering each job in the plant. The material should be used as the basis for safety instruction of new employees and of employees transferred to new jobs.

2. Instruct each new employee. Each new employee should be thoroughly instructed in general safety policies, rules, and procedures before being referred to his supervisor for job training. In turn, the supervisor should review with him thoroughly the safety measures of the particular job before he starts to work. Subsequently, the employee should be followed up closely to make sure he understands and is carrying out the safety instructions applicable to his job.

3. Make every employee safety minded. The cooperation of the individual employee is vital to the success of a safety program. Continued education is required to make certain that all concerned, management and employees alike, do their part in protecting the safety of the individual at all times. Every available medium—safety booklets, posters, signs, and plant papers—may be used to good advantage in furthering the objectives of such a program.

What could be more basic than these?

I like to talk about teamwork. At a recent conference, I talked about teamwork. At plants, I talk about teamwork. Here, I'll talk about teamwork. To get teamwork, though, you've got to have a healthy team. You can't field injured players. To keep players from getting hurt, a football team doesn't practice its passing attack. A basketball team doesn't practice its shooting. First they exercise. Practice the basics, do the calisthenics. Block! Tackle! Pivot!

Back to the exercises. Back to the basics. I know you all have a favorite supervisory training tool. Have you used it to train and retrain supervisors in the basics of safety? If not, start. If you have used it, use it again. This time get to some people who haven't seen it. Change it to suit the employees and train them with it. Then change it to suit the plant manager and train him with it.

Does your manager actively participate in your safety training? My Number One basic is "provide active top management support."

What does that mean? Hang a sign on the manager's wall? Keep awards in the manager's office? Why not ask the foreman if there is really top management support? Should he shut his own equipment down because of a pinch point or because a guard is missing? Ask him. If his efficiency is down, does that create a sliding scale of safety importance? That's what some foremen believe! Why? Well, let's look at it.

When is the last time a general foreman shut a job down for safety reasons at your location? The superintendent? The plant manager? I must be kidding—that's the safety department's job. And they damned well better be able to justify it.

Well, I'm not kidding. I believe that your relationship with your manager ought to be such that he will go into the plant with a safety awareness and tag a job out if it is unsafe. People would then believe safety is first! What a tremendous awakening would take place within an operation so favored. The credibility gap would surely begin to close and the morale of your foremen would soar to Olympian height.

You safety people. See a bad condition? Don't write a letter. Ask the manager out to

look at it himself. Let him fill out the tag. Let him involve himself. Provide him with the opportunity of actively instituting principle Number One. A safety supervisor I know has a sign on his desk: Y C S S O Y A—"You Can't Sell Safety Sitting." That may be in the wrong office. Perhaps it belongs in the manager's office. He's got to be the one to start selling safety, and he can't do it sitting either.

When did you last spend an hour with the plant manager discussing the safety program in the plant? When did you and he last spend an hour touring the plant? Is he personally involved with you in safety? You have a responsibility to him, yourself, the employees and the company to see that he is involved and that your relationship is wide open.

What about the cost of maintaining a safe workplace? Training programs! Jobs down! People in class! An adequate safety staff! Well, the cost of accidents to American industry this year in lost wages, medical costs, damage to equipment and materials, delays in production will probably exceed \$8 billion.

On the other hand, we talk about productivity going down. Why? Everyone tells us that we need job enrichment, more recognition for the worker. Let me tell you that if the employee believes that you sincerely believe in his well being, and that you really want to keep him from getting hurt, even at a cost of training him more than five minutes a month or shutting his job down until a hazard is

alleviated, his job will have been enriched. He will have been recognized. What about his suggestion to improve safety or housekeeping? Examine it closely. Implement it. Follow up. I guarantee positive reactions, improved worker attitude, and lower costs will result.

Do you have confidence in "you?" For a few minutes, stop being you and be the plant manager. Feels good doesn't it? Now let's evaluate the safety supervisor—you.

What kind of a safety leader are you? Notice the word leader—are you? Not a clerk or a policeman, but a leader. How does the plant, hourly and salaried employee, regard you? What is your image—leader or comic? How would you rate yourself on a 1 to 5 scale?

Remember, your right to have an injury has been taken away. You will be exposed to many new things. New technology. New techniques. New laws. Take them back with you and use them. That's progress. But you're still going to have to sell safety. To do that, and do it well, I ask you to specifically concentrate on two things: (1) go back to basics; (2) gain top management involvement—not just verbal support, but active participation. Then, and only then, will you make true progress toward an accident-free work environment.

Until that time, I'll continue to play the role of the pessimist in the earlier story. The job is half done.

ALCOHOLISM AND DRUG USE CONTROL IN THE INDUSTRIAL PLANT

By E. L. JOHNSON

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If some new and terrible calamity were suddenly to strike us here in America, a unique disease of unknown cause—possibly due to a noxious gas or poison in our soil, air, or water, it would be treated as a national emergency, with our whole citizenry united as a man to fight it.

Let us suppose this one unique condition to have so harmful an effect on the nervous system that nine million persons in our country will go insane for periods lasting from a few hours to weeks or months; an insanity that will recur over periods ranging from 15 to 30 years.

Let us further suppose that during these spells of insanity, acts of so destructive a nature will be committed that the material and spiritual lives of whole families will be in jeopardy. A total of 45 million persons will be cruelly affected. Work in business, industry, professions, and government will be crippled, sabotaged, or left undone. And each year, billions of dollars will need to be spent merely to patch up in some small way the effects of the epidemic on families whose breadwinners have been stricken.

Finally, let us imagine this poison or disease to have the peculiar property of so altering a person's judgment, so brain-washing him, that he will be unable to see that he has become ill at all. Actually, so perverting and so distorting his view of life, that he will wish with all his might to go on suffering.

The dread condition, just envisioned, is actually here. It is the unique disease, alcoholism: a progressive illness that normally develops over a period of years and usually shows up between the ages of 35 to 50, the prime years of an employee's productivity. One well accepted definition of alcoholism is: drinking that causes, for the drinker, serious problems

in any major part of his life, such as his job, his health, or his family.

Yet, alcoholism is only one of our major problems of concern. At Firestone, we care about people. We're not only concerned about employees who suffer from alcoholism, but about people who suffer from many behavioral/medical problems that impair their attendance or work performance. These problems may be the result of drinking that is progressing into alcoholism, drug misuse or abuse, or other behavior disorders which result in excessive absenteeism and/or deteriorating job efficiency.

Let's concentrate on the facts as we know them, and as they apply to the employment community. The guidelines we establish will apply to all related disorders, and to many people with various problems who can benefit from the program we have established. We know there are differences but also many similarities in the progressive development of many of these behavioral/medical disorders. Because the consumption of alcohol is legal, those suffering from the disease alcoholism are readily available for research, while those misusing or abusing illegal drugs seldom volunteer for research projects. Therefore, let's place our emphasis on alcoholism, even though it represents but one area of our concern.

