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COPING WITH OSHA (A Panel Discussion) CHAIRMAN'S REPORT

By THOMAS L. KOPKE

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Chairman, ATM Executive Committee

President Nixon signed legislation completing an independent five member regulatory agency to set and promulgate safety standards designed to eliminate unreasonable risk of injury and death from use of household consumer products which kill an estimated 30,000 Americans each year and injure another 20 million. Despite reservations about the bill, Mr. Nixon said it was most important towards recognition that a defective lawn mower or an electric heater can be just as dangerous to the consumer and his family as contaminated food and improperly packaged drugs.

One hundred eighty million dollars has been appropriated and authorized to be spent over the next three years. The presidentially appointed commission will issue mandatory safety standards governing the use, design, labeling, and performance of products not already subject to federal legislation. The commission will be intolerant to recalls, seize and ban hazardous products, and order refunds to the consumer. It seeks stiff fines and prison terms for manufacturers or distributors who locally violate the law. This is another portion of federal legislation, and I don't know whether that could constitute good news or bad news.

I would like to comment on four items that were included in my report to the Industrial Conference on the activities of the ATM Section this past year. Since October, 1971, there has been more than a 25 per cent turn over in the Executive Committee. It is the sincere hope of the General Chairman that the foundation has been laid for a more viable, active Committee.

In the area of publications, we issued and

submitted to the Council for publication one data sheet covering safety committees. We have reviewed and updated one on board notes and are in the process of being ready to submit one on electrostatic spraying. Sixteen Executive Committee members have volunteered to review various chapters in the next revision of the Accident Prevention Manual.

The impact of OSHA is apparent in analysis of the new members that have been assigned to the ATM Section by the National Safety Council. There has been probably close to 700 new members in the last year that have been assigned to our section. In the analysis of this, we find that probably somewhere between 80 and 90 per cent of the new member companies have less than 150 employees. The Executive Committee has directed that the Newsletter, as well as the Congress program this year, be aimed at assisting these new members and other small employers previously included in our membership. The Transactions of this particular session will be mailed to them and they will have the benefit of the panel. I think that the trend will probably continue, and our efforts will continue to assist you as well as the other members of the ATM section in coping with OSHA, and I guess we may even have to give some thoughts to "Is there anything we can do to assist our members in coping with the new Consumer Protection Act?"

The last item is one of our special activities. The Executive Committee through the General Chairman has conducted correspondence with the Assistant Secretary of Labor relative to 54 subparts of the OSHA standards on which the Committee requested in-

terpretation or suggested possible modifications and/or clarifications. The revisions have been received on only seven of these subparts to date, but the Department of Labor indicated that modifications will be forthcoming on four of these that we brought to their attention. The Committee feels that we are adding another voice requesting meaningful change in substandards. Members are working through local associations and through their own companies also to seek this type of change.

You can see we are becoming more and more involved in our work, and we would like to invite you to join us. One year ago, three of the members of the panel made the decision to become involved. They said, "Yes, I would like to serve on the Executive Committee of the Automotive and Machine Shop Sections." I think each of us probably receive far more benefits to our own programs than might be apparent through our contacts, through our business, through our

plant tours, and this extremely interesting work, and it is rewarding.

I would like to introduce you to the Panel Moderator, Clarence Souillard, Manager of Training, Industrial Hygiene, and Safety of the Budd Company, Troy, Michigan.

Moderator Souillard:

It is a pleasure to be here and to welcome all of you to your meeting. This is not Tom's meeting or my meeting, it is your meeting. The meeting will proceed with the panel each presenting a five to ten minute talk on various phases of OSHA. I will introduce them very briefly and in the order of their presentation. We will attempt to field the questions and any discussions as honestly as possible based on facts and experience.

We expect each of you to participate. If you don't, that is your problem. We won't profess to have all the answers, but we certainly will either answer your question from the floor or get an answer.

AN OVERLOOK OF OSHA

By A. A. THANNUM

Mgr., Accident Prevention & Plant Protection Services, Westinghouse
Air Brake Co., Peoria, Ill.

My objective is to give you a quick overlook of OSHA. What is it? What does it attempt to do, and how are we going to try to keep within it?

First, the original purpose of the Act is to assure as far as possible to every working man and woman in the nation safe and healthful working conditions and to reserve our human resources. The General Duty clause establishes the responsibility of every employer to furnish a place of employment free of hazards likely to cause health or physical harm to its employees. It is the right of every employee to expect the place of employment to be free of recognized hazards to his health in all cases.

This law goes beyond most federal laws. It applies to any business affecting inter-state commerce, and as a result of that it affects everyone. The administration and enforcement of the Act are vested primarily in the Secretary of Labor and in a new agency, the Occupational Safety and Health Review Commission, which is a quasi-judicial board of three members appointed by the President. Research and related functions are vested in the Secretary of Health, Education, and Welfare. So, you have three primary groups affecting this legislation. What are some of the chief requirements of the Act?

First, provide specific safety and health standards established by the Secretary of Labor.

Second, to determine compliance with the Act, the Secretary of Labor shall conduct inspections and investigations and issue citations for non-conformance with these standards. In the point of enforcement, there is a number of means by which this is accomplished. First, they provide that citations, if issued, must be prominently posted at or near the point of violation for everyone to see. Second, prompt corrective action to remedy

conditions that are not in conformance with the standards must be accomplished. Third, they can initiate injunctive procedures to close operations in plants where imminent danger conditions exist. And then, of course, it also provides for civil penalties where there is a willful violation.

Another provision of the Act requires that a firm must maintain certain records. This is a bookkeeping area to a great extent and is broken into three primary groups, as I see it. First, those records relating to work injuries or illness: three forms—101, 102, and 103.

The second area you must keep records on is employee exposure to potentially harmful material and agents. Of course, before you know what records to keep and what not to keep, you first have to find out what are the harmful agents.

Third, the type of records you must maintain are those records of self-inspection which are required by the standards to assure that you conform with those standards. These are records of your chain, cranes, ventilation, hearing, etc.

The Act provides that the states will assume responsibility under federal guidelines. You are hearing more and more of this today. The Act also provides economic assistance, primarily to small businesses to help them conform to standards. The Act also establishes the National Institute of Occupational Safety and Health, more commonly known as NIOSH. This group is going to become a greater and greater part of the Act as time goes along because their purpose is to conduct research, develop criteria for occupational safety and health standards, conduct experiments and demonstrations, and conduct plant inspections and investigations to determine if unhealthy conditions exist. These inspections of the place of employment

can be initiated on employee request, employer request, or by the initiation of NIOSH records, very similar to the compliance officers' inspection.

Another area that we only just had a report on was the National Commission on State Workmen's Compensation laws. There wasn't one state in the nation that conformed, so you will probably be getting a lot of pressure to get a standard Workmen's Compensation Act. Now quickly, let's go through the three different parts:

First, it is the general duty to furnish each of the employees a safe place of employment. The employer has a specific duty to comply with the health and safety standards promulgated by the Secretary of Labor. The employer is required to make, keep, and preserve such records regarding his activities related to the Act as prescribed by the regulations. In this group we have the periodic self inspections, records, and reports of work related injuries, deaths, and illnesses, employee

exposure to toxic materials and harmful physical agents. The employer must notify employees of their protection and obligations under the Act. The employer must notify employees of exposure to toxic materials. And last, but not least, we must allow the OSHA compliance officer to enter without delay at reasonable times any place of employment to make a normal inspection of the duties of employees. The Act requires that each employee shall comply with Occupational Safety and Health Standards and all rules, regulations, and orders issued pursuant with the Act which are applicable to his own action or conduct.

