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Forest Industries Sessions AN APPROACH TO THE HEALTH MAINTENANCE OF FORESTRY INDUSTRY EMPLOYEES

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A better title might be, "One Company's Approach to The Health Maintenance of Its Employees," or, "How in The Heck Can We Know What to Expect From OSHA in Regard to Their Next Chemical or Safety Hazard Pronouncement?" I suggest that OSHA is not exactly sure what they do want next; so, therefore, good medical judgment and good common sense have a place in developing any health maintenance program. If you face your real problems directly and are sharing information about your program with each employee individually, you will maintain credibility. Any attempt to hide data can be a disaster. A famed statesman from our host state said, "Tell the truth, and you will never have to remember what you have said." Abraham Lincoln is said to have coined this phrase. With the expansion of knowledge and the ever-increasing amounts of scientific information, one cannot specifically remember each fact in detail that you are faced with daily six years later when you are asked to speak to a given group.

It is necessary initially to evaluate the risks to which your employees are exposed. It is not really appropriate to develop a space-age medical program when only some basic medical measurements are really required. For example, a test of the applicant's or the employee's ability to perform a manual job might better be a strength or mobility test rather than a manual dexterity test required for a job requiring precision hand-eye movement coordination.

In this evaluation, you should consider the potential routes for injuries in developing your program. In a chemical work environment, you may have skin contact or inhalation, but

very seldom ingestion. In a more mechanical environment, you will have more immediate physical dangers from axes, falling trees, or moving equipment. In other words, consider whether you have a potential systemic effect or a localized effect. In most cases, preventive thinking can help prevent injuries before they occur.

Another consideration has to do with hazards in regard to their toxicity. A very toxic material can be essentially non-hazardous if proper engineering designs have been implemented with the employee's personal safety training and awareness orientation. Occasionally, however, less toxic materials can become more hazardous because there is less concern and, therefore, sloppy or poor practices can evolve with the inevitable increased severity when accidents occur.

Perhaps your last consideration would have to do with the work location. There is a tremendous difference in woodlands work and the work inside a pulp or converting plant. Even woodlands can vary.

In any assessment of health maintenance programs, you should include safety. Safety is considered safety maintenance. You should also be concerned about preventive maintenance of your employees. These two go together hand-in-hand. The legs protected from the chain-saw with nylon ballistic cloth which prevents severe laceration injuries to the legs. The safety spectacles (with fixed side shields) which prevent the loss of an eye prevent untold psychological damages to a person. The hard hat that prevents the skull fracture and perhaps death also contributes to a more safe and healthy working environment in a much more dramatic way.

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FOREST INDUSTRIES SESSIONS

Health Maintenance of Forestry Industry Employees . . . K.D. McMurray, Jr. 3
Accident Investigation—Apathy? . . . James D. Young 8

PRINTING AND PUBLISHING SESSIONS

Environmental and Safety Considerations of Printing Ink . . . R. Mayer 13

TEXTILE SESSIONS

Use of Alcohol and Drugs by Textile Employees . . . Theodore R. Hatfield 17
Make It Happen for Safety . . . Norman L. Self 24
Officers of the National Safety Council Forest Industries Section . . . 29
Officers of the National Safety Council Printing and Publishing Section . . . 32
Officers of the National Safety Council Textiles Section . . . 34
Order Blank for Other Volumes, 1978 NSC Transactions . . . Back Cover

The choice of a program for health maintenance, therefore, is the result of these previous considerations. It is also related to the various legal requirements imposed upon us by OSHA and other regulatory agencies. Let's face it: there were only a few industries performing any serious mandatory health maintenance programs prior to OSHA. This is not to say that the work places were less safe. It was just the philosophy that mandatory examination programs were not successful. The unions did not care for them. The employees would be hesitant to provide all the information needed, and the companies did not like mandatory examinations because this might infer that a hazardous situation existed.

Voluntary health examinations have been a part of the American industrial health scene for many years. Participation has been good because most of these examinations were quality examinations. The results have been made known to the examinee by the examiner. The results have also been shared with the employee's physician. The shortcomings of such examinations is that the data was so individually oriented. There were no systems for analyzing the data as promptly as we can now with the new computer systems available in the market and also being developed by individual companies. This is the greatest advance in the assessment of data that the medical community has ever experienced. More about this later.

The second greatest contribution to data gathering has been the multiphasic blood screening test. Some have criticized these tests as adding to the cost of medical care by performing unnecessary medical tests without justification. But when I can get a serum analysis of 35 different chemistries as well as blood indices such as the red cell count, hemoglobin, and hematocrit for less than two blood chemistries used to cost back in 1969, I seriously question this. When I looked into omitting selected tests, I found out it would cost more to delete the information from the printout, plus they would run the tests anyway. Another observation that has influenced our thinking is that, sure as shootin', ten years from

now you are going to want to know what the blood calcium or phosphorus was on a certain group of employees. If you never did it, you will never know. But, if it is in the data bank, you can retrieve it.

The occupational physician's business is preventive medicine, and we must cover a broad spectrum of insults, exposures, and experiences of a large group of people. Any physician can treat a tonsillitis or perhaps set a broken bone. To me, that is purely mechanical. But, of course, some mechanics are better than others! Just as there are all types in our specialty. Criticisms have been cast upon occupational physicians as pawns of management. Perhaps in the earlier days of industrial medicine that criticism may have been warranted. We still have episodes where a chemical has been implicated as creating some adverse employee health effect. We are aware of the initial reports regarding dibromochloropropane (DBCP), but who is aware that studies are showing reversal in around 50 percent of those with problems? Are you aware that through industry funding, research physicians have found a way to eliminate kepone from the body and are returning those previously exposed individuals to a normal state? As long as we have situations such as these, we are going to have to search for the answers and the potential problems. The only way we can do so is by insisting on a safe operation from both a safety and industrial hygiene viewpoint. You will do more to prevent excess injury and illnesses by this method than any health maintenance program ever will.

A health maintenance program is really the frosting on the cake. It is the fine tuner that you can use to see that your basic program is safe and under control. Your health maintenance program should contain elements (or modules, as we call them) related to occupational exposures and hazards as well as safety-related data. An example of an occupational hazard would be noise. How are you going to evaluate a mobile working force? You must categorize your workforce, determine the work patterns, the

mine if there are any fixed noise sources, measure the continuous exposures, the intermittent exposures. You must use fixed noise samplers as well as personal sample monitors. All good and well, but you must also submit this data to your data bank where it can store the exposure index created by these data on each individual's medical record. All cutting, felling, limbing, or equipment operators will be categorized; and in this state, it will be submitted as representative for all in each category.

Your immediate concern may be: What if we don't have any base line audiometric data on these employees? There are two considerations. First, you may have an excess of hearing loss claims. You will get them sooner or later, and you might as well know now so you can prepare future contingency funds to pay for these. Second, you are going to have to start a program sooner or later, so you might as well assess your situation so you can make that decision now.

As a part of your evaluation of noise, an examination of the employee and a detailed questionnaire of the employee's previous exposures is required. This can be done by paramedical personnel; in some cases, even by non-medical people. Granted, this is not the best situation, but I have seen some excellent work performed by some mighty dedicated people.

The basic approach to any sort of medical program for employees starts with the assumption that your medical department or service has the confidence of your employees and is respected by these employees as being straight with them. In the event you are not this fortunate, it is necessary to develop a package of information regarding the program and discuss it with selected employees, including union representatives if present, to clear the air and gain support before you launch any program. If the employee has confidence that his or her medical data is confidential, that it will not be shown to management, that the contents will not be used against them, and you have a trained, quality registered nurse or physician, your program will be successful. Needless to

say, your facility should be clean, quiet, and provide the privacy needed to conduct any examinations.

The basic examinations, which are essential, are vision, audiometric testing, blood screening analysis, blood pressure, baseline electrocardiograms and x-rays, and pulmonary function tests. You might say this is too sophisticated for your operation. As I said, you must pick and choose according to the physical and chemical hazards present in your operations. If you are concerned about physical examining facilities, you should be aware that mobile vans are available now and provide all of the amenities fixed locations now offer (plus more, in many cases) at a very reasonable cost.

Some of your considerations will also revolve around workmen's compensation laws. It may be necessary to establish a total baseline of medical information in order to protect yourself against future claims. Certainly vision, audiometric, and cardiovascular considerations are basic to any assessment of an employee baseline physical information. One can expect there will be an ever increasing standardization of workmen's compensation laws and certainly an increasingly liberal payment of all claims. Certainly, the California cumulative trauma regulation which provides compensation for normal "wear and tear" over a working lifetime is going to cause all companies to look at their hiring practices in greater depth. This immediately might lead one to the conclusion that you ought to require back x-rays on all applicants or injured employees. From a medical point of view, this could be both good and bad. Good, in that it might permit the physician to make a more specific and precise diagnosis; bad, in that every employer might decide to take pre-employment back x-rays. This could create a tremendous excess of body radiation that could cause disease at a later date.