The uncontrollable compulsion to drink daily or periodically to the point of serious physiological, psychological, social, and spiritual harm to the individual and his family seems to depend upon the operation of a number of factors working simultaneously, factors which we think may be environmental, constitutional, physical, social, cultural, or emotional. In other words, alcoholism is a complex illness of many varying causes. We

do now know, however, that a person can break free and recover if sufficient help is given. The victims cannot drink alcohol in a normal way and will never be able to do so. But, they can learn to live a normal, productive and satisfying life without alcohol, and with little or no craving for it.

Drinking, as well as the other behavioral/medical problems, will be considered the legitimate concern of Firestone in any individual whose repeated or continued overindulgence interferes with the efficient performance of his work assignment. Mythology, folklore, and other common misconceptions have caused a social stigma that has led to more suffering, hardship, insanity, remorse, and death among our alcoholic population and those affected by this disease, than anything we know of. Because of this inaccurate information, we often cover up the people problems until the victims become problem people. We fail to hear, see, or speak. We pretend the problems don't exist. The results of our repeated demonstrations of this attitude caused one researcher to say, "How can you treat alcoholism, which defies definition, in an individual who doesn't wish to be treated, in a society that doesn't want to believe it exists?"

The perpetration of this mythology and folklore, based upon the common misconceptions that alcoholism is a moral problem, therefore a public and private disgrace; that an alcoholic is usually an unemployable derelict; and since employers get rid of such employees, there cannot be many alcoholics on our payrolls, caused The National Council on Alcoholism and other interested groups to conduct intensive surveys of the alcoholic population. Some of the facts they uncovered are quite interesting. For instance:

They discovered not more than five per cent of the alcoholic population ends up on skid-row; and that five per cent make up only six to eight per cent of the total skid-row population.

Alcoholism does not respect age, race, creed, color, sex, national origin, or economic, social, or educational background. It crosses all barriers with no discrimination whatever and is so deadly that, at a minimum, it occurs in approximately one out of

every 10-12 adult persons who drinks any alcohol at all.

Contrary to popular public opinion, 95 per cent of the alcoholic population are employed, family-centered individuals, or both.

Most of us deceive ourselves by ignoring the fact that there is a cost to these problems. For example, there is alcoholism's social cost to the nation—traffic fatalities. Fifty per cent of all traffic fatalities involve alcohol consumption. Over 3,000,000 national arrests annually involve alcohol. Over 12,000 homicides and suicides in 1970 were attributed to alcohol. Heavy drinking shortens a normal life span by 12 to 15 years. Loss in human suffering is beyond calculation. A total of 45,000,000 persons are cruelly affected when family members who have been damaged by the ravages of this disease are added to the picture.

The cost to industry is equally staggering. You can see why, with a \$10 billion drain on the economy in lost work time, a \$2 billion cost for health and welfare services, and \$3 billion in property damage, medical expense, workmen's compensation claims and insurance, that this is known as industry's \$15 billion annual hangover.

Let's use these facts to bring our problem closer to home. In round numbers, The National Council on Alcoholism estimates that six per cent of the average work force is suffering some stage of progressive alcoholism, and 25 per cent of each alcoholic's annual salary is the average cost to his employer.

For simplicity's sake, let's assume Firestone has 10,000 Akron-based employees, and the average annual wage of these employees is \$10,000. If twenty-five per cent of that wage is the loss to the employer, and it is multiplied by six per cent of the 10,000 employees, or 600 it would cost Firestone \$1,500,000 annually for alcoholism, in Akron alone.

Assistance programs of other companies have been re-surveyed after they had been in existence for sufficient time to assure statistical data would be meaningful. In some companies, surveys revealed that: 25 per cent of the employees referred for treatment were white-collar workers such as secretaries and bookkeepers; 30 per cent were blue-collar workers, normally in the more skilled crafts-

men classifications such as machinists, electricians, and pipelitters; and 45 per cent were professional and/or managerial personnel. These statistics are not presented to imply the more skilled an individual is the more prone he or she is to alcoholism or related disorders. They merely point out that alcoholics are not unemployable delinquents.

Surveys also revealed: 13 per cent of those referred for treatment had completed grammar school; 37 per cent completed high school; and 50 per cent had attended or graduated from college.

Realistic statistics on female victims of alcoholism are difficult to tabulate. Information indicates that from 25 to 33 per cent of those referred for treatment were women; while from 2/3 to 3/4 of those referred for treatment were men. It is suspected that the actual percentage of those suffering from alcoholism is 50 per cent men and 50 per cent women, because when a woman begins to progress into alcoholism, she usually "voluntarily retires" from the work force and goes home to become a "better" wife and mother—she becomes the hidden drinker, the closet drinker. Very often, there is little or no intervention on behalf of our female alcoholic victims until after they have lost home, children, and all self-respect.

And how about the husband who has left the drinking wife at home with the children? He brings those problems to work with him. How can he concentrate on his job when he's worried about his wife; about whether the house is burning down with the children still in it? It has aptly been said: "The spouse of the souse is often more ill than the alcoholic." They have been made that way through constant exposure, certainly against their will. Alcoholism is rightfully known as the family disease.

An alcoholic is like the visible part of an iceberg, supported and kept above the waterline by a far greater mass or density below; that mass or density is composed of:

1. The alcoholic's family, who doesn't want it known there is one of those people in their family, or who because of their outright love for him, continue to cover up his condition thinking it is the right thing to do.
2. His union, who says, "He pays us union

dues, we have to protect his job."

3. His employer, who says, "He's been a loyal employee for 15 years, and does the work of a man and a half—when he's here."
4. His fellow workers, who say, "He doesn't drink any more than I do; he can't be an alcoholic."

Approaches such as these are better termed "bleeding heart" approaches. We say, "How would she support her children if we took his job?" We say, "He's a good man when sober." We say, "Maybe he'll shape up." Many people fail to recognize that alcoholism is a progressive, deadly, often terminal condition. The disease is treatable and can be arrested, but as long as we shelter the alcoholic from the consequences of his drinking, we are literally handing him a time bomb. We are killing him with our kindness. In fact, in many instances, our inaction will result in insanity or an early death.

We can make a graph to reveal the addiction process as it relates to job performance. It can also be used to relate to many other emotional-behavioral-medical problems. Using job performance as a measurement, in the first several years of the addictive process, job performance is going to compare with the social drinker's job performance. At this point, our alcoholic is drinking to a degree that no one suspects progressive alcoholism. However, over a period of time, things are happening to this individual that can be observed if we pay attention. The upper line will represent management's evaluation of the employee's job performance. The solid line represents his actual job performance. The bottom jagged line will represent a typical crisis. A crisis might be a drunken driving charge. Another crisis is when the wife takes the silverware, the kids, and the dog and says she is leaving. "I'd better pull up for awhile." The employee straightens out and his family and his immediate boss (the supervisor at any level) always have a tendency to see this in the best sort of light. That is why management's evaluation is above that of actual job performance.

The area of greatest cover-up occurs from the seventh to eleventh year of the addiction process. During this period, the alcoholic is

becoming more and more ill, but nobody is taking any action because of the stigma associated with alcoholism. We find that the average alcoholic will be employed by the same company for approximately 14 years before termination. Every alcoholic on a payroll will have to be released sooner or later unless there is some intervention.