So, you can see this is a broad legislation. It is intended to be. As a result of this legislation, we find ourselves in a new ball game, with a revised set of rules and a new referee. If we don't want to be pushed off the field with penalties, we must understand these new rules and then adjust our game plan accordingly.

REVISED RULES

By PAUL KRAMOS

Mgr., Safety Services, Allis Chalmers, Independence, Mo.

In my past 25 years experience in the safety program I have had many governmental inspections of various types. Some of these covered sections of Walsh-Healy; for those who are old timers, you will know that it precedes OSHA. Just recently, three full days of OSHA and not too many days or months later NIOSH moved in and spent a half-day with me. You can rest assured, that I know a little bit about federal regulations, what they expect of you, whether they are the federal government or any type of government.

I can assure you that you have nothing to fear but fear itself. In all of the governmental visits that I have ever experienced, they found many minor violations but few major violations. We have very little difficulty with them because in those instances where we

will make the inspection in your plant, and I make a practice of visiting with these people. I have spent considerable time with the OSHA compliance area office personnel.

More particularly, I am interested in what they mean when certain things are printed in this book? How would they interpret it? It is important to me in my area, because what I read may occur in some other region or area may not apply in that particular area, so it is important to visit particularly with the Area Compliance Officer in your area. Do not invite them to your plants, because if you do, and they find a violation, you have had it. They are required by law to write you up.

Now, let's talk more specifically about federal standards. Most of the federal standards are based on accepted standards developed by recognized standard making organizations. Some of these organizations are the National Fire Protection Association, American National Standards Institute, American Conference of Industrial Hygienists, American Society of Automotive Engineers, and many, many more.

To those of you who feel they are not acceptable, my advice to you is to do this: First, take a good hard look at the standard and see why it is not workable. Second, contact the Chairman of the Standards Committee that is applicable to the standard reviewed and ask for a review. When that committee meets, take time out from work and make a good presentation to this standards committee and sell them on the need for change, for without this change you will have a very slim

chance of getting anything changed in the federal government, because you need something from another type of source like consensus groups to say, "This is the guideline, we feel it is acceptable to you."

Just recently, NIOSH published criteria for recommended standard occupational exposure to noise. We are going to hear a lot about this within the next several years. Maybe even sooner. NIOSH is recommending that the noise level in a plant be reduced from 90 to 85. Now, some of us are having trouble getting it down to 90. They are talking about 85 now and I noticed they are even mentioning 80. Now we have time, but not too much time; the recommended criteria have been submitted to OSHA. OSHA must now study it and make some determination on it. Hopefully, before they make a determination there will be conferences held on changing this standard. Everybody has a right to be heard on whether OSHA should accept this standard and reduce it to 85 or leave it as is. The initiative that we would take will determine whether this criteria recommended by NIOSH will be taken.

Although standards are made and we must live with them, we must make an effort to tell those people who make these standards and let them know our position whether we can live with them or not. Unless we take that initiative, we will be living with a situation as determined by other people—that is something we don't like but this is what has happened in the past.

RECORDS AND REPORTS

By F. ALLEN KINCAID

Supt., Safety & Security, Clark Equipment, Battle Creek, Mich.

The record keeping portion of the Occupational Safety and Health Act became effective on July 1, 1971. If you do not have a copy of these record keeping requirements, I suggest that you get one, and quickly.

The OSHA requires many types of paper work. If you use the paper work correctly, it will be an asset instead of a liability. We will talk a little bit about the different types of paper work and then we will talk about what they can do for you.

You must have the poster prominently displayed in your plant. It may take more than one poster. The poster can be copied, but it must be the same size as the original document. It cannot be allowed to become defaced, damaged, dirty, or unreadable. In the event that it does, you must replace it with a fresh one.

I am sure all of you are aware of OSHA Form 100, which is called the Daily Log, a report on injuries and occupational illnesses. A big question that has always arisen in dealing with the form is what is and is not reportable. At one of the last meetings that I had on this subject in Michigan, the area director said that their understanding of the law was, "any accident or industrial illness where an employee must see a doctor more than once for treatment is a reportable accident. A first aid call where only a bandage or a slight dressing is put on is not a reportable accident, even though the first aid may be performed by a doctor as opposed to a nurse."

Who makes out the forms? Anyone within your organization can do so, but someone should have that duty, and it should be a requirement in writing that that person be responsible for making out the Accident form 100. You must be especially careful that whoever makes that particular record initials it. There may be more than one in your place of business who is responsible for making out the report. If you have a multi-shift operation, you may have someone on each shift

who maintains the log. Be very sure they initial each entry.

Can the log be changed? Yes, it can. It is a running log. It is not set up to be a monthly log. It is a running log and you fill each one completely and then start a new one. Supposing that what was thought to be a lost time case turns out to be a fatality (heaven forbid), you would simply line out the indication of the number of days lost and make a checkmark in the fatality column and initial the checkmark and date it.

OSHA Form 101 is a Supplementary Record of Occupational Injuries and Illnesses. This is what you would call the first investigation of the accident. You can substitute the workmen's compensation form in your particular state if the information contained in the workmen's compensation form is the same as what is on the OSHA form 101, or can be added to it without any great amount of problems. All the information required on the 101 must show on the workmen's compensation form.

Who maintains this report? Again, that can be your decision, but make sure someone has the responsibility. I cannot emphasize enough that you have a good numbering system. The numbering system must be compatible between OSHA form 100 and the OSHA form 101, so if a compliance officer going over the OSHA form 100 says, "I would like to see the 101 on this particular accident," you have no problem in going to your files and pulling it out.

OSHA Form 102 is the Summary of Occupational Injuries and Illness. This can be maintained and made out by anyone within the organization, but it must be made out and posted by 1 February of the month following the year which the summary covers, and it must stay posted in the same prominent place as the original poster for a period of not less than 30 days. Now, again, it may be necessary to have five or ten of these put

around your plant, depending on how many posters it takes so that every employee has a chance to look.

Those are the forms that the OSHA people send you, but there are many other reports that are necessary and I want to just briefly skip through a few of them.

The Industrial Truck Maintenance report is a daily report, if a one shift operation, or a report that is made out before each shift in a multi-shift operation. Basically, it is a check list to make certain the vehicle is in running condition.

The Machinery Maintenance Report deals with repairs and preventive maintenance of all of your machinery and appliances. This is a continuing report and must be maintained.

The Record of Toxic Substances includes employees exposure to them. You must maintain this report, and you must let the employees know how much exposure they have had over the last year.

Safety and Housekeeping Inspecting Records. You are required by OSHA to make a quarterly safety inspection of your facility. It can be often easier than that if you like, but it must be at least once a quarter and you must maintain records. If you make more frequent inspections, it is a good idea to keep records of those also.