You can see the dilemma this may create for the physician. We tell our physicians their role is to examine and indicate any physical restrictions necessary. It is up to the personnel function to hire or to not hire, based on their ability to determine whether or

not the applicant can do the job for which (s) he is applying. Obviously, it is imperative that the physician be aware of the job and its requirements.

In most cases where the physician is not full-time, and in almost all cases where the physician provides services from his or her office only, you may have a problem. The physician is contracted to examine the applicant and advise management of any medical restrictions which would prevent the applicant from performing the duties of the job. The applicant provides consent for this transmittal as an entrance requirement. In no case is the individual's physical condition to be passed along to anyone outside of the medical department. This requirement for confidentiality is present throughout the individual's employment.

Physicians and the individual employees may cross wires on occasions, such as when the employee has a condition which, in the opinion of the physician, may require a restriction that might prevent advancement of the individual. This can be sticky. Hopefully, the rapport between the physician and the employee will permit enough exchange with his or her management to place the individual in a proper job without jeopardizing the individual's progress. In any event, if the employee does not allow the physician to discuss his or her medical condition with management, it should not be. In the event such placement would constitute a hazard or threat to others, I would place restrictions on the individual until I could obtain additional medical consultation on the matter to be absolutely sure.

Some might think my conversation has certainly strayed a great deal from the health maintenance program. But it really hasn't. Health maintenance begins as soon as the individual comes into our consideration, i.e., at pre-placement examination. We do not use the term pre-employment physical because more often than not the physician got the blame for an individual not being hired. How many of you have ever told someone, "I am sorry, we really liked you; but you failed the physical." Needless to say, we don't say that any more since our physical

examination is a part of a complete assessment of the applicant's credentials and capabilities.

In management situations, we now offer jobs to some prospective applicants in advance of a physical examination on the basis of a medical questionnaire which the applicant completes and forwards to the appropriate medical department. This is reviewed and approved for a job offer, or a requirement may be stipulated that a physical examination must be performed prior to an offer of employment. In the event permission is given to offer the individual employment, the applicant must then have a complete physical examination within two weeks of employment at the work location where the individual will report. If the applicant has answered the questionnaire falsely, and this is detected, it could be grounds for separation. To my knowledge, we have not separated any such new hires. We have found defects which are cause for concern, such as hypertension, diabetes, heart disease, hearing defects, and even leukemia. We attempt to turn this to our advantage by bringing it to the applicant's attention and seeing that appropriate treatment or evaluations are obtained. We then place a suspense on the individual to return to the Medical Department in some specified period of time for a follow-up. This has been very successful in helping to maintain our new employee's physical status.

Under normal circumstances, our program consists of a voluntary employee health screening offered on an annual basis. This is a refinement of our previous voluntary physical examination program which we used to offer every three years. With the necessity for having better information on all employees, a decision was made to initially offer annual screening testing to all employees. This consists of vision testing, audiometric testing, pulmonary function testing, blood screening, urine analysis, vital signs, and pertinent information such as social security number, date of birth, and work location.

Obviously, this information must be accurate. We insist that our techni-

cians be certified audiometric technicians by receiving training in the courses which are offered throughout the country. Pulmonary function testing does not require certification at this time; however, there are a number of courses where individuals can be taught the importance of quality control in spirometric testing. Certainly with the preventive medicine emphasis regarding lungs, this is probably one of the most important considerations for accuracy in testing that you will have.

The blood screening is provided by one laboratory for all of our locations. This is done for purposes of quality control and to develop comparable normal values which are meaningful for all locations. We are in the process at this time of analyzing our data to determine the normal values for our employees. These can be compared down to the department levels. Plants have their own printouts of the data regarding the normal values for that location. This allows us the capability of comparing a paper plant, a soap products plant, or a food products plant, or we can compare these with normals established by the laboratory.

As you can well imagine, there will be an abundance of medical information recorded on over 35,000 employees every year. In our first year, there were difficulties in starting up, and the times were staggered, but over 85 percent of the employees who were offered the Employee Health Screening Program accepted this screening. We anticipate that in future years our percentage of participation will increase — individuals who previously turned down the screening for various reasons, most of whom gave the excuse that they had just completed a physical examination by their own physician. We encourage our employees to use the employee health screening results to transmit to their own personal physician before they have their physical with their own doctor. We believe this way the individual will save money and the physician will receive some quality examinations which he is probably not able to accomplish in his own office. As you can see, we are encouraging our employees to see their

doctor. At least this way they get seen twice a year so, hopefully, we will prevent some disease from progressing too far.

Each employee's data is entered into a central computer bank. A printout is returned to the location with all this information. A duplicate copy is available in case the individual wishes the information to be forwarded to his or her own personal physician. We place a requirement that the personal physician must request this information. Unsolicited medical information creates a problem for physicians. Therefore, we do not send it unless the physician indicates he has an interest in seeing it. This is one way to maintain good relationships with your local physicians. You can well imagine in a community of 5000, 500 employees might have the same doctor. He would then be forced to review all of this data and make decisions based on the information contained therein. As time passes, we will add a continuing amount of data to this medical record. This will allow us to develop information on an individual, where (s) he worked, to what materials (s) he was exposed, so that in the future as questions develop regarding employee exposures, we will be able to analyze the data fairly promptly.

I mentioned the Employee Health Screening Program is performed on an annual basis. We still offer voluntary physical examinations on a five-, three-, or one-year basis. From ages 18-35, we offer the examination every five years. From ages 36-50, we offer the examination every three years. We offer the examination annually after the age of 50. The physical examination and baseline physical examination will include an electrocardiogram and chest x-ray.

Our computer program is designed in such a way as to be divided into modules. Each function or test is a module. For any additional information we want to add, it would call for the design of a module to be added onto the information which we currently have on hand. This permits the chronological addition of any new information, whether it be physical examination information or industrial hygiene or safety-related data.

ACCIDENT INVESTIGATION—APATHY?

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The thorough investigation of an industrial personal injury has proven to be one of the best training tools available to supervision. Yet, by and large, accident investigations are not used effectively. Why not? I think it's due to apathy—indifference, really—on the part of management.

Even though supervisors are well aware of hazards existing in their departments and they make periodic safety inspections to keep the hazards under control, there will be accidents involving personal injury. The reason that accidents do occasionally happen is that there is a culmination of events that are unforeseen, unplanned, and result in an accident and possible personal injury. This culmination of events can result from the working environment, including machines, tools, equipment, and various liquids that are sometimes needed in the operations. The culmination of events can also include personal factors of the employees operating the equipment and machinery, as well as transporting and moving parts either in process or manufactured.

Keep in mind that effective supervisors are effective because they are well aware of the methods, procedures, and operations in their departments. They also use the same managerial skills used in the production efforts and relate them to the safety effort.

When accidents involving personal injury do happen in a particular department, that supervisor, by going through a thorough accident investigation, generally will find new hazards and sometimes procedures and methods that have to be changed to protect the employee from being involved in an injury.

Most supervisors take the job of supervision with the full understanding that they are responsible for the

production and efficiency of their employees in getting the work assigned to them completed. They take the job of supervision unaware of their safety responsibilities and what will be expected of them when it comes to safety efforts.

To help the supervisor understand what is expected in safety, there are certain questions that managers must answer:

1. What, specifically, should the supervisors do?
2. What specific actions should supervisors use to assure that they will genuinely control safety in their departments?
3. What can supervisors effectively do about safety?
4. What must supervisors learn in order to do it?
5. Do we expect supervisors to take a scatter-gun approach to safety or to zero-in on safety priorities?

These questions do not imply that we expect supervisors to become safety engineers so that they will build machine guards, that they will be responsible for designing the danger out of machinery, that they must determine the noxious qualities of materials processed in their departments, or supplies used in the processing. We certainly don't expect them to be able to establish weight loads for the various floor areas or other operational limitations for equipment used in lifting or moving of material. They can't be expected to design safety equipment and clothing for operators. What it boils down to is that they need not be an expert in many of these areas.

Supervisors must be concerned with application: that is, how employees do their particular jobs using the methods, equipment and machines available to them. This does involve responsibility for recommending changes in the machinery and meth-

ods, or both, if unsafe to proceed for the operator. We do further expect the supervisor to inspect his area to make suggestions and recommendations, and certainly they must train and motivate employees in production as well as safety.

