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Changing Requirements Under OSHA, with Discussion

CHANGING REQUIREMENTS UNDER OSHA

by

James F. Morgan

As of today, the law concerning concentrations of asbestos in the air in workplaces is that which is stated in the emergency standard which was promulgated by the Department of Labor on December 7, 1971. That publication in the Federal Register was followed soon afterwards, according to the legal requirements, by a statement from the Secretary of Labor proposing to establish a permanent rule. Both of those statements are very similar. In the rule-making procedure, there is opportunity for differences of opinion to be heard and it was in connection with that procedure that the National Institute of Occupational Safety and Health prepared their Criteria Document and proposed a standard different from the emergency standard. Their standard and the emergency standard, although they differ in the numbers, do have a lot in common. They also have some startling differences. The emergency standard states not only the concentrations that are allowable but goes on to discuss methods of compliance and to lay down some rules. The statement of concentrations is rather brief. It simply says, "The eight-hour time-weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 5 fibers/ml greater than 5 microns in length as determined by the membrane filter method at 400-450 X magnification (4 mm objective), phase contrast illumination. Concentrations above 5 fibers/ml but not to exceed 10 fibers/ml may be permitted up to a total of 15 minutes in an hour for up to 5 hours in an eight-hour day." They have followed that

up by issuing, that to the Occupational Safety and Health Administration (OSHA) a sampling data sheet No. 2. This goes into a little more detail about the method of sampling. Of course, this is available from the Occupational Safety and Health Administration.

The NIOSH Criteria Document goes into much greater detail on methods of air sampling and analysis and I would recommend that each of you who has some responsibility with respect to complying with this Act, send for a copy of the NIOSH Criteria Document. It has a lot of valuable information in it. Even if it should turn out that the Secretary of Labor does not accept their proposed standard, it still is a very valuable review of the whole situation with respect to causation of disease and prevention of disease.

The emergency standard, after stating what the allowable concentration shall be and the method that shall be used to determine it, goes on to discuss methods of compliance. Of course, engineering methods come first. It doesn't go into any detail and it does not even attempt to mention all the engineering methods that are available for control of asbestos in the air. Notably it leaves out altogether wetting down your material during handling. This is more or less a simple preface to discussing another means of compliance which is the use of personal protective equipment. In this approach, the proposed rule of the Secretary of Labor seems to be much more liberal in his approach than the NIOSH Criteria Document. The Secretary of Labor simply states, "When the limits of exposure to asbestos dust, described in paragraph a of this section, are exceeded, and engineering controls, required by sub-paragraph 1 of this paragraph are not feasible, or do not reduce the concentration of asbestos dust

235

below the limits prescribed in paragraph a of this section, the employer shall require the use of respiratory protective devices. The selection of respiratory protective devices shall be limited to those specified in paragraph c which follows."

One of the rules published June 7, 1972 permits the use of respirators in lieu of engineering controls for good cause without the necessity of applying for a variance--Ed.

They go on to specify the types of respirators that are acceptable in varying degrees of dustiness. For a situation in which the dustiness slightly exceeds the allowable, a simple filter type dust respirator with negative pressure on the inhalation phase is acceptable provided it is on the approved list of the U.S. Bureau of Mines. I'm sure that in all of our plants the safety office has copies of that Bureau of Mines approved list. It is incorporated by reference in the Du Pont Engineering Standard on Respiratory Protective Equipment. This simple type of filter respirator approved for use in asbestos has a large number of articles listed. I think that there are about 35 approved devices.

When the dustiness goes to a higher level, this rule, and also the NIOSH Criteria Document, requires that a powered filter positive pressure respirator approved by the U.S. Bureau of Mines shall be used. This is a fairly recent development. It consists of a battery-driven or otherwise powered blower taking room air and filtering it usually on a filter carried at the waist of the person who is going to use it and then passing the filtered air to the facepiece of the mask. I inquired about approval

for this type because I haven't seen any listed in the Bureau of Mines list that has come out. I have learned, that to date, there is only one that is approved and it is by a company called Berke on the West Coast. I haven't succeeded in learning whether any of them are locally available but with only one approved device, I would guess that they are in short supply. The Mine Safety Appliances Company has been working on a device and hopes to have approval on one in three or four months.