Hearing Test Records. If you have areas of noise in your plant which are now above 90 dbA, you must have a hearing noise program, and it must include the testing of hearing of all employees exposed to this noise. You must also have an engineering program to engineer out the noise, and a record of periodic checks of the amount of noise in these areas. These records must be maintained.

Fire Extinguisher Maintenance and Inspection Records. You must have an annual record showing the extinguisher was given an

annual inspection, and it must be by a number so that the compliance officer can walk into your plant and pick out any extinguisher, go back to your records, and find out when was the last time it was annually inspected. You also must have on each extinguisher a tag showing it was at least given a cursory inspection on a monthly basis. These must be maintained.

Manlift Inspection and Maintenance Report. This is a monthly report where you pull a full safety inspection of all manlifts and similar type of equipment in your plant.

Employee Exposure to Radiation Report. This is a report which must be continued on a daily basis, and at least once a year you must, in writing, to each of your employees indicate how much exposure they have had to radiation over the last year.

Hoist, Crane, Sling, and Chain Inspection and Maintenance Records. Depending on the type of lifting device, these are daily, monthly, or annual reports. They must be maintained and should be readily available to the compliance officer.

I have thrown an awful lot of paperwork at you, and I don't expect you to remember all of them. There are others that I haven't even touched on. My only suggestion is study carefully the *Federal Register* and any other records that you can get your hands on. The Compliance Officer's Handbook is another good one. Be careful to check to see just what records are required.

What can they do for you? They can give you a good grasp on what is happening in your plant and perhaps provide a crystal ball to tell you what is going to happen. They can certainly tell you what you need to do to correct some problems in your plant, and they can be a tremendous asset to you as safety people in your business. You have to make these reports out; use them, don't just file them away.

CITATIONS, VARIANCES, AND HEARINGS

By EDWARD A. SMITH
Safety Administrator, J. I. Case Co., Racine, Wis.

The inspection is over, the compliance officer dismisses the hourly and salary representatives, and goes back to the manager's office. He asks the manager if he can have a few moments of his time. In 100 per cent of the cases, the manager finds some time for this nice little compliance officer.

Whom should be at this meeting, at what we call the closing conference? Well, certainly the top manager should be there, or somebody that represents the top manager if he is not available. Also try to have at least, and I say at least, the safety and maintenance people, because basically 95 to 100 per cent of what he finds is going to be the result of the Maintenance Department not doing their job or something along this line. It would probably be a good idea to have the manufacturing manager and perhaps the industrial engineering manager. It all depends on how big you are and who you want there. You can also have hourly representatives if you want them, so it is an open meeting.

The compliance officer discusses what he found at the meeting, what he uncovered, what he thinks is a serious violation, and so on down the line. He will give you an indication at this conference of when he expects you to abate all of the things that he found. When he comes up with these dates, be part of this thing. If he says, "I think you should be able to get this done in two weeks," say, "I am sorry, but we can't possibly get it done in two weeks; give us at least a month or perhaps six weeks." You have to speak your piece, because if you don't, you are going to lose it; and then you are going to get a letter, like we did, saying get it all done in 30 days. Then you have to sit down and write, "Look, we can't get it all done in 30 days." You can save yourself some letter-writing if you have this understood at the closing conference.

If the compliance officer comes across what he thinks is an imminent danger situation, he is going to attempt to shut you down

unless you do something about it pronto. If you disagree that it is an imminent danger situation, he is going to go out to the employees and tell them what he thinks it is. Then he is going to go to the courts to attempt to get you shut down. If the compliance officer himself cannot shut you down on his own volition, he must work through the courts. If it is that serious, I don't think there are going to be too many arguments about whether it is imminent or not and whether you should be doing something about it or not.

Other types of violations that he covers are considered to be serious, not serious, or de minimus; and de minimus is no safety violation at all—not having a coat hanger in the john or something like this.

The closing conference is over, and you rest easy until the mailman delivers the certified letter from the area director. If you are not satisfied with the contents of that letter, what are your options? Not very many people have been satisfied with the contents of the letter. Who, when, where, and how? First of all, who can appeal? Both you, the employer, and the employees can appeal. The employer can appeal to citation, the amount of the penalty, the notice of failure to correct a violation, the allotted abatement time, or any combination. The employee can only contest the length of the abatement period. In other words, if he gives you a month to get something corrected and the employee doesn't like that, if he thinks you can get it done in a week, he has that right to appeal.

When do you appeal? Within 15 days of receipt of the letter, you must write a letter back to the area director. If you fail to do so, you have agreed with what he said and your case is closed. If you appeal, and your plant is unionized, they must get a copy of your appeal. If it is not unionized, you must post it on the board so they can read about it. Where is this appeal sent? Back to the nice little fellow that sent it to you—the area di-

rector. How should you send it? By certified mail so you have it registered. Don't try to save a few cents, because it will cost you more in the end.

Is there a standard appeal form? No, there is no standard appeal form to use. Write the letter, and write it clearly, specifying in there exactly what you want to say, how you want to do it, and when you want to do it, so that there is no chance for any misinterpretation.

What happens to your appeal when it is received by the area director? He must file that letter with the review commission within 20 days after he receives it. He then must write a letter to go along with yours and send it to the three-man review commission. His letter explains precisely what they found, how they found it, and how they interpret that particular part of it. He will then send a copy of that letter to you. Then you have another 15 days to answer that particular letter. Your answer must either deny the complaint or specify in there any misunderstandings that you think you have between the two of you. If it goes to a hearing, all parties concerned will receive a notice more than ten days in advance of when the hearing will be held. A judge will preside at this hearing; the judge is what they used to call the hearing examiner. There are 42 judges in the review commission or reporting to the review commission. The judge after the hearing will issue a written decision to the commission.

The commission has a right to either agree or disagree with the judge's verdict. He is reporting to the three-man commission, and they can rule either one way or the other on it. The commission has the power to review the case and issue their own decision. They might disagree with it and issue a different decision. You will get a copy of this and you will have another 15 days to appeal. Of course, after this you can always go to the United States Circuit Court of appeals, and eventually to the United States Supreme Court, where there are two cases now docketed.

If you change your mind during this appeal process, and a lot of people do, and you decide to withdraw your case, you can do so by doing three things: First, show that viola-

tion has been abated; second, pay the proposed penalties; third, notify your employees. In every case, notify your employees what you are doing or you are going to lose it.

If you decide to appeal, get yourself a lawyer, you have a much better chance. They understand the legal jargon in this bill, and most of us don't. We have our own field of expertise and they have theirs. You want their field of expertise if you are going to go that way.

What are your odds of winning an appeal? Very, very good. According to published figures, if you appeal for an extension of the abatement time, you have about a 99 to one chance that you will get it. For a reduction in the amount of penalty, your chances are about 75 to one that you will get it. So you have a real good average working for you. As a matter of fact, past experience has shown that you have a better than even chance to have the whole thing dropped before it ever gets to the hearing. Use the appeals process if you so desire. Just a word of caution on this field—as they gain experience, naturally your odds are going to drop. Make sure you do it all right and get yourself some legal advice if you are going to go this way. The cats in Washington must be made aware of the irregularities in this law, and there are a number of them. There are a lot of injustices built in. They have to be made known and there is one way we can do it—that is by filing these appeals. If you are bringing these things up, and they realize there is enough of them, there must be something wrong, or they are doing something wrong or industry wouldn't be doing this or the employees wouldn't be fighting this so much.