I have a strong feeling, and it's been checked at numerous plant locations, that supervisors do an extremely poor job at accident investigations simply because no one really cares what type of job they do when investigating an accident. In many firms, as long as some type of form is filled out which includes the injured person's name, the date, the injury, and possibly the cause of the accident, that's all that matters. Everyone seems to do those things on their jobs that are of concern and important to their superiors. Industrial supervisors are no different than any other person in the management structure. They will do those things where they are measured, where there is some indication that someone reads what they do and uses the information.

Part of the reason I feel that supervisors do an extremely poor job at investigating accidents is that they simply do not know what to look for. The lack of knowledge in accident investigation doesn't hold true to industrial supervisors. Many people involved in safety work have used the title accident investigations for years and are not really doing a very good job at investigating accidents. The investigation forms give a pretty good indication of why supervisors are not doing better investigations. Most accident investigation report forms that I've seen have asked questions such as date of injury, injury or alleged injury, a description of the accident, and other questions about equipment malfunction and damage to equipment or property. Most report forms also include a question of what caused the accident and what will be done to prevent recurrence.

Using these report forms as examples, we can see some of the problems that supervisors have when it comes to filling out this type of form. Some forms are long and involved. A sample I have from the National Safety

Council's *Accident Prevention Manual*, 7th Edition is also found in the Council's *Supervisor's Handbook*. I get the feeling when I look at a form like this that whoever devised it and put it together does not have a real feeling or understanding of the supervisor's job. The question is: When does a supervisor find the time to get all the information asked for on a form like this? We must keep in mind that management is very, very concerned about the production effort. They want the materials processed. They want the job completed and the goods out the back door so there can be a profit. Taking valuable time away from the production efforts by having a supervisor trying to find all the information asked for in a form like this is part of our problem.

Referring to H. W. Heinrich's book *Industrial Accident Prevention*, he has an example of a supervisor's accident investigation report that is also very involved. Generally, in all these supervisor accident investigation report forms, when we're looking for unsafe acts, unsafe conditions, and unsafe personal factors involved in the accident, we need fairly easy solutions in most cases. Supervisors find it very easy to say that the employee did not follow instructions, disobeyed orders, was careless, wasn't thinking, daydreamed, and all kinds of excuses as to why an injury took place. In almost all cases, when a supervisor can identify one unsafe act by blaming the employee, one unsafe condition that he probably didn't have any control over, and an employee with an improper attitude or other personal factor involved, he has done his job as far as accident investigation is concerned. He's filled in the blanks. Someone in the organization can file a supervisor's accident investigation report of a particular injury. The job is complete. But then again, does it really matter to anybody? Is anybody concerned that he should do any different than this?

I think what we have to do is to take a good strong look at our managerial structure and try to identify, when we're making accident investigations, those areas where management

has made some misjudgment, error, or mistake, not just as it relates to safety, but to the whole organizational structure. We have not used all the knowledge available in safety over the years.

Recently, I was looking at a book entitled *Safety and Production*, published by the American Engineering Council in 1928. The Council had questions in this book such as: Can industrial accidents be controlled under modern conditions of production? If so, how? Does safety interfere with production? The Council went on to answer these three questions as follows. "The answer to this group of questions is clean-cut and positive. Industrial accidents can be controlled under modern conditions of highly efficient productivity by the same managerial skill that controls production itself."

By using the same managerial skill that controls production itself, which we knew 50 years ago, management can control industrial accidents. What does this really mean? Well, let's just take a look at a quality control problem in any organization. It is not just investigated, a few blanks filled in, and the report filed someplace. There is great concern, and it matters to everyone in the organization that quality must be good or the products don't sell. The service doesn't sell. A search goes on. There is an investigation as to the causes of why the quality is not at its best. Managers, using the skill they have, will look for root causes of the quality problem. They look back at the materials purchased, the equipment used, the training of the people, the selection of people, hiring practices. They will do everything in their control to get the quality problem straightened out. This is also true of scrap control, of high turnover, of production problems. Management does an excellent job of investigating those areas to find the real root causes and then take corrective action. Supervisors don't do that when it comes to accident investigations, nor, for that matter do safety personnel, in most cases.

I don't think we can say that accident investigations don't matter or are

of no concern, although I found it to be true in too many cases. It's still our job to motivate those people in our organizations who have hold of the purse strings. Not only is it humane to prevent accidents, it's a very important part of the organization as far as cost savings are concerned.

What do we mean by root causes? Well, let's take a look at our supervisors' accident investigation reports. We're identifying things, we're identifying unsafe acts, unsafe conditions, personal factors: we're not identifying those things that managers would identify in any other managerial function in the organization. Why not use the same managerial skill as stated in 1928? Those are the same managerial skills that control production itself and the same ones to control industrial accidents. Let's look at accidents from the standpoint of what training the company really has and what training might be recommended. This would include supervisory training as well as employee training. When we have a technical job in an organization, we train the person to do the job correctly, but very few times do we find an ongoing safety training effort.

OK, let's look at this from a positive standpoint. Let's look at the root causes of accidents. Let's look at the selection process of employees, the orientation of the new employee into the organization, the initial training they get. Let's look at awareness programs, procedures, methods, with safety in mind. Let's investigate accidents with the idea that we're going to find the real reasons, not the fact that the employee was "firing" improperly. This doesn't tell us very much. What we have to know about that fact is: Had the employee ever been instructed on how to lift properly? Had the supervisors been instructed on how to lift properly so they could pass it on to their employees? Are they ever taught how to use their ladder properly? How to place it? How to get up and down the ladder using both hands? Are they ever really taught these things? Are supervisors ever taught what to look for in their departments? We tell

them to inspect their departments periodically and find hazards. What are they going to look for? What is a hazard? Who conveys this information to the supervisor?

There have been many studies made and certainly there are studies going on today as to what are the basic accident causes. I think we should look at some of these basic accident causes which are often responsible for, contributory to, or involved in practically all hazardous situations. Let's ask these questions: Why was there poor housekeeping? Why was improper use of tools, equipment, and facilities allowed? Why was unsafe or defective equipment and facilities used? Why was there lack of proper procedures for this operation? Why was it necessary to improvise and use unsafe procedures? Why did the employee fail to follow prescribed procedures?

Why didn't the employee understand the job properly? Why was there a lack of awareness of hazards involved? Why was there a lack of proper tools, equipment, and facilities? Why did the machine lack guards or safety devices? Why wasn't the employee wearing protective equipment or clothing?

Why did the employee have to exceed prescribed limits, loads, speeds, strength? What is there about the job that causes inattention, neglect of obvious safe practices? What was the reason for fatigue, reduced alertness, hypnosis? Why is misconduct allowed? What causes the poor attitude?

These questions, and many others similar to them, must be answered from the standpoint of where management failed. Generally, we are not searching for those management oversights or errors to find the real causes of accidents. Instead, we need to look at the multiple causes of accidents. Multiple causation is what we're really trying to bring out in thorough accident investigation. We can't just say the employee was unsafe or the equipment or materials was in an unsafe condition, and let it go at that. Employees just don't know. We can't let it go at that. We have to answer the 16 questions. Why do these things happen? Search back. We are not go-

ing to prevent this same accident from happening again unless we find the true causes.

OK, then, let's just go back over some of these thoughts and see where we've been, what we've tried to accomplish, and what we hope you try in the future. Let's say that the information I have gathered, searched out, is legitimate information. Supervisors in those plants that I've checked are not doing a very good job at accident investigation. Management personnel in most of those organizations really couldn't care one way or the other. Now this could be from lack of knowledge on the manager's part or lack of knowledge on the supervisor's part, or plain lack of knowledge by the safety personnel or industrial relations people.

I feel that the companies that I've worked with just don't know what to look for. Yet, generally we haven't done a very good job of explaining what we mean by accident investigation. Thus, there's apathy about accident investigation and it is quite universal. Very few companies have really taken a good hard look at safety areas as profit centers. Benefits, medical expenses have all gone sky high. This causes workers' compensation rates to go up. Now, if we can do a good job at accident investigation, find the real root causes, and prevent accidents from happening in the future, we should be able to show a great savings in the workers' compensation area. We in safety haven't always done a good job of bringing the cost savings to the attention of management personnel. I had one vice president of finance in an organization tell me that workers' compensation is a fixed expense. They budget so much for it every year and that's what they expect to pay. There was no way they felt they could save any money on having a better safety program. Well, after a lengthy discussion with this gentleman, explaining rate structures and programs that he could get involved in to save some money, he became aware that there is money to be made in safety.