In the past, Firestone has followed a letter of instruction for clock-card employees outlining the procedure to follow for people under the influence, or suspected to be under the influence, of alcohol. That procedure is known as the "Discipline Program." The Discipline Program instructed plant protection and/or management representatives to make a determination as to whether or not the employee was capable of working safely and efficiently—based upon observations of action or speech as the indicators of his being "under the influence." In the past, Firestone has not had a specific procedure to follow for salaried employees.

The discipline procedure is usually limited in application to the late-stage of the progressive alcoholism scale. Results at this stage of progression are poor, at best. Damage has been done to the employee in impaired physical, emotional, and social health; to the company through the results of poor attendance and deteriorated member morale, as evidenced through the suffering brother or sister becoming a constant griper and a bad griever.

The discipline program was not designed to differentiate between the various stages of alcohol usage but plant protection or management representatives were expected to diagnose alcoholism, not as defined by the medical profession but by their own misconception of what constituted an alcoholic. The discipline program makes no distinction to separate the social drinker, the heavy drinker, the alcohol dependent, or the addictive alcoholic. It puts them all in the same pot, treats them all the same.

Treatment for anyone who has reached the late-stage of one of these behavioral/medical problems, such as the chronic alcoholic, is extremely long and difficult, if not impossible. In other words, we appear to be getting into the act too late because our pro-

cedure has seemingly been based upon the unwritten policy, that if reduced to writing would read approximately as follows: "We will continue to pay you for the successful concealment of your alcoholism or other problems. When you can no longer hide your problems from us, we will discipline or terminate you."

No one wanted to face up to the problem. They didn't understand, and therefore they avoided it. No particular person or department at Firestone is responsible for this unwritten policy of concealment. It came about because of the social stigma that surrounds these various emotional-behavioral-medical problems. Every employee from top management and labor to line worker brings these attitudes of rejection into the company. Supervisors at all levels of the chain of command feel awkward and unsure of themselves when faced with one of these problems.

Since there has been an unwritten policy concerning these behavioral/medical problems, the victims of the unique disease have been motivated to conceal the problem, and he or she has become extremely skilled at concealment. Let's suppose that a person suffering from alcoholism is sent to the hospital. If he returns to work with a report from the doctor listing the reason for hospitalization as gastritis, stomach ache, flu, cold, or some other hidden diagnosis, nobody gives him any trouble. The company takes care of his group hospitalization claim and pays him sick-leave and other benefits.

But if the employee returned to work and said, "I was off on a drunk and ended up in the hospital," what would happen? Various types of penalties and disapproval would probably follow, such as social condemnation from management, labor, and fellow workers and, finally, risk of the employee's job.

The old system rewards an employee if he keeps his problem hidden, but punishes him if he admits its existence. This is one reason why the individual will not seek treatment until the alternative to treatment becomes more intolerable than the treatment itself. Application of the unwritten policy led the suffering individual to deny his problem, management and supervision to underestimate the problem. The issue was ignored, we

were side-tracked. The employee was disciplined, demoted, or discharged. Everyone lost!

Firestone's new program has no intention of eliminating discipline. Under the old program, discipline was the only step taken. We have left discipline as the last step—and we have established an employee assistance program that is corrective in nature, that deals with the pre-alcoholic, early, and crucial middle stages of this progressive disease. It is functional and preventive and is based on early identification of these unique diseases.

The program specifies methods motivating the sufferer to accept help. The motivation to accept treatment is often found to be far more effective than the treatment itself.

Ingredients of any successful control program are: knowledge of the need; top management commitment; a workable disciplinary procedure; an effective referral process; and follow-through.

In order to uncover behavioral/medical problems which include, but are not limited to, alcoholism, drug abuse, bad interpersonal relationships, or a personal crisis in the employee's life; to supersede the old unwritten or punitive policy;—to intercept the individual progressing into these afflictions at an earlier stage when treatment is much more effective, a policy has been developed which covers the following specific points:

1. What. Behavior/medical problems, including the unique diseases, alcoholism and drug abuse, are recognized as preventable and treatable illnesses. The company's legitimate concern with alcoholism is limited to its effects on absenteeism and work performance, not social drinking. Improved work performance to an acceptable standard is the basis for continued employment. The decision to undergo treatment is the responsibility of the employee. The decision to seek treatment will not be detrimental to job security.

2. How. Training sessions will be provided for all management and supervisory personnel; and for union personnel, if requested. Information and education on alcoholism and drug abuse will be provided to all employees.

3. Results. The objective of the program is

to retain, help and aid our employees, and restore them to full productivity.

Nothing in this statement of policy is to be interpreted as constituting any waiver of management's responsibility to maintain discipline or the right to invoke disciplinary measures in the case of misconduct which may result from or be associated with the use, misuse, or abuse of alcohol or other drugs.

Our concern is not limited to alcoholism, nor are we concerned with social drinking or the social drinker. Under Firestone's new policy, we will concentrate on early identification of all behavioral/medical problems, including progressive alcoholism and related disorders, and we will confront the individual on safe ground: absenteeism and/or deterioration of job performance. By so doing, we will eliminate the old approach of concealing these problems by sweeping them under the rug, by procrastinating on decisions, by refusing to face facts, and we must find a way to remove the supportive props of our troubled employee population.

As one example of what we mean by "props," we mean that we must find an acceptable way to remove the supportive mass of the alcoholics' "iceberg" and supply them with the motivation they will need to compel them to swim to recovery when they sink to the waterline.

The program we are presenting has two basic phases: early identification, and treatment. Early identification is preventive in the sense that a primary objective is to prevent further progression of behavioral/medical disorders as soon as possible after the detection of a probability of existence.

The major focus of the program, in terms of the work to be performed by the company, is completely divorced from treatment per se. Rather, it focuses directly on early identification functions which must be primarily accomplished through the coordinated efforts of all concerned.

Early identification is the tough part. Treatment, utilizing existing community resources, should present less and less of a problem as more and more resources are developed. If, through our combined efforts, we can't make the early identification aspects of our program work the treatment aspects,

utilizing existing community resources, won't have a chance.

Again, it must be emphasized that in the early identification aspects of the total program we advocate focusing on the employee's performance, and not on his problem. We apply objective appraisals, not moral judgment. We pay attention to such things as attendance, quality of work, appearance, attitude, initiative, and dependability.

The key man in our program is the supervisor, acting as a supervisor and not as a diagnostician or counselor. When we refer to supervision in our program, we are speaking about management and supervision at all levels—a supervisor, or manager of people, is paid to observe and monitor behavior affecting performance to assure a service is performed, to assure the product is produced and can be sold. If we observe and monitor work, we will notice when an employee's performance becomes erratic or sloppy, and begin to deteriorate.

Most employee assistance programs have a common problem: an inability to implement a well-formulated policy into action between the victim and his or her immediate supervisor. Automatically, a supervisor becomes indecisive when faced with one of these problems; as one manager said: "No one wants to turn a guy in—it's like calling him a communist." This gap between formulating a program and putting it into action can be traced to three popular but inaccurate notions, or excuses.