The other way of doing it is to write a letter to your elected officials letting them know how unhappy you are and what you think is wrong with the law. If you feel that you are being given a one way ride, as so many companies have felt in the past, use the appeals process. That is what it is there for. They have included it in the law and that is what it is there for, so use it by all means. There is a world of difference in area directors and how they interpret the law. The same is true of their bosses. Interpretations vary all over

the place, so we have to keep the appeals process going.

There is one other avenue available to you; this is a variance from the standard. If you feel that your way of doing something is better than or equal to the methods spelled out in the federal standards, you can apply for a variance. There are seven steps which you must follow:

1. The name and address of your company.
2. The address of your employment; it may not be the same because we have multi-plants.
3. Identify clearly the standard from which you seek the variance.
4. Tell them what you are presently doing or intend to do to meet or better the variance you are seeking.
5. Tell how and when do you intend to

comply with the standard. Remember, this is only a temporary variance, so you still have to show them how you are going to do it.

6. Once again, let your employees know that you are asking for this.

7. Describe to the commission how the employees have been informed, and that they are aware they have the right to petition also. Don't be skimpy with this evidence because the decision that they make is based upon what you put in that letter and what is in your appeal.

The best way of applying for variances is through associations or organizations. We have applied for 54 variances out of this group, so if you want variances that is probably the best way to go. One word of caution: if you intend to go this way, don't expect an answer next week. The wheels of justice turn slowly, the variance wheels turn no faster.

MANAGEMENT'S RESPONSIBILITIES

By JAMES H. CAPPS

Safety Consultant, General Electric Co., New York, N. Y.

The major problem of management is making OSHA understandable. We are told that we can get action by our people. I am going to try to make it simple. I know it isn't and you know it isn't; but I also know, and I hope most of you know, it isn't as complicated as a lot of other people would try to make out.

I am going to discuss two aspects of OSHA—the inspection and compliance actions. I assume by now that you all have a reasonable understanding of OSHA and that the mechanics of an inspection are reasonably known. Afterward, will be the time to ask if you have a need for an answer to a specific question. Also should be known to you plant managers, is the attitude of your union with respect to OSHA. Do they play politics with it, local plant politics, or are they trying to use OSHA to handle their grievances? You need to know these things as a part of your bag of tricks as a manager.

When the compliance officer makes the scene, talk with him. You can expect him to be, and I think you will always invariably find him to be, a knowledgeable, dedicated gentleman, but don't spill your guts. Watch how you meet him or who meets him. Don't let him sit in a waiting room; get your plant management out to greet him and get him into the manager's office. In setting up the plant for the inspection, leave the initiative in his hands. Let him tell you what he wants to inspect, what order, etc. If you try to take the initiative, you could easily be misunderstood as trying to steer him away from a sensitive area, and it has happened. Expect the compliance officer to control the union representative. We have had good luck with this. He makes the call to the union headquarters, he determines, perhaps with a little prompting, how many of them join us on the inspection team, and that sort of thing. Controlling the size of the inspection party is a problem, as many of you have found out. Stay with the

compliance officer during the inspection. Listen, take notes; a number of people have asked should I take a tape recorder, a camera and things like that? Don't overdo it. If you have reason to believe that an appeal may be necessary, a record of what exactly the compliance officer saw, when he saw it, etc. would be a good idea. Again, be a gracious host.

Incidentally, with respect to staying with the compliance officer, the union people and employees go overboard sometimes and make statements which you know are not right. Challenge them.

The closing conference is an opportune time to discuss the good safety program that you have in your plant. I don't recommend that you go into long detail about your Compliance Action Program, but you should have a program and, if needed, display parts of it.

Inspections are really quite simple. They can get a little complicated when the compliance officer has a dozen ideas with him and wants to take various kinds of measurements. In any case, don't lose your cool. Of course, you are going to be cited for a few things. It is going to cost you a few bucks, but on the other hand, there is no reason for losing your good humor and your cool.

Now, let's talk about compliance management. You do, of course, need to study the standards. Not all of the 250 pages apply to General Electric, so they are certainly not going to apply to a small plant. Sort them out, earmark those that are important to you, and become acquainted with those. After you have done this, make a quick assessment of where you stand in your shop. I am not suggesting a 40-page inspection report. I am suggesting a reasonably fast walk through by knowledgeable people. For what reason? Well, of course, to tell you where you stand, and to determine the compliance action priorities. As you know, better than I, compli-

ance action is not an instantaneous type of thing. You will need to make, as managers, decisions as to what should be done first. This is what we are talking about. Don't sweat some items. Yes, I know there are 20 pages on ladders or whatever the number of pages is; get yourself a good ladder vendor, buy a good quality ladder, keep it in good repair, and go on to something important.

I assume you have a qualified fire insurance holder who has been advising you over the years about the need for fire extinguishers and that sort of thing. Listen to him. You don't need to go into all the details of all the standards. You will have a number of

vendors who have landed at your plant gate offering an OSHA device that will solve all your problems. I suggest that you use your regular vendors; listen to them, they are your regular vendors because they have represented themselves well in the past. An example is air nozzles. You can buy 99 kinds, but a good many of them do not comply.

In closing, I would like to suggest strongly that you can cope with OSHA. It is not easy, it is probably not inexpensive, but a little study should convince you that a first things first action plan will make it seem a great deal more reasonable.

QUESTIONS AND ANSWERS

Moderator Souliard:

In summary, I would like to make one or two points for emphasis. First, don't be afraid of OSHA. Second, don't be afraid to exercise your management prerogatives. Third, use your organizations, use your business contacts, take steps, even if it means appeals courts, etc., to change standards that are causing you trouble. We have gone through this in the Budd Company. We have had, I guess, a half a dozen inspections in some plants plus a NIOSH hazard evaluation; and out of the inspections we have gone to court on 14 items, the first seven of which we have won, so don't be afraid. If you are right, you are right and take it. For example, one of the ones that we won was so ridiculous—we had one locker room in one of our plants that had 24 electric hand dryers, but we didn't have any paper towels. Well, we were cited because there were no hand towels. Now, it cost us \$500 to go to court, to get an attorney, and straighten out this mess so we could use our electric hand dryers. They have now been approved.

Take the time to correct these things. If you don't, we are all going to be in trouble and suffer. Don't be afraid. Use the tools that are here. In the long run, OSHA will be good. It needs a lot of work and a lot of understanding.

We are ready for the question and answer

the requirements for the quarterly house-keeping inspections?

A: In the *Federal Register* it states that you must make and maintain records on quarterly safety inspections.