Let's be more positive about this. Let's say that industry must con-

concentrate on efforts that will pay off in a reduction of accidents simply from a dollar and cents standpoint. There is no manager in industry today that would ever say he doesn't care if employees get hurt or could care less if somebody loses an arm. They are very concerned about the human aspects of safety, but that hasn't stopped a lot of injuries simply because of the lack of knowledge of what to do about preventing accidents. Let's go back to our organizations. Let's take a look at the supervisors' accident investigation report form that we're now using. Let's see if we can't devise it in such a way to make them look for those factors, those causes that will get back to the real root causes, even to hiring practices, to selection of employees, to placement of employees. I know there are some rules and regulations on a lot of ways to do this. We must put some emphasis on placing people on jobs that they're able to handle, at least at the beginning. We can do a better job from that standpoint.

Let's take a look at our procedures, the methods that are being used in the organization. Let's take a good

hard look at the training practices that are being utilized at the present time. What is being used as far as safety training is concerned from top management on down to the newest employee? Everyone should be given some knowledge of safety. On our accident investigation forms, let's report that there was lack of training as a possible cause, lack of knowledge as far as using hoists or ladders, or what have you. Let's not try to blame employees, but let's try to find where in the management structure there's a failure. Where has management possibly erred as far as this particular happening is concerned? We can bring out these real root causes, bring them out in the open, show management in a managerial way that this is a failure, and that it is something that has to be corrected just as you would correct anything in quality, production, scrap control or what have you.

Let's use those same managerial skills, as stated in 1928, the same managerial skill that controls production itself. Let's use those skills to control personal injuries in industry.

Printing and Publishing Sessions ENVIRONMENTAL AND SAFETY CONSIDERATIONS OF PRINTING INK

By R. MAYER
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If you are like me, you view this whole area of environmental safety and health with a growing sense of confusion. Certainly the growing Federal regulations of air emissions, wastewater discharge, noise, and use of resources has had its impact on all of the printing industry and has not helped this situation.

For many of us in the printing industry this is a rather recent event, for in the past technical people like myself have sought, although not always successfully, challenges to our ingenuity, creativity, or professionalism in other areas. Now we find that the innovations in the printing, publishing, and packaging areas require a response from us that not only solves our particular customer's problem but also complies with a whole list of new legislation.

Just in the last two years, we have seen major areas of our activity come under increasing Federal control with the passage of the 1977 Clean Air Act amendments, the Resource Conservation and Recovery Act, the Toxic Substances Control Act, the Safe Drinking Water Act, and the new Clean Water Act. The impact of these new statutes is so vast that we simply cannot afford to ignore their implications.

As an example, among the products used in printing ink we can account for approximately 1,000 different materials which are used in some way, shape, or form. Many of these ingredients are unique in the characteristics they impart to our products, and substitutes for them are usually not very easy to come by. Now we are finding that we have to compromise with what may have been the ultimate

technical solution to our customer's needs to comply with a safety or health feature.

Perhaps the areas of greatest concern to us are air pollution, hazardous and toxic chemicals, and solid waste disposal. I realize you may have significant concern in other specific areas, but I believe generally these are the areas of most general significance to us.

I must assume that the group has interests in all phases of the printing business. Needless to say, each section of the printing industry has its own set of problems.

Printing ink is, as you may or may not know, one of the world's oldest manufactured products, historically going back to ancient cultures. For most of that period to the present, printing ink was formulated using very simple vehicles, oil, and pigments. This is not the case today, for printing is no longer a simple process. Instead it is an extremely technological industry with many complex ramifications. This development has required simultaneous advancement in printing ink technology to meet the ever increasing performance demands. These demands have brought about the development of many new materials developed from advanced science, and these ingredients have required a much more sophisticated approach to their application.

There has in recent years also been a growing effort among industries to provide a safer and healthier occupational environment for all their employees. This has been strengthened, as I mentioned before, with legislation aimed at protecting the worker, the consumer, and the public.

Many manufacturers, among them those making printing inks, have also taken steps toward self-regulation to reduce even further any potential hazards which might be inherent in their products. There is also concern that all current and pertinent regulations which might be applied to their products are complied with. I should state that any hazards inherent in printing inks are normally small and can usually be minimized by proper handling. When the particular properties and composition of printing inks are known they should not present a problem to health or property.

But again I return to that point about chemistry. Remember that printing inks are chemical products and thus must be treated in a similar manner as you would any other industrial chemical. This statement is not meant to frighten anyone for, when correctly handled, printing inks do not present any undue hazard level in use. There are, of course, formulations of printing inks which may require special handling procedures because of their particular characteristics, but in the main, most problems arising from ink products can be avoided if printing plants take proper precautions to provide certain safe procedures.

Some of the things that we in the ink industry* generally recommend are:

1. Maintain good housekeeping throughout the plant.
2. Eliminate handling abuses and carelessness in the working environment.
3. Make sure employees are properly instructed and supervised as to the precautions that should be observed relative to possible hazards in specific ink systems.

What do I mean by specific ink systems? Well, just as there are a wide variety of major printing processes such as letterpress, lithography, roto-gravure, and flexography, there are as many if not more ink systems which go with each of these various printing processes. As an example, if we talked in terms of volatile products it would seem that inks or systems such as roto-gravure and flexography

utilize solvents which are in many cases classified as red label, and these should be considered potential fire hazards and handled accordingly. On the opposite end of the spectrum are letterpress or offset inks for newspaper printing. By and large, these inks contain materials which are predominantly non-volatile, have extremely high flash points, and generally present no acute fire hazard. On the other hand, there are inks which, due to their composition, are mildly alkaline, and for this reason we recommend that contact with skin be avoided as irritations may occur.

As a rule however, the printing ink and printing industry does not use extremely harsh chemicals. The majority of the industry is concerned with a blending of already available materials. I say the majority because there are some exceptions. However, by and large, an ink manufacturer takes materials which are already reacted and in a final chemical state, mixes them together, and disperses pigments into them to produce printing inks.

There are of course specific guidelines* suggested by NAPIM for handling of printing inks. What are some of these guidelines, and what do they effect? First is concern for safety and health of the eyes. Protection of the eyes is an extremely important element of any safety guideline. Obviously, the eyes are the most easily irritated or damaged, and we feel that particular care should be taken to prevent ink from getting into them. The most common way printing ink can reach the eyes is when an individual rubs or touches them with ink-stained fingers. There are occasions, however, when ink can be thrown into the eyes by the fast moving rollers of the printing press or as splashes from buckets. Needless to say, whatever the reason or the source, when printing ink enters the eyes it should be washed out promptly and thoroughly with clean water. Any subsequent irritation or problem which results should be reported immediately to plant medical or first aid personnel for first aid treatment. Like any health problem, the importance of

medical help can not be over-emphasized.

How can you help protect your eyes? Well, in printing operations where ink—and, even more importantly, solvents—splashes or sprays can be expected, we recommend that splash-proof goggles be provided and their use enforced. If the potential hazard is great enough, employment of full face shields may be advisable. We in our plants have very strong eye safety programs, and we very rigidly enforce wearing of protective safety glasses in certain lab or manufacturing areas. Anyone venturing into these areas must wear the glasses or he is forced to leave the area.

Skin protection is another area which should be considered, particularly if the ink systems contain any alkaline or mildly caustic materials or if they contain extremely strong solvents which could produce skin irritation. In any case, prolonged or repeated contact of printing inks with the skin should be avoided. I mentioned a specific case, but all contact should generally be avoided. While we feel that the health hazard is minimal because actually the skin is less susceptible to injury, prolonged contact can cause inconvenience and discomfort by causing localized irritation. Employers should be aware also that some workers may be more sensitive than others to certain ink formulations. This requires them to take extra personal precautions or to be shifted to other work areas. The effect of normal exposure can be reduced significantly by frequent washing of exposed skin with mild soap and water or waterless hand cleaners. Where there is no hazard due to moving machinery, and that should always be considered, or where they do not over burden the employees, gloves and long sleeve shirts should normally be worn, as well as protective clothing. However, clothing which has been soiled by large deposits of inks or wetted by solvents or other pressroom chemicals should be removed immediately and thoroughly laundered before being worn again.