The first excuse is cover-up. Cover-up helps us very little in understanding a manager's reluctance to act. It suggests that he deliberately and consistently keeps the alcoholic employee from coming to the attention of proper authority. This is not true. A more realistic picture would portray the manager as being torn between using a policy and his program or not using it. This is what results in indecision and causes a reluctance to act. This reluctance to act might well be traced to the supervisor's conception of his own responsibility. Due to the folklore that has surrounded alcoholism for years, the supervisor still has the feeling it is his responsibility to handle the problem. As a manager of people, he is expected to handle and cor-

rect problems involving employees. Hence, referring an alcoholic employee to some outside agency (including the medical department) is, in his mind, an admission of his inability to handle the situation.

Second, the excuse, "Often a good worker," suffers equally from a lack of realism. This means the boss doesn't use the program because he wants to think the worker will straighten himself out and all he needs is a little more time to work out the problems that are bugging him. At one time, the developing alcoholic probably was a good worker; however, as the alcoholism progresses, he becomes a first-class headache for his manager. The supervisor is often forced to re-arrange work, supervise more intensely, and add to his work load in other ways as the result of the employee's drinking problem. The second excuse is often supported by the feeling of his work group, that is, "The drinking problem should be kept among the boys." The manager who deviates from this may damage his relationship with the work group, making it harder to get his job done.

If a member of the group had been hit by a truck, he would be rushed to the hospital; but the same member hit with alcoholism or related disorders is ignored because they can't see the "blood." The fact that the employee was once a good worker should not excuse a manager's reluctance to use the company-provided program.

The third excuse: "Hidden nature of alcoholism on the job." If the boss is unaware of a drinking problem, how can he do anything? Contrary to popular thought, developing alcoholism is anything but hidden. Usually, there are many persistent on-the-job signs such as poor quality work, tardiness, absenteeism, and a poor attitude.

As the alcoholism progresses into the middle stages of the disorder, the individual's actions are anything but "hidden." But unfortunately, the manager who sees him developing a drinking problem and who bears the brunt of his poor work still resists the company-sponsored program.

Disappearances from the employee's work post also increase. Unlikely and ridiculous excuses are often used to explain these absences as well as his poor quality and quanti-

ty of work. Physical symptoms such as red or bleary eyes, and hangovers on the job are also a part of these warning signs. When there are sharp mood changes after lunch, or unusual personality changes such as a sudden increase in loud talking, the boss has good reason to believe that something is amiss; perhaps a drinking problem exists.

The image of the alcoholic as a skid-row bum, a court repeater, a park bench sleeper is so common that the label "alcoholic" is applied only in the most severe cases and as a last resort. To say that this image is misleading is an understatement. So let's not create or let a gap exist between Firestone's policy on behavioral/medical problems and its implementation because of these three factors: the manager's misconception of his own responsibilities; the feelings of the employee's work group; and the stereotype image of the alcoholic.

It is very important that the dividing line between discipline for violation of company rules and the referral process be kept entirely separate, except in terms of motivation. We do not discipline an employee for suffering from a disease! But we may have to apply discipline if he refuses to seek treatment or if his work performance continues to suffer as a result of the illness.

An assistance program can never be allowed to become an umbrella under which an employee can shelter himself from the consequences of poor performance on the job, or a discriminatory weapon against certain individuals when they are found to have a chronic condition. Firm and consistent application of corrective discipline will force an early decision of accepting treatment or discharge for excessive absenteeism or poor job performance.

Rehabilitation is a pro-people, not a pro-management or a pro-labor, activity. However, a company may have a beautiful plan on paper, but if the leaders, the shop stewards, and the rank and file of labor groups are opposed to it, the company will not get very far in accomplishing its objectives. Therefore, very early in implementation of our program, the cooperation of labor groups was enlisted. It has been found that labor will give whole-hearted support when we are

forthright in making clear what we hope to accomplish. Firestone's program is not a "witch-hunt." It is an attempt to save valuable personnel before the latter stages are reached, where recovery becomes doubtful.

Actual experience has taught us the most important aspect of a successful recovery from alcoholism and other related disorders is the motivation to accept treatment, rather than the treatment itself. Industry has the most effective motivational tool known to date, that is, the desire of the employee to hold his job.

The key to the successful motivation of an employee with a behavioral/medical problem is to accept help and seek treatment lies in the supervisor's use of his authority in a fair and constructive manner. The supervisor must be armed with workable disciplinary procedures.

We recognize many influences detract from a person's effectiveness; particularly personal problems which affect him or his family. These may be problems of excessive drinking, drug misuse, or other behavioral/medical disorders which result in absenteeism or deteriorating job efficiency.

Job performance is affected by increased absenteeism, lower job efficiency, rejects, scrap, an increased accident rate, gripes and grievances, and more injuries. All these factors are money down the drain, at all levels of employment, at all times.

As behavioral/medical problems such as alcoholism advance toward the chronic stage, compared to the norm, the individual employee will: have 2 1/2 times as many absences of eight days or more; receive sickness benefits three times greater; have an accident rate 3.6 times higher; file five times more compensation claims; be the subject of garnishment proceedings seven times more often; be absent from the job 16 times more often; function at 67 per cent of his work potential; and be repeatedly involved in grievance procedures.

To be effective, every supervisor must: be trained to observe work behavior; know how to apply corrective discipline; avoid any references to drinking (This point must be emphasized time and again. The alcoholic is the professional when it comes to drinking. The

supervisor is the expert when it comes to job performance.); and, of course, they must know the policies and procedures for referral to treatment.

The procedure, or supervisor's actions, to be followed to implement Firestone policy has been kept as basic as possible:

1. Working with acceptable performance standards.
2. By means of continued observation, be alert to changes in the work and behavioral patterns of all personnel under your supervision.
3. Monitor and document performance, attendance and behavior. When they fail to meet minimum acceptable standards, or if individual's work seems to be getting sloppy . . .
4. Discuss the facts with the employee. Do not attempt to distinguish or diagnose the cause(s).
5. Inform the employee the services of our assistance program are available to help if a personal problem is causing his difficulties.
6. Contact the Employee Assistance Program office and give complete details of the employee's job performance or behavioral problem.
7. Refer the employee to the Program coordinator.
8. Check the employee's progress as it affects his attendance or job performance.
9. Repeat the process if necessary.

If the manager or supervisor refers the employee to the assistance program we will, in turn, inform them if the employee is cooperating in resolving his problem, etc. If the employee refuses help, if his performance remains unsatisfactory, if he or she has an occasional relapse, the suggested criteria for a decision is: "What action would be consistent with the way the company would handle the situation if this were some other chronic disease affecting attendance, performance, or behavior to a similar degree?" Using this criteria will also assure consistency in other decisions related to the program.

An employee's morale is greatly boosted when he realizes his company will take an interest in his problems and offers help rather than a mandatory stipulation of compliance. The result is: the employee may be restored;

the employer reduces financial loss; and the supervisor welcomes the help and becomes more effective in his job.

An additional by-product is improved handling of other behavioral/medical problems. Using our approach, one program covers everyone. No employee or class of employees enjoys special immunity from behavioral/medical problems. It is as prevalent in the executive suite as it is in all other job categories including middle management, line supervision, clerical, and production workers. Job performance deteriorates with the progression of these problems regardless of skill level.