To determine which type of respirator must be used in situations where the dust cannot be controlled otherwise, a very extensive process of air sampling and analysis is required because these numbers are not easy to come by.

I'll read just this one paragraph in which the powered filter respirator is required. "When the eight-hour time-weighted average concentrations of asbestos dust is projected to exceed 25 fibers (longer than 5 microns) but not to exceed 250 such fibers and when a concentration over a period of 15 minutes exceeds 50 fibers but does not exceed 500 fibers, a powered filter positive pressure respirator is required." I can see a technician for every asbestos worker trying to determine whether he is going to give him the right respirator. I also inquired yesterday about the expected date of publication of the standard. I didn't want to stand up here this morning talking about a proposed rule and find that this morning the Federal Register carried the established rule. The answer I got from OSHA was that it will be coming out in just a few days. They had six months from December 7, 1971 to establish a permanent rule.

This description of types of respirators that are required under certain conditions goes on to state that when respirators are used, a respirator program corresponding with that of the American National Standards Institute Standard Z88.2/1969, shall be put into effect. That Standard is available from the American National Standards Institute, 1430 Broadway, New York, New York 10018. It includes not only the types of respirators for different purposes but also maintenance and care, special problems, evaluation of respirator program effectiveness, methods of cleaning and maintaining respirators, etc. There was an interesting sidelight to the original OSHA regulation concerning asbestos fibers. The ACGIH Threshold Limit Value used to be 5 mppcf counted by an impinger method. In 1968, the ACGIH signified their intention of changing to a 12 fiber/ml count by a membrane filter method and the option was a 2 mppcf count by the impinger method. These numbers derived mainly from a review of the British experience and an effort by Howard Ayer of the Public Health Service to find a correlation between impinger counts and membrane filter counts. I don't think that Howard feels now that such a correlation is really feasible at all but at that time it was given sufficient credence so that ACGIH put it in their intended change. That intended change was again published in 1969. The adopted value was still 5 mppcf. In 1970 the ACGIH had changed their mind. They dropped the 12 fibers to 5 fibers and they eliminated altogether the impinger count method. It was that year when the Department of Labor was suddenly required by the Congress to adopt the rule. They looked into the Walsh-Healy Public Contracts Act which had the only federal standards for air contaminants. The

Walsh-Healy people had simply copied the intended change of 12 fibers/ml. That is what the Department of Labor adopted under the Occupational Safety and Health Act. I have heard one of their people admit that it was a mistake but it did create a lot of furor and a demand for lowering and that is why the emergency standard came out last December.

JFM/neh
7/10/72

DISCUSSION OF PRESENTATION

James F. Morgan

Q. OSHA talks about various exposure levels and exceeding them. How do you propose that we know that we have a particular concentration of 5, 10, 15 or 200 fibers/ml at the time that a person is being exposed?

A. The only possible way that I know of doing it is to take frequent 15-minute samples.

Q. It takes weeks to get our samples back with the results.

A. I appreciate the difficulty that you're up against. But, if you just put a personal sampler on a man and let him carry it through the workday, you won't learn of those excursions for which he would be required to wear the respirator. That is why I say you have to go to frequent 15-minute samples.

Q. One thing in particular, we are now required to take a sample plus two blank samples; this runs into a sizeable amount of money. Are we looking into any possibilities that Haskell will take over the counting so that we can get results without having to wait six weeks and possibly saving a little money also?

A. Let me remark that the recommended method is not a part of the Act. We are not obliged to follow that. Let's wait and see what comes out in the rule. Dr. Zapp might want to comment on whether within the Company we are going to set up facilities to do this counting.