All areas containing equipment or machinery in which printing inks are

handled, such as benches, mixing equipment, etc., should have adequate ventilation for dust or solvent removal. In addition to providing adequate ventilation, exposure can be minimized and inhalation of printing inks or their components avoided through the use of appropriate respiratory devices. Inhalation can occur of ink particles, dust, fumes, or solvent vapors. Such exposure must be kept below the levels prescribed by OSHA. Food and drink should not be stored, prepared, or consumed in areas where they may be exposed to printing inks. Workers should be required to wash their hands thoroughly before eating, and eat away from the work place. This is an area which is probably a gray area, and I have seen in certain shops where people have certainly eaten in the pressroom and around ink-handling systems. In our particular case, in the laboratories it is forbidden, as a rule, to eat on your bench; you must go either to a separate area or cafeteria.

Again, most of these guidelines apply to the general use of ink, but there are some special applications where special care is recommended. Specifically, these are reactive ink systems. Most ink systems are virtually un-reactive, and they dry by conventional methods. I am not technically correct, because obviously oxidative processes with drying oils would be considered reactive systems, but they are not strongly reactive systems. However, there are inks on the market today which cure dry by chemical reaction, which means they are generally more reactive than the more traditional printing inks. Such classes of printing inks include epoxy-amine systems or acrylic systems cured by UV radiation curing systems or what we would call two-component urethane systems. Generally, these reactive systems should be judged as potential sources of irritation, and special care should be taken to minimize exposure by inhalation and skin contact with such inks. We recommend the use of protective clothing and gloves, and the application of barrier creams is suggested. Workers who come in contact with or are ex-

posed unduly to such inks should follow the same protection measurements as with more conventional inks.

Another area of interest is the area of waste disposal. I know most of you are concerned with safety; however, I believe many times you do become involved in this and you are involved also in loss prevention, which directly relates to this area. We are told that American industry produces an estimated 350 million tons of waste annually. Some of this material relates directly to products which we formulate and market. It seems ironic to us that the pollution controls we as an industry have been required to install actually caused a good part of our growing solid waste problem. Much of it you can't burn; air pollution laws forbid that. You can't dump it into the water; water pollution laws prevent that. So now, as in the past, we dump it in or on the land. There are presently 100,000 industrial dump sites, including land fills, open dumps, surface impoundments, ponds, pits, lagoons, and land spreading. Some of these operations are the safest that can be devised, given our present state of technology, but others can and have led to environmental and health problems, including the leaching of materials into ground waters, streams, and drinking water supplies, and the leaking or exploding of drums or chemical waste and the spreading of infectious disease.

If you now dispose of waste at an open dump, prepare for change. By 1983 all open dumps, i.e., all disposal facilities that create a reasonable chance of health or environmental damage, must be closed. All waste must then be placed in sanitary land fills. The states are now beginning to classify the existing solid waste disposal sites. States are anticipated to assume prime responsibility for hazardous waste if they develop similar controls. These programs should be in place a year from now. The burden will be on us to document all hazard-

ous waste that is generated. This waste will have to be specially labeled, and they will have to establish a cradle-to-grave tracking system, called a manifest, to assure that all hazardous materials are delivered only to approved treatment, storage, and disposal facilities. The manifest form will identify the hazardous waste quantity and composition as well as its origin, routing, and destination.

After regulations take effect, no hazardous waste can be generated, transported, treated, stored, or disposed of without permission from EPA. Those of you who do business in New Jersey are already confronted with this system. Those of you who do business in Minnesota will face a more stringent system in the future. The rest of us have found that more time has to be devoted to this area. Of course, unfavorable publicity on this situation only provides greater emphasis to enforcement of these programs, as witness the chilling example in the Love Canal section of Niagara Falls, New York.

We in the printing ink industry are often at the mercy of both our customers and suppliers. Our suppliers don't always furnish us with the quantities of materials we need, nor do they always tell us the exact composition of those materials. On the other hand, each advancement in our customer's printing process, each new piece of equipment, each addition to the list of materials which can be printed upon requires changes in the formulation and manufacture of printing inks. Not only must we deal with pressures to respond to these changes, but we now find ourselves limited as to the choice or response we can make. This is a fact of our business life. From our perspective, we have no choice but to get concerned now if we are going to avoid panic later.

**Guide Lines for the Proper Handling of Printing Inks. NAPIM © 1976.*

Textiles Sessions

USE OF ALCOHOL AND DRUGS BY TEXTILE EMPLOYEES

By THEODORE R. HATFIELD, MD
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When I was asked to make this presentation I blithely assumed that there would be an abundance of information relating to the subject. Unfortunately, this did not prove to be the case, and I have assembled this presentation on information available on industry in general and expanded it as much as possible from informal surveys and discussions with textile company medical nurses, insurance company medical departments, state occupational program consultants, safety professionals, clinical psychologists, and others interested and working in the field. Most of the information has come from scientific studies and publications that appear to me to be objective and valid. I will attempt to develop the subject by going through the following steps.

First, I would like to discuss the incidence of drug use in industry in general and expand this into the textile industry by information obtained by a survey of personal observations by occupational health nurses working in the industry. Next, I will discuss the acute and chronic effects of the use and abuse of commonly used drugs and their safety implications. Lastly, I will discuss what resources are in use and available to attempt to cope with the problem of drug use.

A nation-wide study completed by the National Institute for Drug Abuse in 1974 was drawn from a group of males between the ages of 20 and 30. The group was chosen because it was initially thought that this group would represent that group which, because of their experimental nature and economic advantage, generate the most productive data in identifying the scope and magnitude of drug use. I have

used this group because I think it represents the group entering the industrial workforce and will be the group that industry will have to cope with over the next decade. In considering prevalence and past use of tobacco, alcohol, marijuana, psychedelics, stimulants, sedatives, heroin, other opiates (morphine, cocaine, methadone, etc.) and cocaine, it is of interest to note the following relationships between experimentation and eventual use of drug:

Substance	Experimentation (per cent)	Use (per cent)
Tobacco	70	60
Alcohol	97	90
Marijuana	55	40
Psychedelic	22	7
Stimulants	27	11
Sedatives	20	8
Heroin	5	2
Other Opiates	32	10
Cocaine	10	5

In studying frequency and severity of drug use, it is again of interest to note the following relationship between experimentation and frequent use:

Substance	Experimentation (per cent)	Heavy Use (per cent)
Tobacco	88	60
Alcohol	98	41
Marijuana	55	10
Psychedelics	22	0
Stimulants	27	2
Sedatives	20	2
Heroin	5	2
Other Opiates	32	2
Cocaine	13	0

What this information is saying to

us is that after experimentation with tobacco, alcohol and marijuana, a significant percentage of this population becomes heavy users and can be expected to maintain their use until some adverse action occurs that requires intervention. The observation with heroin is interesting in that it is a common idea that heroin use almost always results in heroin addiction. This does not seem to be the case.

Next is a comparison of whites and blacks on lifetime drug use by year of birth. The difference in incidence does not appear to be statistically significant except for heroin and cocaine, whose use among blacks is markedly higher. It is not possible from the data to determine why there is this difference, but availability would seem a likely possibility. In a study of availability of these drugs to the men in the study, heroin was the most difficult to obtain. Tobacco and alcohol were not considered as they are assumed to be universally available, although this cannot be said about alcohol due to restriction to sales by some state statutes.

A study of lifetime drug use by size of city of residence to age 18 attempted to show the relationship of exposure to drug use during the formative years and lifetime use which with this group really ends at age 30. The size of the city has little effect on the use of tobacco and alcohol. In general, there is a gradual decrease in the use of marijuana, psychedelics, stimulants, sedatives, heroin, other opiates, and cocaine as the size of the city decreases. It is important to note, however, that there is some use of all drugs no matter how small the city, and this happens in spite of the fact that some drugs are difficult to obtain.

Lifetime use of drugs by current employment status and the effect of employment on drug use quite strikingly demonstrated that the difference in drug use between the total group and the unemployed group is statistically significant, especially the effect of unemployment on drug use other than tobacco and alcohol. Most of the drug categories show doubling of use, and heroin shows a three-fold increase. One is left with the question as to

which causes the other. Are these people unemployed because of the effects of their drug use, or are they using drugs because they are unemployed, bored, and looking for a way to fill their empty hours? My personal experience with heroin addicts indicates that unfortunately the former is the case with this group, especially the hard core addict. I cannot speak to the other drugs as their users are more difficult to identify in our setting.

In studying per cent of users reporting bad trips, fights, highs, memory lapses, and dependence, the safety implications with these types of events should be obvious. Bad trips are most common or expected with the psychedelics, but are not uncommon with heroin and alcohol. The flash-back phenomenon noted with some of the hallucinogens such as LSD was especially dangerous, and although these drugs have decreased in popularity because of this reaction, some of the psychedelics still can cause hallucinations. Fights and other disruptive behavior were noted most commonly with alcohol and sedatives, and this is to be expected with those drugs since sedation removes the inhibitions that control social behavior. Highs of more than one day's duration were most commonly noted with stimulants, psychedelics, and heroin.