Pre-treatment, to us, means case-finding or early identification of our troubled employees. By applying company policies and procedures, management, line supervision, medical, safety, and labor relations will accomplish this early identification by monitoring absenteeism and deteriorating job efficiency. More often than we realize, union stewards, family members, and fellow employees will bring cases to our attention when they become convinced that the objective of our program is to retain, help, and aid our employees and return them to full productivity. There are now, and there will continue to be, many self-referrals for assistance, as our credibility continues to grow. Quite often, courts and other law enforcement agencies will refer our employees to us for assistance rather than the usual punitive approach, which they realize seldom accomplishes anything positive. Still other employees will be referred through various auxiliary services.

Cases identified as job-oriented behavioral/medical problems are then referred to our program as represented by the Program coordinator. At this point, a determination is made as to what type of problem exists; some counseling will take place, if appropriate. Then the employee will be exposed to treatment, utilizing the alternatives provided in developed community resources for actual assistance.

As you can see, there is no limit to the scope of our Program except those we put upon it or the limitations in the community. We expect to use private physicians, hospi-

tals, clinics, Alcoholics Anonymous, Al-Anon, clergy, psychiatrists, psychologists, marriage counselors, institutions, social serving agencies, drug centers—whatever it takes to help our employees.

Under no circumstances are we trying to get into the treatment business. We don't treat illnesses in our Industrial Medical Center except on an emergency basis, so we don't intend to treat behavioral/medical problems any differently.

For those referred for help from outside the supervisory mechanism, such as a family member, friend, or fellow employee, we will guarantee anonymity for the caller and the person referred. If a person referred in this manner accepts our offer, help is given; if not, we politely back away.

For all persons involved with our program, confidentiality of records is assured.

Whenever possible, guidance and counseling will be made available to an immediate family member or legal dependent, because a behavioral problem afflicting a family member affects the employee's performance and general well-being. As one example, it has been stated that, on the average, an alcoholic will affect at least four members of his immediate family. The victims are sucked into a whirlpool and damaged or destroyed. The effects on our economy indeed grows and spreads as the ripples on the water when you throw a pebble into a pool.

It will be necessary to maintain a working rapport with the community social service agencies, and all other facilities that are available to our employees and their dependents for whatever problems they might have. To accomplish this, we must not only make ourselves acquainted with community resources, but become a part of community planning.

With our assistance program, we have a follow-up procedure that indicates to us, through the participating persons, just how

adequately they are being helped. This enables us to give valuable feed-back information to social service and private agencies to whom we are referring our employees. We, therefore, become actively responsible in upgrading existing resources and making recommendations for improvement.

Of course, to make maximum penetration possible, information regarding the program and its potential must be effectively communicated to all employees. This presentation is one method. News releases in the public press and the *Non-Skid* represent another method. Dissemination of Firestone policy and the procedures developed to implement that policy are still another. Explanation of program mechanics through letters, bulletins, memorandums, and other means will lower anxiety and speculation regarding involvement.

In the community, we can accomplish much through lectures to church, school, and social groups. The best means of advertising, however, is through positive feed-back from those having experience with our program.

At Firestone, we care about our people. We are vitally interested in intercepting the progression of behavioral/medical problems in the 95 per cent of the cases where the victims are still employed and employable. We know from experience that when a person first gets onto the track of progression, it's exhilarating, you feel that you are unbeatable, until you join others who are cracking up, wrecking their lives, and demolishing the lives of loved ones. There's only one way to help our people pull out of the rut of the well-worn and dangerous track which leads to total destruction, and that is to help them get into the winner's circle.

The victory won't be easy, but with your help, we can make it the win of a lifetime. Everyone involved in our program can share in the joy and happiness that being in the winner's circle brings. Yes, at Firestone, we care about people, too.

THE EXPANDING ROLE OF THE SAFETY DIRECTOR

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The basic approaches to safety in the plastics industry have changed very little in the past decade. We know just about as much about what needs to be done to protect workmen from accident and injury as we did five or ten or maybe even 15 years ago. We may be a little better at it because we're more practiced, but essentially there is very little on this subject that I could tell you that you would not already know.

What I think has changed in the past few years is the *role* of the safety director, not only within the plastics industry but throughout all of American industry, and it is this aspect of safety that I would like to explore.

OSHA, quite naturally, plays a big part in the expanding role of the safety director in industry, but it is only one segment of an infinitely more complicated story. But I am getting ahead of myself. Rather than starting with the conclusion and working backward, let us take a look at the beginning and travel forward from that point to where we stand today and what we can expect—and should be prepared for—in the future. In the past, on-the-job safety and health were generally considered subjects of importance in industry because of the potential adverse effect of accidents and occupational sickness on the running of the business. A bad safety record resulted in increased insurance premiums and workmen's compensation costs, greater down-time on the production line, etc. In all honesty, very few companies approached the problem from the perspective of the net effect on the workman himself.

As a result, the importance and effectiveness of the safety and health director was measured in economic, not human, terms, which was, considering the nation's general disinterest with problems of occupational safety and health, not regarded as an unrea-

sonable attitude to take at that time. As a nation, we have always had a propensity to establish a rather narrow set of goals and to focus our undivided attention on those to the exclusion of nearly all others. If we wanted full employment and a color TV set in every rumpus room, then the fact that a few workmen here or there got their fingers crushed in a stamping press was part of the price we had to pay, and we were, as a nation, willing to pay it. Now, I don't want to give the impression that this philosophy sat well with the average safety director. Maybe it did, maybe it didn't, but very few of us were in a position within the organizational structure of our companies or industries to do very much about it.

This state of affairs began to change rather substantially approximately a decade ago—in some companies and industries sooner—but in any case, long before OSHA came on the scene. In my opinion, the main reasons for this change were twofold. First, the social and political turmoil of the early 'sixties made profound alterations in the mode of thinking in the executive suite. Disturbed themselves at the way things were going in the country, many businessmen began to give more conscious thought to the reality of the concept of "corporate social responsibility"—a tidy phrase that had up until that time been primarily a corporate public relations man's wishful thinking rather than an active, ongoing business philosophy. As with most other profound changes in American industrial consciousness, it took a relatively long time to grab hold. Inevitably, however, the American business community came to apply the concept of social responsibility within its own companies and plants as well as without, although even today one still on occasion hears OSHA described as "tinker-

ing with the free enterprise system."

In my opinion, no finer example exists of this change in American business thinking than the simple fact that the Occupational Safety and Health Act was passed by Congress not over the bloody, kicking, and screaming carcasses of the giants of industry, but was instead tacitly accepted by the business community as an idea whose time had come. If anything, many of the moans and groans of industry today over certain provisions and requirements of OSHA are a direct result of a lack of interest in the Act when it was before Congress.