Dr. Zapp It seems to me that it would be only logical and sensible that we do set up facilities within the Company to do this kind of analysis. After all, when you have a need for something, there are usually ways of getting it. Now, we in Haskell do have the equipment for counting;

we have a phase contrast microscope that meets the specifications; and we have one person who is skilled in making the counts. This obviously would not be enough to handle the Company's burden. It might be a start. But our problem is that we cannot anticipate the Company's needs and, so to speak, gear up for them so that we're ready when the requests come in to do the job. We've got to get the pressure from within the Company in order to justify to our own management the necessity for doing the work. In other words, we're a service organization. It will not necessarily follow that these counts will definitely be done at Haskell Laboratory. It might be decided that they be done in the Engineering Department or maybe Central Research. I think, that if you feel you will have a sufficient load of samples so that it is not economically better to send them out to count, you should make this known. Perhaps the best place to make it known or at least a good place to start would be to the Departmental Member of the Company's Liaison Sub-Committee of the Environmental Quality Committee. You know that there is an Environmental Quality Committee chaired by Dr. Edwin A. Gee of the Executive Committee. The remaining members of the Committee are Ernest Ruppe, who is the full-time Manager of Environmental Quality reporting to Dr. Gee and three part-time members namely, Gene Christian of the Engineering Department, Charles Welch the Assistant General Counsel of the Company and George Caldes of the Public Relations Department. They have established a Liaison Committee with the departments. It includes all operating departments and relevant staff departments, but not all of them. The Liaison Committee meets once a month. Up to this point, its function has been primarily concerned with such things as Corps of Engineers permits and problems of that type.

641

However, it does have direct entree to the Environmental Quality Committee which is the closest thing that we are going to get to a corporate form for this type of problem. I think it might be a good place to call the needs to the Company management's attention. So, to answer the specific question, I see no reason why it cannot be arranged for these counts to be made inside the Company, but just who's going to do them is not clear to me.

Q. There are a number of plants with laboratory facilities that have technically trained personnel and have phase contrast microscopes. Is there a reasonable possibility of training local technicians to make these counts and thereby eliminating the time lag involved with sending samples out?

A. If they have the equipment, I see no reason why it can't be done.

Q. Can you train them?

A. Yes, and you can get help from NIOSH. They will gladly help train your people or even check samples with them, which is a good idea at the beginning.

Dr. Zapp I see we have Miss Connie Eddy with us. She's our trained person. Connie would you like to come up and talk about the difficulties and the ease of learning the technique.

Constance W. Eddy I learned how to do the technique and I'm not sure I'm what Dr. Zapp calls an expert, yet. But I went up to the Harvard School of Public Health to learn the technique which is very straightforward. Mr. Morgan put me in touch with Dr. Burgess and Jack Lynch, who actually does the counting. The original reference by Edwards and Lynch, that describes it, came out in 1968 and is almost exactly the way it is still done. I gave Dick Hubiak a slightly updated procedure that was sent to

me by the United States Public Health Service which tells in almost minute detail everything involved. I think the important thing is that this is a very much, a see it and count it method. You have to develop consistency so that the actual technique of preparing the slides and working the microscope is very straightforward. It doesn't require much in the way of technique. What is important is being able to count consistently and with some reliability. Counts between people should compare favorably. So, I think there should be some kind of cross-checking to make sure that whoever is being trained to count, counts the same way that another source will. For instance, Jack Lynch and I, both counted some slides to see how we compared in our counts. We found out that partly because I was new at it and partly because I probably saw things differently from what he did, my counts were slightly higher than his; I think it comes with practice. It's just like counting blood cells. After a while you begin to look at them and see what you're supposed to see and this is why I think some cross-checking should be done. The method is very easy to do and he'd said it was much easier to do than the impinger counts that he used to do before this method. In fact, he likes to do it much better than the impinger counts.

Q. What is the reference you refer to? Is it generally available?

A. The original reference is in the Annals of Occupational Hygiene, Vol. 11, 1968. The other reference I got by writing Jeremiah Lynch at the United States Public Health Service. They have descriptions of everything that you have to know--slides to use, etc. I think this is their manual that they are using to train their people.

- Q. Jim, do you suggest that we get the NIOSH Criteria Document?
- A. Regardless of what the rule is, I think that is is a good document to have.
- Q. You made reference to the fact that if the asbestos dustiness could not be reduced to the recommended level that respirators of some type would have to be used which would require a variance. Under what circumstances is the variance required? Is this a recommendation or is this something that is likely to occur in the final ruling?