One of the events that has the most serious potential from a safety point of view is memory lapses. The most common drug causing this is alcohol, followed by sedatives and psychedelics. This would be expected to occur with a considerable degree of intoxication and to be relatively rare in the workplace. But its effect in motor vehicle accidents is known to everyone.

A most important piece of information reflects those people who have become dependent on the various drugs. The percentage that stands out is the one for heroin of nine per cent. It should be pointed out, however, that this really represents only about two per cent of the total population questioned. The largest number of people actually involved is for alcohol and marijuana. A surprising percentage is the three per cent cocaine, and this is probably low as cocaine has increased

in popularity since this survey was performed.

A study of the per cent of users who perceived benefits from drug use and their perception of overall life effect shows us only two significant effects, the first being the perception that tobacco and heroin have overall bad life effects, and second, that marijuana was the drug perceived by its users to have a good overall life effect.

As far as specific drug use among textile employees is concerned, I do have some information on the use of tobacco, alcohol, and marijuana. Our company does have a respiratory surveillance program for our employees who are working in plants processing cotton, and identification of the use of tobacco is obtained from these employees. Our observation of the use of tobacco is higher than that observed in the study just described, and is about 90 per cent. Unfortunately, it has been my personal observation that the percentage is even higher in those employees with chronic lung disease.

Estimates on the total use of alcohol were not attempted; rather, the plant nurse was asked to identify the number of those employees who had become dependent on or had abused the drug to the point that medical treatment or administrative action was required. Roughly two per cent of employees fell into this category, with the nurses estimating that at least twice this number were suspected of abuse of alcohol because of absentee or behavioral problems.

Marijuana is known to be commonly used, but we have no real statistics and feel that legal aspects would make a valid survey difficult. This may have to be attempted in the future in spite of the legal problem because of a possible effect on our respiratory surveillance program. Several of our occupational health nurses have noted significant decreases in lung capacity of young employees who do not have significant cotton dust exposure. Close and repeated questioning by the nurse has elicited a history of heavy marijuana smoking, and it is postulated that this restrictive effect may be the result of fibrosis. It is quite possible that information as to marijuana use will have

to be obtained in an attempt to further define the observation.

I would like to turn the discussion to the second part of the presentation, and that is the signs and symptoms associated with the use of these drugs and an estimation of the hazards they could pose in the workplace. Health and safety implications of drug use are divided into two sections: those which describe short-term effects and which would have implications as far as accident occurrence; and the long-term effects on the general health of the individual which have implications as far as long-term productivity is concerned. With tobacco there really is not much in the way of short-term effects, as the active component would be nicotine which produces stimulation of the central nervous system and the cardiovascular system. Of more concern would be the symptoms produced by nicotine withdrawal, which can be quite stressful to long term addicts with anxiety symptoms and depression.

The more serious long-term effects of tobacco are well documented and are the results of exposure to the cigarette tar. The most serious effect from the point of view of disability is that produced by chronic obstructive pulmonary disease, which is the second most prevalent cause of early retirement in this country. The production of cancer of the lung, the mouth, and the lip have also been identified. The long-term nicotine effects are primarily on the cardiovascular system, with strong association as a factor in the production of high blood pressure, heart attacks, and other complications.

The short-term effect of alcohol has been basically that of sedation, and the symptoms can vary depending on the basic personality make-up of the individual, but commonly, of course, there is some initial euphoria, then drowsiness, proceeding to incoordination and impaired judgment and memory. The long-term effects, with withdrawal symptoms of delirium tremors, the malnutrition because of the substitution of alcohol for food and subsequent cirrhosis, are also well known. Long-term alcohol use also has social implications, with the alcoholic being

involved in murder and suicide situations much more frequently than average, and the implications as far as drinking and driving are legion.

The major effect of marijuana is that of sedation, and here again it appears to me that the effects depend on the personality of the individual, as with alcohol, although there is some indication that euphoria and distortion of time and space is more commonly observed. Experimentally, there has been some evidence that marijuana has an effect on the chromosomes of the cells and thus would potentially be a genetic factor. There is increasing evidence that marijuana smoke is a respiratory irritant and does cause chronic bronchitis and asthma.

As a group, the psychodelic drugs form a number of diverse chemicals whose impact on the personality structure is quite severe. The initial effect is to produce depersonalization, followed by visual and auditory delusions and, depending on the dosage, active hallucinations. In the past, LSD has been one of the more popular; however, other chemicals such as the so called "angel dust" are now being substituted. The well-documented long-term effect of use of these types of drugs is basically due to complications of intravenous use, and these include thrombophlebitis with pulmonary embolus and infarcts. There have been some indications that mental deterioration and personality disassociation are not unusual.

Short term effects of the common stimulants such as amphetamines are actually very similar to those of cocaine. These drugs produce euphoria, hyperactivity, insomnia, and irrational behavior. If used for a long period of time they can result in a paranoid psychosis, which usually resolves on treatment. Like other drugs that are given intravenously, they have the same type of complications, and as these injections are usually given under unsanitary conditions, hepatitis is not an uncommon complication.

The sedatives act very much like alcohol as far as the short-term effects are concerned and, fortunately, one does not see the same devastating long-term picture that is seen with alcohol

except for the withdrawal from barbiturates, which can be quite dangerous and life threatening.

The short-term effects of heroin are mostly sedation, and heroin addicts are notoriously short-lived, with malnutrition and overdose playing a part in their demise. Like other drug users using the intravenous route, they are prone to the complications of unsanitary conditions.

I should like to make some specific comments as far as trying to relate drug usage to accident statistics. The only drug with which it is possible to draw some firm conclusions is alcohol. There is reasonably good evidence that links drunken driving and automobile accidents, and that which links alcoholics with industrial accident rates. The statement by the National Institute of Alcohol Abuse and Alcoholism that alcoholic employees have two to four more accidents on the job and four to six more accidents off the job is well known to all of you. When one attempts to obtain the same type of information for other drugs it is found that the data simply are not available. It would appear that the data involving alcohol comes from law enforcement agencies and from agencies involved with the identification and treatment of alcoholics. It is my feeling that this deficiency could be improved by changes in accident investigation techniques and procedures. A review of the workmen's compensation forms and accident investigation programs shows that few get involved in the human factors area. The investigations usually do not get involved with off-the-job activities, pre-existing medical conditions, prescription and non-prescription drug use, and other factors that could be helpful in identifying all the factors involved in an accident situation.

I can recall in my Air Force days that accident investigations went into great detail in an attempt to elucidate some of these factors, and there is no reason that similar techniques could not be used in industry. Truthfully, however, one can think of several situations in which it would be most difficult to get any valid information as to drug use, and these would be where

fault for causing the accident might be charged to the involved employee as well as the law enforcement aspects of using illegal drugs. In any event, it would be worthwhile to at least attempt to gather some information in this area.

I should now like to turn my attention to the third part of this presentation, and that is what resources are available to cope with the problem of drug use. Since by far the most active involvement with drugs in industry, and in the textile industry also, is with tobacco, alcohol, and marijuana, I will confine my comments to these drugs. In my opinion, the most important drug used in the textile industry from the point of view of compensation potential is that of tobacco. Tobacco is a respiratory irritant and in the long term produces both chronic bronchitis and emphysema that is part of the overall picture of chronic obstructive pulmonary disease. In the textile industry we are also faced with the problem of byssinosis, and this results in the long term also in chronic bronchitis and emphysema. It has been a general experience that tobacco smoking and the inhalation of irritant industrial dust tend to be more than additive and produce much more severe disease than in an exposure to either factor alone. It has been our experience that the finding of disabling byssinosis in an employee who is not a heavy smoker is a rarity. Since it is impossible in the final analysis to separate the disability caused by cigarette smoking and the disability caused by byssinosis, it is my contention that in many compensation cases we are paying for diseases caused by exposure to tobacco smoke rather than exposure to cotton dust. What this means economically is that the textile industry could be paying for disease caused largely by the tobacco industry.

It is of interest to me to note that we do not see the emphasis on antismoking programs that we do on alcoholic treatment programs. Part of this, I think, is due to the common misconception that it is simple to stop smoking, and all that one needs to do is to throw one's cigarette away and the problem is solved. In

actuality this is not a valid approach, as cigarette smoking leads to nicotine addiction, and this addiction requires a supportive program just as all addictions do. As you all know, there are some people who cannot, in spite of all efforts, break this addiction. An example is Dr. Sigmund Freud, who was addicted to nicotine in the form of cigars to the point that they caused an eventual cancer of the mouth from which he eventually succumbed.