The second important factor that has influenced the role of the safety and health director was a basic turnaround in the attitude of organized labor with regard to the problems of industrial safety and health. As we all know, too often in the past labor leaders were far too willing to trade much needed improvements in safety conditions for an additional dime an hour in the paycheck. As this was normally the cheaper route to take, business generally acceded in these trade-offs. The basic change came when the average working man came to the conclusion, much to the surprise of the majority of labor leaders, that more money was not the sole answer to his fulfillment of the American dream. As one somewhat wagish social philosopher recently commented: America is the only country on the face of the earth where even the peasants have money.

With this general across-the-board achievement of at least a certain degree of financial security, working people and eventually even labor leaders began to direct their attentions to so-called "fringe benefits" in contract negotiations. Among these were such revolutionary concepts as the four day week, retirement after 30 or even 20 years, non-compulsory over-time, and other curi- osities. In many of these demands, the underlying concern of the workman was: Now that I've got some money to spend, I want time to spend and enjoy it. Inevitably, occupational safety and health became an element in the search for more free time. After all, retirement at age 45 is of little value to a man who is killed in a plant accident at 38. In this context, organized labor's push for a tough

federally enforced occupational safety and health act was essentially a grassroots movement by American workers who had sufficient money and now wanted to live long enough to enjoy it.

One more element ought to be mentioned here in our survey of the underlying causes of the expanding role of the safety director. We have already briefly looked at changes in business and labor thinking with regard to safety and health. There was, in addition, a national movement directed not specifically at safety problems, although this became a part of it in time, but a movement that can be summed up as follows: The United States became the first country in the history of the world that considered itself rich enough and progressive enough and secure enough to be able to devote its resources to solving the problem of making omelets without breaking eggs. I am, of course, referring in general terms to the cornucopia of sometimes interrelated activities that have come to be called the environmentalist or consumer protection movement. Whatever our feelings may be about the overall value of this movement, we cannot escape the fact that the concern generated by the various groups involved has been translated into a vast array of federal, state and local legislation designed to ride herd on the real and unreal excesses of industry. Much of this legislation is of more than passing concern to today's safety and health director.

In addition, if you do not believe that occupational safety and health is today an important concern in the environmentalist community, I might point out that both the Environmental Defense Fund and the Center for Science in the Public Interest have recently become heavily involved in the adequacy or inadequacy of certain OSHA standards. The philosophy of these groups seems to be: Working men and women are human beings and are as much a part of the environment as the fish and the birds and the trees, and as such are equally as deserving of attention and protection. I see this as a growing trend.

With all this introduction as background, it is high time we got onto the specifics of the safety and health director's role. Of course, at

And all of a sudden, money became no object. A safety director who one week had trouble pushing through a requisition for a dozen protective goggles was given a blank check the next. Even his title changed. He used to be the plain old safety manager. Then he became director of safety and health, and in some cases vice president for environmental control. He, in short, became a respected member of the corporate establishment.

Which brings us to his second function—that of management consultant. I am not talking about the outside professional consultant who comes into a plant and tells you what you have done wrong and how to correct it. I am instead referring to the former safety director, now vice president for environmental control, who sits in on the highest planning sessions in his company because his expertise has suddenly become of great value to those in the executive suite. Let me give you a couple of examples of how this works, and how in one instance it didn't.

In the past, very seldom did safety costs reach such proportions that they had to be taken into consideration in the corporate planning of such future activities as new plant construction, acquisitions, and the introduction of new product lines. Now, however, many companies have come to realize the tremendous cost involved in assuring compliance with the various occupational and environmental health and safety regulations issued by OSHA, EPA, and other federal agencies. Moving one step ahead, many have also come to the realization—and quite rightly so—that these so-called "environmental cost factors" must also be figured into all planning activities of the company.

Take, for example, the company that is contemplating the introduction of a new product line involving the construction of a new plant. In order to determine if the product will be competitive with similar materials already on the market, not only must the corporate planners include in their calculations the cost of constructing the plant, manpower availability, distribution systems, and other factors, but they must also take into account the probable cost of meeting occupational safety and health requirements as well

the top of his concerns is OSHA. It could be no other way. But the real question I wish to examine is not how has OSHA increased the safety directors problems, but how has it increased or expanded his function, status, and responsibilities within the corporate structure; secondly, what new specialties or areas of expertise has he had to develop as a result of changing conditions?

I would like to do this by examining the safety director's role in five general areas of responsibility: (1) the safety director as general; (2) the safety director as consultant; (3) the safety director as lawyer; (4) the safety director as doctor; and (5) the safety director as politician. Let us now look at them one at a time.

The role of the safety director as General is unquestionably his most important. It is the one that he is trained and qualified by experience and education to perform. In its simplest terms, the job is to protect the health and safety of the employees in his company. You may say, what's so different about this role from what it was five or ten years ago? The answer is relatively simple—concentration of power and expansion of responsibilities.

Within the past two years, not only has OSHA become a major concern in corporate circles, but the formation of the Environmental Protection Agency, with its wide range of sweeping powers to control industrial air and water pollution, also added to the burden. In most companies that decided to adopt a unified approach to these problems, the existing safety and health director was picked to handle the overall responsibility. In some companies, staff and technical personnel attached to the safety director's office increased seven- to ten-fold in as few months.

Depending upon the nature of the industry or company involved, the variety of professional skills required became staggering. The search became acute for qualified industrial hygienists, microscopists, noise and dust abatement engineers, solid waste disposal experts, and the list could go on. Because of the complexity of the law and its concern with occupational health as well as safety, doctors and even lawyers were sometimes added to the director's staff.

as air and water pollution standards. It would be foolish for a company to calculate the investment needed to produce a certain product at a competitive price, only to find half-way through construction that one of the raw materials used in the process has toxic properties requiring the installation of expensive control equipment, or that the solid waste from the plant cannot be dumped any closer than 40 miles away.

I know that all of this sounds so logical as to not warrant even mentioning, but the fact of the matter is that many companies in this country still have not recognized the need for environmental cost analysis in corporate planning. Let me give you a specific example of a company—one of the largest in the nation—that has had an excellent centralized occupational and environmental safety and health program for years, but which failed to call in their top expert at a crucial moment, and it cost them dearly. I am going to change the names and places involved to protect the company's reputation, but the example is true.

A couple of years ago, this particular company came to the conclusion that a particular natural raw material used in a number of its products was getting too expensive to purchase on the open market and that, over the long haul, it would be cheaper to find an available mine, buy it, and become its own supplier.

After some searching, a suitable mine was found in the desert region of Arizona. A team of analysts from the company was immediately dispatched by corporate jet to investigate the property. The safety and health director was not invited along. The team came back bubbling with excitement. The mine was a real bargain. The owners only wanted \$8 million and it was worth at least \$10 million and perhaps \$11. Not only that, but it had a processing plant alongside that they were willing to throw in for a pittance extra. Without a second thought, the deal was consummated.

In the normal course of events, a team of industrial hygienists and safety experts from the company's western environmental control laboratory were sent to the mine to take a look around. They came back aghast. The

place was a disaster. Not only did the mine not meet minimal Interior Department standards, but the plant, which fell under OSHA jurisdiction, had essentially no safety controls whatever. The final, crowning blow came when a routine analysis of the raw material showed that it contained such a high percentage of a certain toxic element that extra controls would have to be installed in those manufacturing plants that handled the material.