Q: I am a consulting engineer with a professional company registered in Michigan. My client is small manufacturers, mainly, I would like to know what your experience has been in the subject matter of laying out plants for the first time and relocating machinery in terms of the degree of agreement or disagreement you have between the regular inspectors, etc., and their interpretation of what is right and what the OSHA compliance man says once he gets in the plant. For the small manufacturer, what kind of experience do they have trying to find the technical facility?

A: First, OSHA is not inclined, as you point out, to accept the results of a local inspector. OSHA does expect these to be wired according to the code. That is also a problem of a good electrician. The inspectors, of course, are not all that great, so they don't really know in a lot of cases and may be very specific on certain aspects of the code. This is one of those areas which I have people ask me how I would proceed. I say, "Pick the course which seems reasonable to you and charge." You can't really get into all that much trouble. This is one of the problems we have with OSHA is fearing fear itself. It makes us spastic and we don't take action. Do a good job, pay your taxes, and run.

You mentioned something about laying out new plants. We have started several new plants and used our electrical engineering group. Where we have used outside consultants, we have stated on all our correspondence it must be wired in accordance with all the various standards as specified under OSHA. If you look in your *Federal Register*, you will find that they refer to a number of electrical standards at the close of that section. We have our electrical engineers go over this and we have not had much problem. We have had one of our plants inspected and have had no problem with wiring. Most consulting engineers should know the answers to that; if not, I feel sorry for them. They don't deserve to practice.

Q: In the advice to the plant managers, you gave ten points: First, have a knowledge of OSHA and second, welcome your compliance officer.

A: Basic knowledge of OSHA assumed, welcome the compliance officer, leave the initiative for the inspection in the hands of the compliance officer.

Q: In record keeping, the OSHA requires that these be kept in a central source, in speaking of the small company, under one roof. Some of these records can only be found like in plant maintenance area, some of them would be in personnel department. It is conceivable if the compliance officer wanted to see all of these, you could spend a good hour or two just trying to collect them all. Will they accept them this way?

A: It is difficult to say. They will accept them in other locations. Agreed, you are going to be wasting a lot of time. In our particular location, a little over two million square foot under roof, our records are kept in diversified locations. We, of course, have not had a federal inspection; but on state inspections, we tell the inspector if he would like to see the records, we will have them collected at a central point at such and such a time. They will accept them in other locations, because you have to maintain them in other locations or you would go out of your mind. I would a lot rather see you do a lot of running around at one time when the federal inspector is there, than to do all the running around daily, weekly, or monthly, or annually, depending on when the record had to be maintained. So, we do not keep them in one certain location. We keep them where they are being worked on on a daily, weekly, monthly, annual basis. Then we collect them all and get them to a central point in the event of inspection.

Q: We have an industry association which has asked for a variance. I have been advised that to properly protect our company on a known violation, we should make a request for a variance. Is this actually necessary, or would a request by the group suffice for this type of a known violation?

A: We have made it a practice at the Budd Company to go on our own as well as registering requests through an organization.

The general contractors have gotten more variations, I think, than anybody as a group. It just seems that if you have a group, you have more power than you have as one single little company asking for a variance.

Q: My question is basically on the state plans that are going to be approved. As large corporate families, what are you going to do? **A:** Cry a lot. I had a very interesting meeting with some people from General Motors who have had the same problem that a lot of us have, and what they are doing is really, I think, a good idea. They have a corporate man who is responsible for OSHA, for interpretation, for disseminating information and this type of thing. Then they are depending upon their local people within their organization in each state to become familiar with the state program. Now in areas where there is not going to be a state program, it behooves all of us to become very familiar with our state programs; and if I can throw a little plug, for goodness sakes, help them—they need it. After all it is the law, and you are going to have to live with it. Get on some committees and work with these people and help them; do so, because it is vitally important to you; but the best bet is to have someone to get very deeply involved in OSHA as the law on a corporate level; and then expect your local plans to work and become familiar with the state programs as they apply to individual states.

A: Budd, we do this very same thing. We communicate on standards interpretations of those units and also have interchange of all state regulations as they come, whether they are applicable or not between the various plants because these states have the habit of copying one another. Jim, do you want to add to that?

Well, one of the things I have to do in the next couple or three weeks, is clear a package for local operations in the states to judge these laws. In every state there is at least one, if not more than one, association of employers that is looking after these state laws. Find out what they are doing, understand it, and think with them and work with them. The problems you get on state laws are that some of them are trying to outdo the federal law on standards and some of these other divisions.

Get active in your area with your organizations, both state and national.

Q: I had heard that New York State was going to go into the business of approving equipment for use in industry. I was wondering if this was true; and if this happens, the eventual problems for all of us.

A: I don't know about New York State; incidentally, that is the plan of OSHA—to get a little bit into equipment.

Q: I would just like a comment on the state plan particularly for those who are in Illinois. In Illinois we have stated that we are accepting OSHA as approved by the federal government and any amendments herein and after enacted by OSHA, and we are reviewing OSHA against the state plan. In those areas in the state plan that are the equivalent to OSHA we are accepting OSHA. Those areas that are more stringent than OSHA we are incorporating and we will have an Illinois OSHA. This is the basis: we are merely combining the present Illinois law and the federal law for the State of Illinois.

A: Let me make just a couple more comments about state plans here. There are two or three things that we need to be aware of. One of them is, who owns the medical data? The unions are trying very hard in some cases to make it so that the company doctors cannot see data taken on the physical condition of the employees. Think about that one if you have not heard of it. The other one is that the review commission separate from the citation portion of the Department of Labor or whoever is doing the state. There are several basic questions like this that you need to look at in addition to what they are doing on standards. It is not simple, it requires a lot of thought and that is why I referred you to these state associations who, I hope, are looking at these aspects of the laws and not just giving carte blanche approval.

Q: We have been having difficulties with our electrical hand tools in determining whether or not they are underwriter approved. Have others had this difficulty, and what are they doing about it?

A: With respect to underwriters approval of hand tools, that is not an OSHA requirement, I don't believe. It will be one day, and that day may not be very far away. I assume

you are talking about tools you have in your shop for awhile, drills, grinders, and this sort of thing?

Q: Even fairly new tools, ones we have bought in the last six months.

A: I have a very simple answer, but it is kind of crude. Go to the guy you bought it from, tell him to get an answer, and make him certify it. That is a service that a supplier should provide. He ought to know. If he doesn't know, apparently, you have the wrong supplier. Carry a statement on your purchase order that says all of your equipment must be OSHA standard. Right now, the only thing they are requiring on tools is that they are three wire grounded or double insulated. UL is not a requirement, but if you include that little sticker on your purchase orders that says it must conform to OSHA, you then at least can hold the supplier reasonably responsible for complying with the law as you and he interpret it.

Q: On these tools that are clearly marked double insulated, you can find no record anywhere where they were approved by Underwriters or anyone else. These tools should be marked.

A: This might well be, but go back to an earlier statement, and it certainly behooves you to force your supplier to certify his tools.

Q: In going around with the OSHA inspector, do you have the opportunity to run down the answers, or are you expected to know everything about your plant?