- A. In this NIOSH Document their proposed standard states it this way:

"Section 4. Personal Protective Equipment and Clothing, this section shall apply whenever a variance from the standard set in Section 1 is granted under the provisions of the Occupational Safety and Health Act."

That says that if you cannot reduce the level to whatever the standard prescribes that you must seek a variance before you can ever use a respirator.

Reply from floor This means you shut the job down and don't do it until you get a variance.

RJH/neh
7/18/72

Dr. Zapp As you have already heard earlier this morning, under the Occupational Safety and Health Act we are living under an emergency standard established in December and expiring in June. Emergency standards are only good for six months at the end of which time they are to be replaced by a permanent standard. So, between now and June 7, we can expect the permanent standard to be issued. So far the Department of Labor has kept what that will be numerically, a closely guarded secret.

The permanent standard will be more than a number. You've already heard enough of the recommended standard to realize that it not only consists of a speed limit type number or numbers but also a required procedure for surveillance. Surveillance not only of the environment, that is to keep a record of what concentrations you are exposing people to, but also surveillance of the workers, that is to say, medical surveillance. In a way, this is a biological monitoring of the worker. Henry Trochimowicz will discuss this subject.

GENERAL DISCUSSION OF PRESENTED TOPICS

Q. What was the Du Pont standard that listed all of the asbestos-containing cements?

A. Cements SN-500M.

Q. What has Johns-Manville been doing in the area of research? I certainly don't expect them to be going out of the insulation business.

A. Johns-Manville has been very quiet about this. We know they are trying to develop an asbestos-free product but we've heard some adverse results of these materials in shipment. I might mention that all of the asbestos-free calcium silicates we've seen so far by appearance and we can imagine general characteristics are somewhat less than the previous asbestos-bearing calcium silicates. They have lost something. We're going to have to learn to live with it. I don't know other than J-M's Thermo 12 which is a calcium silicate type insulation if they're using a glass fiber binder. They make no prediction other than the end of 1972. In other products, I don't know what they're heading into.

Q. Is Johns-Manville doing anything in the way of research on better engineering controls?

A. In their own shops, I know nothing about. I can only assume they'd have to be, because of the volume of asbestos they handle for many products other than just thermal insulation.

Q. These substitutes, during fabrication or whatever, produce fibrous materials that satisfy the geometry of this regulation. Will they be

ruled out because they are made of a different substance or wouldn't it satisfy the geometry requirements of the length and diameter aspect of the fiber mentioned in the standard?

- A. The standard indicates a fiber greater than 5 microns, it doesn't say anything about the chemistry of the particles. I think the problem is that the asbestos fibers are ideal in that they have this tremendous aspect ratio. It is very difficult to grow any kind of synthetic crystal to come anywhere near it. You can get the diameter but you can't get the tremendous lengths. I think people have gotten some degree of chemical resistance and some degree of diameter but to get this nice combination that asbestos does have, physically and chemically, is pretty hard.
- Q. I was inquiring about the fact concerning monitoring and not why synthetic fibers cannot be found to replace the asbestos fibers. What I'm interested in is, what if you use substitute insulation with non-asbestos fibers? What do you go by in terms of evaluating the air samples? Will these fibers look like asbestos fibers and could you distinguish between the two if they both existed on the plant at the same time in the insulation material? Would the sampling technique now stipulated tell whether you were indeed exceeding a fiber concentration?
- A. This is a point I'd like to make, when we can get totally away from asbestos, which of course, has all the nasty things said about it in OSHA. We're going to have to monitor for diatomaceous earth, glass fiber, mineral fibers, silica and what have you. So there is still going to be a monitoring program but I don't know what the law makers have up their sleeves. When we get away from asbestos, this will take a lot of teeth out of this thing that we're now working on.

Q. I think what you were trying to refer to is as follows: If you were doing fiber counting, can you distinguish these artificial fibers from the asbestos fibers using the criteria of a 3:1 ratio?