To date, the company has spent nearly \$4 million trying to clean up the mine, approximately 50 per cent of its original cost. As far as the plant is concerned, the safety director of the company admitted not quite in jest recently, that his only prayer is that an OSHA inspector won't have the stamina to drive a hundred miles across the desert to look the place over. I am sure that eventually the company will solve its problems and get the place into shape, but the moral has to be clear, and it is not: beware of bargains. Simply stated, it is: the safety and health director has a vital role to play in corporate decision making—a company excludes him only at great risk.

I mentioned earlier that in some centralized safety and health departments, lawyers have been attached to the staff to deal with the great variety of legal problems that have come to be involved in the regulatory and compliance procedures of the various federal agencies dealing with occupational safety and health, air and water pollution control, solid waste disposal, and other activities.

In most cases, however, the safety director has to act as his own lawyer. He has to know, for example, precisely what his company's obligations and rights are in the event of an OSHA inspection. If a citation is issued, he must know not only whether it is justified from the safety or health standpoint, but he must be familiar with the regulation involved and the options open to his company under the law. Furthermore, he must understand and advise his company on such things as waiver applications, proposed federal changes in reporting and inspection procedures, plus a multitude of other subjects and problems that were hitherto the private domain of the corporate lawyer. I am starting to find that the *Federal Register*, the *Occupational Safety and*

Health Reporter, and other Washington-based regulatory publications are as much a part of a safety and health director's life as are the standard technical journals of his profession.

The safety director as doctor is a role that I see increasing in importance by enormous strides over the next few years. Most of us are familiar with the basics of good safety practice and performance, but how many of us really know very much about the net effect on lung function of toluene diisocyanate inhalation? I'm not sure how much I know, but those of us in the urethane industry are working hard to get as smart as we can as fast as we can.

You may be thinking: the safety director doesn't really have to know very much about the health effect of a toxic substance—he only has to know how to measure and control it. If you're thinking that, I couldn't disagree with you more. In the first place, the safety director in his role as consultant must be in a position to advise top management on whether a proposed health regulation is not only feasible from the technical standpoint, but whether it makes sense from the health angle as well. Corporate medical directors and outside consultants are often considered by those in the executive suite to be over-protective of the employee in recommending company positions on proposed health standards, and it is often the safety director who is called upon to add a practical voice to the discussion. Obviously, he had better know what he is talking about in such a situation.

Besides needing a knowledge of the health standards proposed or adopted by OSHA, the safety director also must be keeping a close eye on medical research being conducted by an ever expanding array of governmental, educational, and private agencies and organizations into the health effects of products and materials his company uses or manufactures.

Among the federal agencies alone doing research work of one type or another on occupational and environmental health hazards of concern to today's modern safety director are the National Institute of Occupational Safety and Health, the various divisions of the National Institutes of Health, the Environmental Protection Agency, the Food and

Drug Administration, and numerous others. And these, of course, do not include private research institutions under contract to the government.

To give you some idea of the increasing attention being paid by the National Institute of Occupational Safety and Health to the problems of occupational health as opposed to safety, the 1972 President's Report on OSHA and NIOSH activities listed 207 research grants, contracts, inter-agency programs, and foreign research agreements either approved or underway at that time. Of the 207, less than a quarter were devoted to some element of safety, and most of these dealt with heat stress and industrial noise problems. Only three research projects were officially listed in the category called safety. Clearly, occupational health is a field to which the "safety" director will be devoting more and more of his time as the years go on.

The political role of today's safety and health director is a natural consequence of his responsibilities as management consultant, lawyer, and doctor. Because of his expertise in these areas, he becomes the logical choice to represent his company on the Washington circuit at regulatory and congressional hearings, as well as in dealings with the various federal agencies involved in occupational and environmental health. In many cases, he will be working with similarly trained and educated governmental personnel, such as those in the standards development and enforcement branches of OSHA. In some situations, he will, of course, only be part of a larger team effort, but in nearly all instances he will serve as a valued and valuable asset in representing his company in these often crucial matters.

I hope that these few comments and observations have given you some idea why I personally am excited about the expanding role of the safety and health director in industry. As a group, we have come a long way in a relatively short period of time. Our internal responsibilities have increased substantially, not to mention our status within our companies, and our activities in many new fields of endeavor have required that we expand our knowledge into relatively strange and exotic areas. All told, it is a fascinating picture, and

one that I see continually changing as industry places additional and perhaps heavier responsibilities on those accountable for the health and safety of the American workman.

THE NEW STATISTICS—PROBLEMS AND OPPORTUNITIES

By J. L. RECHT

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Let us look at the history of Z16 and the birth of the OSHA system. Work on the ANSI Z16.1 standard dates back to Bulletin No. 276, Standardization of Industrial Accident Statistics, published by the U. S. Bureau of Labor Statistics in 1920. Although developed by a body representing governmental statistical agencies, the rate provisions of this Bulletin were widely followed in whole or part by private agencies. At a national conference on Industrial Accident Prevention called by the U. S. Secretary of Labor in Washington in 1926, a resolution was adopted in favor of a revision of Bulletin 276 by a committee set up under the procedures of the American Standards Association (presently the American National Standards Institute). As a result of the work of this committee, the first edition of this standard was completed and approved in 1937 as Z16.1-1937. Since then this standard has been reviewed and revised.

It is important to note that the federal government and especially the Department of Labor played a major role in developing and promulgating Z16. It was endorsed and used by the U. S. Departments of Agriculture; Army; Health, Education and Welfare; Interior; Labor (including the Bureaus of Employment, Compensation, Labor Standards, and Labor Statistics); Navy; and others. The National Safety Council helped in developing the standard, but NSC's role has been primarily to use the system because it is the national standard. NSC has no vested interest in Z16 except insofar as it provides meaningful statistics on occupational accident experience, both current and historical.

The development of the OSHA record-keeping system in conjunction with the Occupational Safety and Health Act grew out of dissatisfaction with Z16 by some people in the federal government and in private industry. This dissatisfaction was partly due to a

misunderstanding of the purpose of Z16, namely, to provide comparison and trend figures for accident experience on an industry and national basis. Briefly, Z16 was designed primarily to provide external comparisons, whereas many people expected Z16 to furnish accident information that would be most useful for internal use within companies by safety engineers. This misunderstanding still persists. Another source of dissatisfaction was the apparent abuse of the Z16 system by individual companies. While there is no denying that there were abuses by some companies, it is also true that many stories were exaggerated and many others were incorrect because proper interpretation of the standard was not always fully understood. The Z16 system is an honor system, since there is essentially no provision for checking and supervision, and it has worked well on the whole. Those who feel that a mandatory OSHA system backed up by visits by compliance officers with the power to enforce the requirements will eliminate deliberate infractions have only to look at other laws and regulations to see that this is a vain hope. Those who intend to violate the system will undoubtedly find ways to do so.