A: I took the department head with me as he went into each department. Needless to say, a labor member of the entourage made his points. We challenged every point that was made. I would take the initiative of telling what your position is at the moment. You might as well show your good side. As I said before, don't volunteer anything on a point. Answer his questions, but for heaven's sake, don't volunteer. One thing is, don't try to con him. If you don't know the answer, for goodness' sakes, say you don't and tell him you will find out; but don't try to kid, because you are dead if you do.

I would like to add just one more comment as to the competency of the compliance officers. Of the persons I met, the first one had a Masters in ballistics, the industrial hygien-

ist who made the studies in our plant had a Masters in chemical engineering as well as industrial hygiene, the NIOSH people both had Masters, so don't try to con any of them because they will lead you down the path and shoot you out of water.

It has been our experience at Ford Motor Company if an answer is not immediately available, that the compliance officers have given three days, five days, etc., where you can submit the necessary information to your area office. They have been very cooperative in that way.

Q: I understand that there were some inspections of punch press operations in 1974. I haven't seen much written on it and I am concerned in this area. Basically, I am looking for a feel as to how much of that code is really going to be enforced.

A: I don't know, but I can tell you of our program. We have and are still completing a survey of all dies and all presses. We are setting them up with very specific recommendations, we are then assigning priorities for corrective action; and we have gone on record as saying that we are going to correct those things that we can correct the fastest, the cheapest, and will have the greatest impact on our overall press program. That will cover about 80 per cent of our presses where we get into two-button controls, guarding, hand tools. We can machine some additional clearance on our dies, and we do some other odds and ends that are easy to do. On the big dies involving quarter panels, deck lids, hoods, roofs, and this sort of thing, we are going to, quite frankly, just take a calculated risk; they are going to have to wait their time until we get going, because quite obviously you can't do everything at once. It is just impossible. The only thing you can do is demonstrate good faith, show your program, show the progress you are making, where you are, the money you are spending, and when you intend to get to it.

We are to start out with the assumption, of course, that you have done a decent job of guarding them. If you haven't, and you are still losing fingers and parts of hands, etc., you have basic troubles, and the law is not going to stall. I wouldn't rush into an immediate crash program for correction, there

may be something coming up in the next three to six months on that. It is a long term program, so you need to have the plans made. It applies to a lot of companies in different ways.

Q: The federal compliance officers are extremely competent. As the states take over in the compliance area, is the competence of the inspectors going to be a problem?

A: I have found in many states that the state inspectors are equally as competent if not more competent than some of the OSHA inspectors or federal inspectors that we have had. Now it is not true 100 percent, but I don't really see that as a main problem.

In states where they already have a safety program, as in Michigan, we have found this to be very true. Our state inspectors, by and large, are very competent, and I am sure that in most instances we will find that it will be the same wherever the state. You have to realize that getting state participation doesn't mean that the federal government is going to walk off and leave it. They are going to be watching very closely to see the results of the state program, and they have the authority to remove the state participation portion of the program if it is not effective. So, therefore, the state is going to be sure that the people they are sending out are as competent as they can get their hands on.

In those states where there is a lack of expertise, the federal government has set up a school in Chicago, and I know of one state that is substandard as far as expertise is concerned. They are shooting all of their inspectors up here to be trained.

Q: Some of the state plans may be considerably different from the federal. Are any of

you concerned about what is going to happen during this period where the federal is looking over the shoulder of the state, and then what standards are you going to be required to meet?

A: I think that is pretty clear in the law itself. The state law will prevail except where it is less stringent than the federal law; and at that time, the federal law will take over. The only problem we personally have had is a little jealousy in one state on the part of the state inspectors. We get hit with the federal people and before we even blink our eyelids, the state guy would be in wanting to do the same thing. We have a little bit of a problem there, but we managed to cool that off; and I don't anticipate any great problem.

Q: We are concerned about the other side of the picture. Once the state has taken over, and the federals can look over their shoulder for three years, the state plants go to work under the state plan and there may be enough difference that they are having problems. The federal can say, "Well, you are not meeting federal standards."

A: Yes, but the federal government would have to respond directly to the report submitted by the state organization; and then if verification was needed at that time, they would run an inspection for verification. You will find they will pick up most of their information right from the state records and reports.

Q: Is it an OSHA requirement to have the hearing test?

A: I don't know if it is a part of the standard as yet. I hope for it to be included, especially if they drop this to 85.

ELECTRICAL CONTROLS FOR MECHANICAL PRESSES TO MEET OSHA REQUIREMENTS

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With a few minor exceptions, the 1971 OSHA regulations for mechanical presses and the 1971 revision of the ANSI B11.1 Standard are identical. I recommend using the B11.1 booklet rather than the Federal Register, because there are helpful explanatory paragraphs, suggestions, and illustrations in B11.1. Any references I make to the Standard also apply to the Federal requirements.

Section 1910.217(c) of the OSHA Regulations and the corresponding Section 5 of B11.1 state that it shall be the responsibility of the employer to provide and insure the usage of either a point of operation guard or a properly applied and adjusted point of operation device on every operation performed on a mechanical power press, unless the point of operation opening is 1/4" or less.

The word "guard" means only a stationary barrier that prevents entry of the operator's hands or fingers into the point of operation, which is defined as the area of the press where material is actually positioned and work is being performed. A guard is the most positive protection because it physically prevents placing hands in the dies.

In many instances, it's not possible or practical to use guards. Drawing, trimming, and restriking operations on formed parts are examples. In such cases, one or more point of operation devices must be used. In this standard, the word "device" means a control system or mechanism designed to prevent operation of the slide with the operator's hands within the point of operation.

Two-Hand Operation

Two-hand electrical control is the most frequently used form of "device" and protects the operator by requiring the concurrent use of both hands on run bottoms to start

the stroke and to continue the die closing portion of the stroke when single-stroking the press.

The word "concurrent" is defined in the standard as acting in conjunction, and is used to describe a situation wherein two or more controls exist in an operated condition at the same time. It means that the clutch will be actuated after each hand of the operator is holding a button in the operated position. The use of this word is intended to exclude any inference that a simultaneous moment of actuation must exist between the operation of individual buttons. There was a widespread misinterpretation of the word "simultaneous" used in the 1948 revision of B11.1. "Existing at the same time" was the definition intended. In the 1960 revision, this adjective was dropped, but the misinterpretation continued. There can be more disadvantages than advantages in requiring a simultaneous moment of actuation as the timing mechanism(s) required must operate each time the press is stroked and timers do not ordinarily have the life or reliability of straight industrial type relays.

There's been confusion in the past about the terms "two hand trip" and "two hand control device". Two hand trip is now defined to mean a clutch actuating means requiring the concurrent use of both hands of the operator to trip the press. The term "two hand control device" means a two hand trip that further requires concurrent pressure from both hands of the operator during a substantial part of the die closing portion of the stroke. A two hand control device can only be used with a press capable of being stopped during the stroke. Otherwise, there's no "control."

In the 1960 edition of B11.1, two hand

trips on positive (full revolution) clutch presses were considered as operating mechanisms only since the slide cannot be stopped during the stroke. The 1971 revision provides for the use of two hand trip as a point of operation device when installed on a high speed, short stroke press, or when the buttons are mounted at a distance far enough away from the point of operation to insure that the operator cannot inadvertently reach into the point of operation prior to the closing of the dies. In general, presses with a speed exceeding 120 strokes per minute can be safeguarded with two hand trip, as the die closing portion of the stroke would be less than 1/4 second.