At Burlington we have been actively engaged in an anti-smoking campaign among our byssinosis employees since the inception of our byssinosis control program. This involves the encouragement in the use of filtration smoking systems, switching to low tar and low nicotine cigarettes, education material and, most importantly, frequent and emphatic reinforcement by the occupational health nurse. We make it a point to continue the respiratory surveillance on these individuals so that they can be assured of the improvement in the signs and symptoms of their bronchitis when smoking is curtailed.

I should now like to turn to the problem of alcoholism and what is available in the way of resources to attempt to solve this problem. The interest in the detection and solution of this particular drug problem has had tremendous emphasis in the past decade. I have been impressed with a number of brochures that I received as to the availability of treatment facilities; books, journals, and other publications on the many facets relating to the problem, and the support by various government agencies in the way of research and consultation services. I have reviewed a number of the publications as part of the preparation for this presentation, and I think a few words of caution are in order before one comes involved in a program for the identification and treatment of alcoholics. The first is that alcoholism is not a simple condition. You will note that I used the word condition and not disease, because with some individuals who use alcohol to excess there is really not a disease due to drinking being present. This was well recognized by Dr. E. M. Jellinek in his original book

entitled, *The Disease Concept of Alcoholism*. The disease concept was presented as an hypothesis and not a proven fact. This was felt to be necessary because some of the administrative problems of treatment could be more easily accepted using a disease model. Unfortunately, there have been some groups which have used Dr. Jellinek's original hypothesis and have formed very rigid patterns for handling the problems which do not reflect current scientific information. The current thinking on alcohol problems is as follows:

1. Alcohol dependence summarizes a variety of syndromes categorized by drinking patterns followed by adverse physical, psychological, and social consequences.
2. An individual pattern of use of alcohol can be considered as lying on a continuum.
3. Any person who uses alcohol can develop a syndrome of alcohol dependence.
4. Development of alcohol problems follows various patterns and does not necessarily proceed to severe fatal stages.
5. Recovery from alcohol dependence does not necessarily relate to abstinence.
6. The consumption of a small amount of alcohol by an alcoholic does not initiate either physical or psychological need for alcohol.
7. Drinking of large amounts of alcohol over an extended period of time may initiate a process of physical dependence which will be manifested as an alcohol-withdrawal syndrome.
8. The population of persons with alcohol problem is diverse, requiring a variety of services which are tailored to those most effective for that person.
9. Alcohol problems are typically interrelated with other life problems.
10. Emphasis should be placed on dealing with alcohol problems in the environment in which they occur.
11. Treatment should be designed to provide a continuity of care.

Because of the need for services that provide more than just the one which would address the alcohol problem, it is my feeling that those programs which are called employee as-

sistance programs or the broad-brush approach are best suited to alcohol and other drug problems. It would be my recommendation to begin with the various state occupational programs, as they are lower in cost and more convenient for employees to use. All of the 50 states now have occupational program consultants, but the services do vary from state to state, with some offering treatment programs. The majority, however, deal more with problem identification and referral to other resources.

To give some idea about the scope of these state programs, the following are a few statistics that I have compiled on the state programs within North and South Carolina. In North Carolina there are approximately 250 employee assistance programs; 41 of these are in textile companies. During the past year, the problems identified by the program were alcohol-related in 41 per cent of the cases, with 40 per cent being family marital problems and the remaining 19 per cent scattered among a variety of other causes. In South Carolina there are 118 employee assistance programs, of which 90 are involved with various textile companies. They are unable to give me a break down on their type of cases, but did have the interesting statistic that, of the 2,093 referrals made to the organization, eventually approximately 88 per cent of their clients were able to perform satisfactorily on their jobs.

Before beginning an employee assistance program I think it is essential that it include the following ingredients:

1. Written policy statement by top management as to their support of the program.
2. Specific written procedures that everyone understands and follows.
3. A contract with the insurance carrier that insures that both in-patient and out-patient medical and rehabilitation care is available. There are a number of other ingredients that should be contained within the program, and these would be: assurance to the employee of confidentiality of records; training of supervision as to referral procedures; a management orientation to the overall objectives of

the program; employee education as to the benefits of the program; access for dependents both for information and treatment; and a readily available information source.

It is important to note that the only items that have a direct effect on the rate of employee referrals are employee education, dependent access, and an information source, such as a 24-hour

hot-line. While all of the other factors are important as far as the management and the company is concerned, they do not result in referral. One thing to be avoided in a program of this type is a paper program that looks good but is not effective and does not meet its primary objective of providing a service to troubled employees.

MAKE IT HAPPEN FOR SAFETY

By NORMAN L. SELF
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For the purpose of orientation, our plant is located in Pensacola, Florida, on a 2200 acre site bordering the Escambia River, with approximately 420 acres fenced as the plant proper. Our facilities include a large petrochemical plant combined with a textiles operation. Our total employment is close to 5,000 persons.

Where your raw materials may be cotton or, hopefully, synthetic fibres from Monsanto, ours are ammonia, cyclohexane, nitric acid, and natural gas, which make it imperative that proper safeguards and procedures be provided and maintained to avoid such disasters as the all too familiar Flixborough incident.

In this presentation, I will discuss not only basic safety, but what seems to make it work for us. We can talk about interlock systems, deluge protection, management commitment, design reviews, pre-project and process audits, relief valve and rupture disc protection, OSHA, NIOSH, EPA, NFPA, ANSI, MCA, Chem Trek, Factory Mutual, Underwriters Laboratories, AIHA, or whatever—and, yes, we must assure that our operations and processes contain and meet all of these requirements. That is our responsibility as managers and safety people. We may do all of these things and still fail because we have not motivated our people, required enforcement of rules and procedures, or through some other means controlled the behavior or activity of the people doing the work within our operations. I want to discuss how I think we "make it happen for safety" at Monsanto.

At Monsanto, Pensacola, we have been a leader in developing themes stressing personal involvement and individual responsibility, e.g., "Put the 'I' into action," or "I am the one it takes to put the 'I' into action," an

original theme developed by our safety department. "Back to Basics," followed by a sequel, "Build on Basics," is another. Incidentally, Ford came out with an advertising campaign "Back to Basics" the same year we adopted this slogan. Their company complimented ours. We did not copy the slogan from them; however, I often wonder if they didn't get theirs from us as we started using it several months prior to their campaign.

In 1976 we took advantage of the National Bi-Centennial Commission's publicity campaign and adopted the theme "Safety Spirit of '76."

A few years ago we developed a theme, "Be On A Safe Team." Each quarter we changed our board emphasizing safety themes built around the major sports—football, basketball, baseball, and golf.

Since Pensacola is the home of the Navy's famous Blue Angels flight demonstration team, we had them out to our plant to kick off a program with all wage employees. They emphasized the importance of safety in their work and likened it to the team work necessary in an industrial environment.

We have developed many original themes; however, we are always on the lookout for good themes from any source. Last year we used the National Safety Council's "Take the Extra Step" because it suited our needs at the time and much publicity material was available.

All of our original themes are developed at our plant and, fortunately, our plant artist has the talent and resources to prepare posters and other publicity materials. The "Heads Up For Safety" campaign was one from recent years, as was "Measure Up To Safety," utilizing an inch worm, this was one of our more successful programs. During this program the plant

manager had monthly meetings with his staff and each member had to report how his group "measured up" in safety, quality, and cost reduction.

This year our theme is "Make It Happen For Safety." We will further discuss this and how we implemented the program, but first let me tell you a little about our safety organization.

Our safety/fire protection department consists of ten people. In addition, we have a separate industrial hygiene group consisting of four people. Both of these groups work closely with our medical department and analytical labs, which have the capability of analyzing most anything from liquid streams to airborne contaminants. We believe that success requires involvement of everyone from the president of the company to the custodian in the plant. We have that involvement.

We have a managerial safety board consisting of the plant manager and his staff. This board establishes local loss prevention policy and provides positive follow-up on health and safety problems and solutions. Perhaps of more significance, this visibly demonstrates management's desire and commitment to carry out our safety and health policies.

The operating, service, and engineering superintendents hold meetings with their staffs and a member of the safety/fire protection department at least every two months to discuss nothing but safety problems and solutions. For example the yarn manufacturers shift safety committee is just one of the many committees which involve over 176 waggeroll and management members in a systematic approach for handling area and department safety problems. The shift committees in both yarn and chemical areas meet monthly and are involved in all area safety activities, including safety sampling and inspection programs. These organizations provide continuity to the efforts of the managerial safety board and safety committees. Follow-up and positive action is taken on all items brought up by these groups.