Another source of dissatisfaction with Z16 was the reluctance on the part of private industry representatives on the Z16 committee to change some definitions. For many years there were efforts made to revise the definition of a "temporary total" injury. Many people felt that the definition should be broadened to include cases in which transfers were made to other jobs that were open and available. Perhaps if this and other similar changes had been made, Z16 would have been the system adopted by OSHA and there would be no alternative system in use.

It is helpful in assessing the two systems to look at some comparisons. As mentioned before, the purpose of Z16 is primarily external, that is, to compare companies, industries,

and to indicate trends. The purpose of the OSHA system is primarily internal, that is, it is designed to give information to the compliance officer when he visits an establishment to help him make a better safety inspection. With this objective, it is clear that uniformity in reporting is not important since the compliance officer is only concerned with one establishment at any given time. Because there are many more cases recordable under the OSHA system, there is more information available to the safety engineer on the establishment level, but the lack of uniformity is a serious drawback to the system since it does not provide for reasonably good summaries even on a corporate level.

As far as content is concerned, Z16 has a standard frequency rate, that is, the number of disabling injuries per million manhours worked. The OSHA system has a corresponding measurement called the incidence rate, which is the number of recordable injuries and illnesses per 200,000 manhours worked. The reason that 200,000 hours was chosen was to convert readily into 100 man years (100 men @ 2,000 hours per year). The incidence rate for a single year can therefore be interpreted as the percentage of the work force in the establishment that suffered a recordable injury or illness during the year. However, this interpretation can only be made on an annual basis—those companies using quarterly and six-month reports have already found that this seemingly simple translation of the incidence rate can be seriously misleading. Simplicity is often elusive.

The Z16 standard has a severity rate based upon a table of charges for permanent injuries and calendar days of inability to work for temporary cases. The days are totaled and the rate is based upon a unit of one million hours worked. The OSHA system has no corresponding severity rate. Severity is assessed by noting the number of fatalities and by counting the work days lost. The definition of a lost work day has been found to be unsatisfactory and will be changed when the OSHA system is revised. As it stands now, lost work days do not include all the days a person was unable to work due to injury or illness, but just those when he was *scheduled* to work and could not. Thus equivalent injuries may have

different numbers of work days lost. In addition, the definition requires that days be counted as lost work days in which an employee could not perform all the duties of his job (even if not called upon to perform them). The widely varying interpretation of the latter provision and the fact that the lost work day totals are not comparable to days lost due to strikes, shutdowns, and so on have made this measurement one of doubtful usefulness.

The Z16 standard has been in use for many years and its original purpose was to provide comparable information. Both in terms of design and experience, therefore, Z16 should furnish relatively comparable accident data. The OSHA system is new and its basic purpose minimizes the need for comparable information. As a result, the OSHA system both in design and experience cannot provide comparable data.

Similar statements can be made concerning the accuracy of measurements in the two systems. However, it should also be noted that it is usually much easier in any reporting system to have more accurate measurements when fewer elements are involved. There are fewer disabling injuries reportable under Z16 than OSHA recordable injuries, and thus much less variability under Z16.

For several decades national data on occupational accident experience has been obtained both by the Bureau of Labor Statistics and the National Safety Council, using Z16 as a basis. BLS sampled 40,000 companies per year, asking each firm to send back a form summarizing its accident experience for the period covered. NSC asked each of its approximately 10,000 industrial members to fill out a form giving their annual accident experience for the current and three prior years. Frequency and severity information was obtained.

The OSHA annual reporting is currently based upon 250,000 establishments (these are individual units and not entire corporations, unless the company has only one location) and may be expanded to more than 500,000 establishments in the near future. Coverage will be based upon size, with the larger establishments being asked to report each year while smaller units will have to report only

when selected by a random sampling process. Not all occupational accident and injury experience is covered by the OSHA Act. For example, public employees—federal, state, and local—are not yet under the jurisdiction of OSHA. Some industries are covered by special legislation and some industries, such as agriculture, present difficult reporting problems. This all adds up to questions of representativeness of the figures obtained in a large sample of annual reports. Some people have already misinterpreted the overall figures released for the latter half of 1971 as applying to all workers instead of just those covered by OSHA and included in the sample.

The timeliness of reports from OSHA on accident experience has been poor. We have yet to receive more than a brief summary of the 1971 data. This cannot be seen as a fault of the personnel in the Bureau of Labor Statistics, nor can it be blamed on poor computer equipment—BLS has access to some of the finest equipment available. It is simply an enormous job, and with budgets and priorities as they are now and likely to be in the future, there seems little hope that publication of federal figures can be speeded up very much even with the best of intentions. NSC has not had similar obstacles and can thus maintain our usual schedule of compiling and publishing the accident experience within six or seven months after the end of the year.

The figures discussed above are simply the summaries, that is, the information on the OSHA 102 forms. If detailed studies of individual cases were attempted using the OSHA 101 forms, there would be an expensive and tedious coding job required to convert the information into a format for computer processing. Unfortunately, this form, again, was designed primarily for use by the compliance officer rather than for producing statistics readily. NSC has revised the 101 form so that it is pre-coded, and we will test the form early next year.

Some of you may have been involved in the deliberations to revise the OSHA system at least with respect to specific definitions and redesign of report forms. The results of the revision discussion were minimal, and

there will be very few changes when the revisions go into effect on January 1, 1975. It had been hoped to make these changes effective next January, but there apparently was not enough lead time to enable everyone to be informed.

Both BLS and NSC are attempting to do what have been termed "cross-over studies," that is, we are trying to see whether there are any consistent relationships between the two systems or between some parts of both. In the NSC study we asked our members to report both their Z16 experience and their OSHA summary figures to us. A careful look at these data shows that there are reporting deficiencies in both systems, and most especially that there is a great deal of confusion in adopting the newer system. In the OSHA system first aid cases are excluded, but physicians do not accept the notion that physicians can render first aid. They say that any case, no matter how minor, that is treated by a physician is a medical treatment case and should be recorded. Thus, any establishment large enough to have a physician on call or a clinic nearby is likely to have a larger incidence rate, due to the inclusion of first-aid cases, than smaller or isolated establishments without similar medical facilities available.

At the present moment there appears to be a possibility of some relationship in some industries between disabling cases under Z16 and OSHA lost work day cases. However, there seems to be little hope of any consistent relationship between Z16 cases and total OSHA cases. NSC is repeating its request for both Z16 and OSHA information from its members, and by mid year we should be able to resolve this matter.

The future of the two reporting systems is not clear. NSC policy is to continue using Z16 (which is the national standard) at least until such time as the OSHA system is stabilized. How long this will be is an open question, since the OSHA revisions will not go into effect until 1975 and it may take some time to learn how variable the reporting is under the new rules. We feel (and there are many who agree with us) that the OSHA system needs revision to provide uniformity in reporting if it is to be used for generating national statistics. It is not enough to hope

that continued usage will ultimately provide the needed uniformity. What is needed is clearer definitions (even after the current revision), the establishing of an interpretations committee to rule on borderline cases, and publishing of previous decisions to furnish precedents that others may follow. Without

these changes we run the risk of gathering large amounts of information that can be at best misleading and at worst meaningless. It is my opinion that these suggested changes are not likely to be made in the near future, and we will have to do the best we can with what is available.

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