Single Stroke Control

The new standard calls for all two hand trip or control systems, on any type of press, to include an antirepeat feature. Antirepeat is defined as the part of the clutch/brake control system designed to limit the press to a single stroke if the run buttons are not released. Antirepeat circuits require the release of all buttons before another stroke can be initiated. This prevents repeat operation with one button tied or wedged down. It is normally provided by proper electrical circuitry connected to the normally closed contacts of the run buttons, one or more contacts in the rotary limit switch, and electromagnet relays. A relatively small number of controls have also been built using solid state components instead of relays for the clutch control.

Two hand trips or controls are also required to have the individual run buttons physically protected against unintentional operation, and arranged by design and construction or separation, or both, to require the use of both hands to start the slide motion. The buttons must be arranged so that other parts of the operator's body cannot readily be used to actuate the buttons. Some installations in the past have easily permitted the use of a hand and elbow of the same arm. The use of run button safety rings is suggested. An operating station used to meet our own corporate safety standards has "hair-pin" protectors made of 1/2" diameter steel rod, as well as rings, and 27" run button centers.

Two hand controls for presses with part

revolution clutches must also have "holding time" during the die closing portion of the stroke when operated in "single stroke." This requires the operator to hold both run buttons until an adjustable point in the stroke is reached where it is safe to release the buttons. There is no fixed number of degrees of crank rotation specified in the Standard, because it will vary with press and die characteristics. Ninety degrees might be entirely safe on a double action press where the blankholder closes early in stroke, but 150° might be unsafe on a slow speed single action press.

For a two hand control to qualify as a point-of-operation safeguarding device, the release of any run button while the dies are still open must quickly stop the slide. The rotary limit switch should have adjustable cams or contacts so the switch can be set to bypass the run buttons at a safe point in the stroke for the particular press. An unnecessarily long holding time can slow up production when manual feeding is used.

Interrupted stroke protection must also be included in all single stroke two hand controls built after August 31, 1971. This requires release of all run buttons before an interrupted stroke can be resumed. Its purpose is to minimize the possibility of inadvertent restarting of the slide after a button has been released during the holding time. This feature is accomplished through proper design of the electrical circuitry.

Interrupted stroke protection is also referred to as "complete antirepeat" or "360° antirepeat." Its prior use was generally limited to certain automotive plants over the last 11 years and it was felt that it would be too great a burden on other press users to require that all existing controls be rebuilt during the next 3 years to include this feature. It was therefore exempted from the modification requirements for existing installations. Any new clutch controls installed on either old or new presses after August, 1971, must have it, however.

Stop Buttons

Part revolution clutch presses must have at least one red color stop button connected so that momentary operation will deactivate the clutch and apply the brake. The button must override all other controls and the cir-

cuit must require repressing of the run buttons, or other operating means, before the clutch can again be engaged. Although not mandatory, a stop button should be available to each press operator. The stop button does not have to be part of the operating station assembly that houses the run buttons. It can also be located on a press column, in the master panel, or in any convenient location.

Stroking Terminology

The terms "Inch" and "Jog" are frequently used interchangeably to describe short or intermittent actuations. In B11.1-1971, the word "Inch" is used to describe only an intermittent actuation of the clutch to produce slide motion on a press with a part revolution stroke or for an indefinite period, depending upon the length of time the operation means is held operated.

The term "Jog" in B11.1 means an intermittent motion imparted to the slide on a full revolution clutch press by momentary operation of the drive motor with the clutch engaged. This must be done with caution because the inertia of the flywheel and crankshaft make it difficult for the motor to accelerate, and starting current of several hundred per cent of normal full load current continues to flow during most of the jog period. Repeated jogging can seriously overheat the motor and burn out the windings, can trip power distribution circuit breakers, blow fuses in the motor starter, and can seriously damage the contacts in the starter, sometimes causing them to weld closed.

In the past, various stroking modes on presses with part revolution clutches have had all kinds of different names and each mode has had various locations on the Stroking Selector switch. To standardize the nomenclature and the rotary positions on the selector, the 1971 code specifies definite terminology and suggests certain selector locations for each mode, arranged so that clockwise rotation provides functions in the order of increased complexity. From left to right, they are "Off," "Inch," "Single Stroke" and "Continuous" (when used). The term "Run" is now defined to mean either Single Stroke or Continuous, the two modes used for production operation.

Operation Selection

The Stroking Selector must include an "Off" position for the clutch control and, if desired there can be more than one "Off" position. There can also be other positions, when required, for proper operation of presses with special features. Selection of hand (run button) or foot switch operation must be by means separate from the Stroking Selector, however. Selection of the stroking mode, hand-foot operation, particular operating stations on multiple operator presses, and crankshaft turnover bar operation must be by means capable of being supervised. Selector switches that can be locked in any position, key operated selectors, or plug-in control assemblies from supervised storage are among the means of accomplishing this.

There have been accidents caused by inadvertent turning of the Stroking Selector to the Continuous position when Single Stroke operation was wanted, or because an operator on a new shift did not know that the controls were set for Continuous operation. When this happens, there is no "Holding Time" during die closure and the press does not stop at the end of the stroke. To try and prevent such accidents in the future, controls on presses with both Single Stroke and Continuous functions must now be arranged so that (1) completion of the Continuous circuit may be supervised, and (2) the initiation of continuous run must require a different prior action or decision by the operator in addition to turning the Stroking Selector before the actuation of the operating means will result in continuous stroking. Three of the possible arrangements are outlined in explanatory paragraphs of the B11.1 Standard.

Inching

In the past, most presses have had a single Inch button, resulting in possible exposure of the other hand to point of operation hazards. The new rules specify that the Inching means must either require the use of both hands or that a single control, if used, must be guarded against accidental actuation and located far enough away so that a worker can't reach into the point of operation while operating the single control. This would be at least six feet. Arrangements with two buttons or with one button and a spring-return selector

switch are being used to meet this requirement.

Run buttons can be used for the Inch function, but I don't recommend such an arrangement unless there is an additional control mechanism to insure that the press is really set up for Inch. Otherwise, the Strok- ing Selector could be turned inadvertently to a Single Stroke, when Inch was intended, and a broken die or crown could result from the holding circuit limit switch contacts by-passing the buttons as the dies start to close and then automatically completing the balance of the stroke with inadequate shut-height.

Multiple Operators

Each operator on a multiple operator press must have a set of run buttons. Clutch control systems for such presses must provide for activating and deactivating the run buttons in each operating station in complete sets. Locking out individual buttons is not permitted. The by-passing of stations not needed for particular operations must be done by a means capable of supervision.

Operating station plug and receptacle arrangements with "dummy plugs" for by-passing, or lockable selector switches are used to meet this requirement. The control system for such presses must also be designed with so-called "dummy plug protection" to prevent actuation of the clutch if all operating stations are by-passed.