This year our safety/fire protection department developed a publicity theme as previously discussed, emphasizing loss prevention, personal in-

volvement, and individual responsibility. Our theme, which appears on the wall of Monsanto's board of directors meeting room, simply states "Make It Happen." Our plant manager kicked off the program in January with the slogan "Make It Happen For Safety." He held meetings with all exempt salaried employees and outlined programs designed to involve all personnel and "Make It Happen For Safety" in 1978. These members of supervision then conducted sessions with all of their subordinates, outlining their responsibilities for the success of the programs.

In conjunction with the kick-off meetings a plant-wide contest was held, with participants listing up to five safety hazards associated with their jobs and corrective action that must be taken to avoid accidents which may result from the hazards listed. Safety shoes, safety cans, smoke detectors, and silver dollars were awarded as prizes.

We have run a series of very successful safety contests throughout the year, all of which have been based on our theme and covered subjects from eye safety to vacation safety. An approach successfully used in several of these contests was the chain letter method. Small cards were used with a safety quiz printed on each card. The receiver of the cards would take the quiz, sign his card, and pass others on to co-workers.

Another means of achieving total involvement and participation is the supervisory personal safety contact program. Each supervisor or foreman must have a one-on-one safety contact with each employee reporting to him at least once annually. A series of topics pertaining to the individual's specific job are listed on the back side of a card, which is kept in his personnel folder. Number of injuries the employee has had and subject discussed at last contact are listed on the front of the card. Both the supervisor's and employee's comments are written on the front side during the contact. Upon transfer to another area, the card goes in his folder and allows the new foreman to know his safety record and which safety topics have been covered

with the employee in the past. The system is very positive in nature, allowing both the supervisor and employee to express their views on loss prevention achievements and/or need for improvement. Each contact is informal and lasts about 30 to 45 minutes. The program has been well received, and some departments are requiring at least two contacts per year.

As you know, industrial hygiene is protection from corrosives, sensitizers, irritants, defatting agents, fumes, mists, dusts, radiation, and noise. It is the protection of employees from those and other harmful agents. In carrying out our policy to monitor employee health and to correct hazards, we have done noise surveys, pulmonary function testing, and environmental sampling. We also provide annual physical examinations and audiometric testing and have maintained medical surveillance since plant start-up in 1954.

In 1975 we made a baseline survey of noise and all known chemicals at the location. We bought 30 personnel monitoring pumps and five noise dosimeters and began compiling data plant-wide. One of our safety engineers was sent to a NIOSH industrial hygiene school for a refresher course to gain knowledge on the latest monitoring techniques and was given the responsibility to coordinate the overall project. In conjunction with this, a noise exposure up-date was prepared.

All of the analytical work with the exception of asbestos and silica dusts was done onsite. Our laboratory personnel have developed 16 standard test methods and validated 26 analytical procedures which are now being used throughout Monsanto Textiles Company.

The next phase of the work was to start a continuous monitoring program. In early 1977 an industrial hygienist was appointed, sent to Kettering Institute Industrial Hygiene School, and assigned the responsibility to coordinate the overall program. Four people now work full time in this area in addition to the full time equivalent of a chemist and three laboratory technicians.

For social as well as economic reasons, it was necessary that we main-

tain systematic programs for industrial hygiene, occupational health, safety, fire prevention, and disaster control. Our plant is isolated from outside help, and we must foresee the need for and train emergency crews such as fire brigades and rescue squads to handle any situation that might arise. Over 200 persons are trained and serve on our ten fire brigades and four rescue squads. These members are trained in fire fighting and rescue techniques at our own fire training ground. Each year we send eight brigadesmen to Texas A & M fire school. This is an excellent means of involving our employees and making them more safety aware.

Good leadership is the key for an effective fire fighting rescue team, and emphasis is placed on the training of our leaders and assistants, and 1978 again proved that we had top quality men. As part of our annual competition each leader developed and pre-planned a problem. After they carried out a drill in the problem area with their brigades, they critiqued it and evaluated themselves. Finally, the leaders made a presentation of the problem and their plan of attack before a group of judges. These judges were selected from members of our top line supervision. The judges graded the leaders on their tactical solutions to the problems and answers to questions.

The highlight of the fire brigade rescue squad year is our recognition banquet, where top management takes time to eat and drink with the men and women who hold our front line fire and rescue defenses. This association and subsequent recognition is invaluable from the standpoint of promoting dedication and loyalty. Capping the evening is the award of door prizes (smoke detectors, fire extinguishers, safety shoes, and safety cans) and the highlight is the presentation of trophies by our plant manager to the brigade and rescue squad leaders having the best competitive drills. Personal service awards are presented, and an innovation that has strengthened the individual's desire to do his best for the company is a personalized picture presented to each member who achieves

15 years service on the brigade or rescue squad.

In order to keep on top of all the inspections and maintenance of our fire protection systems, we initiated an impairment procedure. This procedure has been extremely valuable in precluding the possibility of an oversight in returning any of our fire protection systems or equipment to service. The only people allowed to impair or operate our fire protection equipment are our safety/fire protection and brigade personnel.

A duct-piercing tool for use on air conditioning ducts was developed at our plant for use in conjunction with small hose stations in case of fire inside an air conditioning duct.

Computers are playing an ever increasing role in our production, and fires in these facilities could cause significant business interruption losses. Realizing this loss potential justified the installation of Halon 1301 systems in our spinning area and other computer rooms. We have also provided sprinklers and product-of-combustion detectors in our technical center computer room. We have provided sprinklers inside our spinning machine maintenance areas and the exhaust duct laterals and main air exhaust trunk lines. A special on-off sprinkler (AQUAMATIC) head is an innovative feature which precludes the need for shutting a spinning machine down if a sprinkler head were to operate and need to be replaced. Another innovation is the shrink-wrapping of sprinkler heads inside the FRP duct work in our Cerex plant. This ductwork contains highly corrosive gases, and we tried the standard wax-coated heads; however, the wax would be partially removed during installation and leaks developed. This shrink wrap has proved effective and does not alter the breaking temperature of the head.

Internal repairs required on our floating roof cyclohexane storage tanks developed some unique approaches in making the work safe. Cleaning of scale and sludge was accomplished by filling the tank with water and utilizing contract scuba divers for hydroblasting and vacuuming out the sludge.

A small hose station cover made by our sewing room is constructed of Cerex, a Monsanto non-woven nylon, which was painted by silk screen in our paint shop. These covers serve as an excellent highlight dust cover. Similar covers were also made to highlight and protect our Scott air-paks.

In carrying out our policy of training employees and requiring the use of protective devices and equipment, we developed training system manuals to assist in our chemical operations. These manuals were written by our operators, technicians, and foremen in the operator's language. The format covers operations, emergency procedures, and safety, with specific objectives and feedback provisions. Before completion of the training, each operator must follow flow diagrams and demonstrate by hands-on the operation, function, hazards, and precautions necessary for each piece of equipment within his area.

Loss prevention education begins with our safety/fire protection manual, which is the basis of our safety training, and extends to programmed learning courses in areas such as hot work permit, tag and lockout, vessel entry, etc.

To ensure that proper concern for employee health and safety is present in the execution of contract work performed for Monsanto, a contractor's safety manual is sent out by our purchasing department with every request for quote. The manual contains our general rules and procedures, as well as our emergency procedures.

To ensure that appropriate safety provisions and health consideration are incorporated into the design of all new Monsanto facilities, a loss prevention and environmental control review is held on all projects prior to submitting the appropriation request to the board. These reviews are done by plant, as well as corporate, safety/fire protection, medical, environmental, and industrial hygiene personnel. The reviews are performed on a continuing basis from project definition, to approval, through completion.

I have discussed a few of our programs, themes, and innovations; however, these are by no means all-inclu-

sive. In closing I would like to discuss one of the highlights of each year. Our plant is inspected on a scheduled basis by the plant manager's staff. This team is looking for safety, fire prevention, industrial hygiene, and housekeeping deficiencies and improvements. These inspections are in preparation for an annual three-day inspection by a top management team made up of members from all our textile locations. An all-out effort is put forth and involves all personnel at our location in preparation for the annual inspection and rating.

Do our programs make it happen? We have had an enviable fire loss record of zero for 1977 and zero to date in 1978. This is an outstanding record, considering the quantities of flammable liquids utilized in our process. Our total recordable injury rate to date compares favorably with the latest figures available for the textile industry and the chemical industry. Our programs are geared for involvement. I hope that you have gotten some ideas that may help in your programs.

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