Clutch/Brake Valve

The clutch/brake magnetic air valve is the most critical single piece of control equipment on presses with air clutches. Any failure of the valve to shut off line air and quickly exhaust the clutch/brake air can cause a repeat stroke that may result in an injury. For this reason, the regulations specify that the control of air clutch machines must be designed to prevent a significant increase in the normal stopping time due to a failure within the operating valve mechanism, and to inhibit further operation if such failure does occur. The means of accomplishing this is not specified as B11.1 is a performance standard and there is no desire to limit design ingenuity. At the present time, I believe that the best way to comply is to use a self-checking, series-flow double air valve.

In one such valve, each of the 3-way valve

units is raised by a diaphragm to open. Failure of either magnet or pilot, or too slow an exhaust from the operating unit is designed to close the safety unit, shutting off line air and exhausting any trapped air through the safety exhaust port. The press is then inoperative until the fault is corrected and the valve is reset.

In addition to valve component faults, a common problem is the lodging of foreign particles within the valve, blocking a poppet partly open. A chip as thin as a dime can cause a repeat stroke and then can be blown out of the valve the very next time it's operated in an attempt to find the cause of the repeat. These particles can be exhausted into the valve from the clutch or brake, can flake off the inside of a surge tank or pipe, and have even come from unusual places like a broken pressure regulator, a broken clutch assembly bolt, or a broken rotor seal.

If a press has a separate clutch and brake system requiring individual valves connected to a common manifold, both valves should be of the self-checking, double type. Failure of a brake valve is just as dangerous as a faulty clutch valve, and sometimes is even more apt to cause an accident.

The protective valve arrangement is not required on presses intended only for continuous operation with automatic feeding. Since the replacement of all existing non-complying valves on single-stroke air clutch presses would be a tremendous problem for users, this item was also exempted from the three year existing press modification requirements. It is now illegal, however, to replace a single air valve control with another of the same type. Any replacement of an existing valve on a single-stroke press must be made with a self-checking double valve, or an equivalent arrangement.

There's no reference to noise in B11.1 or in OSHA section 1910.217 for mechanical presses. OSHA section 1910.95 does require that noise levels be kept under 90 dBA for 8 hour exposure or else ear protection must be used. It's generally necessary to install mufflers on air valve exhaust ports in order to reduce noise as much as possible. It's important that these be kept clean or they can restrict the exhaust and increase the stopping

time of the slide.

Interlocks

The control for part revolution clutch presses must incorporate an automatic means to prevent initiation or continued activation of the single stroke or continuous functions unless the drive motor is energized and in the forward direction. The simplest way to comply with this requirement is to connect an auxiliary contact on the main drive forward contactor in the single stroke and continuous (when used) control circuit.

The clutch/brake control must be automatically deactivated in event of loss of the electrical power or air pressure for the clutch engaging means, or loss of the counterbalance air supply. Reactivation of the clutch must require restoration of the normal supply and use of the run buttons, or other tripping means. Properly connected air pressure switches satisfy the air supply requirements.

In the control for a press with a Dynamic eddy-current clutch, there must be a suitable electrical interlock between the clutch power supply and the clutch control circuit. Section 3.5.2.11 of B11.1-1971 on Engaging Method Failure was misprinted in the original April, 1971 printing but reads correctly in the corresponding paragraph of the OSHA regulations in the May 29, 1971 Federal Register.

A flywheel brake is not required, but is certainly desirable for bringing the flywheel to a quick stop. When this brake is used, there should be an electrical interlock with the main drive motor starter to prevent application of the brake with the motor energized. The regulations call for the use of safety blocks when dies are being adjusted or repaired in the press. Electrical interlocking is recommended in B11.1 but it is not mandatory. It is required in some states, however. A typical receptacle and shoring plug for the interlock is attached to the die block with a short chain so the plug must be pulled before the block can be used.

Disconnecting Means

Prior to the 1971 edition, B11.1 called for a main disconnect, but it frequently wasn't supplied because the responsibility for furnishing it wasn't stated. The 1971 code specifies that the disconnect shall be provided with every power press control system. It can

be a switch or circuit breaker, lockable in the Off position only, and does not have to be on the press, but should be readily accessible.

Drive Motor Control

The main drive motor starter on all presses must have power and control loss-of-voltage protection and must have the start button protected against accidental operation. A start button with a ferrule flush with the button surface meets this requirement. Magnetic starters connected to momentary contact start-stop buttons provide loss-of-voltage protection to prevent automatic restarting after a power interruption. While not mandatory, I strongly recommend the use of magnetic reversing starters on all machines with part revolution clutches. This provides positive reversing in an emergency without having to get an electrician to reverse the wiring.

On a full revolution clutch press, the only electrical equipment generally required is a disconnect and non-reversing starter with loss-of-voltage protection. The simplest and best way to comply is through a combination starter. Since OSHA has now adopted the 1971 National Electrical Code, all new installations after March 15, 1972 must have overload protection in all 3 lines and overcurrent protection in accordance with NEC regulations.

Control Circuits

The ac control circuits and valve coils on all presses must be powered by not more than a nominal 120 volt supply obtained from a transformer with an isolated secondary, except that motor starters with integral start-stop buttons can use line voltage for the control circuit. There is some confusion over the term "integral." The buttons are integral when they are built into the control and no wires extend outside the control enclosure.

AC voltages above 120 that may be necessary for particular mechanisms must be isolated from any control component handled by the operator. All dc control circuits must be powered by not more than a nominal 240 volt dc supply isolated from any higher voltage.

All clutch/brake control circuits must be protected against the possibility of an accidental ground causing false operation of the press. There are now three recognized meth-

ods of meeting this requirement. They are described in B11.1 explanatory section E3.6.5. A circuit that breaks one side of the line must have the other side grounded and a "Ground Connected" light or the equivalent should warn of an accidental or deliberate disconnection of the transformer ground. Circuits that break both sides of the line must be ungrounded and have two ground detector lights with the common connection completed through ground. All critical contacts of rotary limit switches, relays, and run buttons must be duplicated on each side of the circuit and the buttons must be connected so that each operator has one button on each side of the circuit.

Control System Failures

Clutch/brake control circuits must incorporate features to minimize the possibility of failure within the control system which could cause an unintended stroke of the press. Acceptable methods of controlling normal stopping of the slide include interruption of the clutch/brake valve current directly through the rotary limit switch contacts or through 2 series contacts of two or more independent relays or static circuits.

Rotary limit switches and their associated drives must be designed with reliability as a primary consideration because failures of limit switch contacts to open have caused repeat strokes. These failures can be in the limit switch itself or in the driving mechanism. Cam operated contacts should be of the normally closed type that are forced open by the cams. Chain drives should be kept as short as practicable. All driving components, such as chain, sprockets, gears, couplings, and shafts should be conservatively rated, reliably designed, and securely fastened. Dependence should not be placed on set-screws, because they will loosen. Gear and shaft drives for rotary limit switches, as well as long chain drives, may require a form of limit switch motion detection to protect against broken drives and achieve reliable operation.

In our own plants, we use two separately driven, electrically interlocked cam limit switches arranged so that failure of the drive for either switch will stop the slide at the end of the stroke and prevent further operation until the fault is corrected.

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