A. If you look at asbestos fibers under phase contrast, they will vary in diameter and length. You will recall that the fibers are made of fibrils and therefore each fiber will vary depending on the number of fibrils making up the fiber. There will be differences in length and diameter of each fiber. If they go to these artificially manufactured fibers, more than likely they will be fairly uniform and easily distinguishable from the natural asbestos fibers.

Q. What I was wondering about in the analysis of the samples, would we know by looking at it under the microscope whether we had asbestos or not?

A. Probably one of the criteria that will come out and that I expect is that the insulating material would be labeled that it does contain asbestos.

Q. At the last conference it was indicated that chrysotile could be distinguished by its being comprised of a series of circumscribed circles. Can you tell that through a microscope?

A. By an electron microscope, yes. But you won't be able to pick up these characteristics at the magnifying levels that you count at. You would also have to get a cross-section of the fiber to detect this factor.

Q. Let me rephrase my question. Let's say I had a Johns-Manville product with 10 percent asbestos fiber and 90 percent calcium silicate which I ran samples on and sent them in to be counted. They would report the densities and include the fibers and the calcium silicate. How will they tell if the fibers are asbestos in the mixture?

A. George Lang To the best of my knowledge, there are no other types of fibers in the thermal insulation other than asbestos at this time. It is my feeling that when these people convert, they will convert to only one type of fiber in the insulation.

A. There is another factor when determining fibers and that is refractive index. Slight changes in your refraction mechanism will change the viewing of your particles and I assume that these other materials will have a slightly different refractive index. You might be able to pick it up in this way.

Q. Are we ready to substitute now for asbestos thermal insulation?

A. No sir, unfortunately as I said, it was the smaller outfits who made the greatest gains in the manufacturing of non-asbestos bearing materials. The one outfit I know of is a single production line and if they get a construction type order for a couple of carloads, they're just going to go up in smoke. This is the problem. Our only hope here is that they will lead the big ones and start frightening the big ones about how much business they are losing or are going to lose. The small ones are clamoring in this direction and seem to be a little less encumbered with their investments.

Q. Dr. Zapp This floor tile here may well contain asbestos, pretty well locked in. Is there any hope in exploring new methods in applying asbestos that will permit you to use this material have it so applied that it will be locked in and be no dust problem? Is that being looked at?

A. George Lang I'm sure it is by Johns-Manville but of course you end up cutting floor tile by a number of methods. I don't know what they're doing on this but we have the same problem in a sense in the mastics

we use to finish insulation. I don't know what percentage they contain but they do contain a fair amount of asbestos filler. We have reason to believe we're on the safe side of the coin and manufacture this product which is rather reputable. I have done some asking around and it has apparently gotten a fairly clean bill of health because when you spray this mastic, you don't have individual fibers. It's like spraying tar and the fibers are totally captive and it is very unlikely that you could do anything to that mastic, even after it is cured or dried to free up the fibers. They are trapped.

Dr. Zapp That's what I'm getting at. Perhaps we can still continue to use asbestos if we used different techniques of applying and containing it after it is applied.

- Q. Does the law now read that you shall not spray material containing asbestos?
- A. Yes, I think so.
- Q. Why can't mineral wool be looked at if asbestos is being ruled out due to its toxicity? Why can't mineral wool be adopted by the asbestos processors?
- A. They can. This is the direction that a lot of people will go in but due to the diversity, outdoor nature and geographic locations of most of our plants, mineral wool has very poor abuse resistance. If it gets wet, it pretty well stays wet. It will deteriorate also in cyclic wetting and drying. If we could keep our thermal insulation dry, which would mean no damage and with satisfactory workmanship, our whole problem here is almost eliminated.
- Q. Everybody is putting the "kiss of death" on asbestos, but who will put the "kiss of death" or blessing on a new product that will replace asbestos?

- A. I heard a rumor somewhere that after they get the asbestos under their belt, they're going to start picking on some of the other materials. What these are, I don't know. Let's hope they let us get this one beaten down.
- Q. Is the January 12 issue of the Federal Register the latest on the proposal for the public hearing?
- A. James Morgan That's the latest I know of in the Federal Register.
- Q. The ENA Reporter has something else and it is a little confusing. One aspect of the public hearing included the section on the warning signs. Do you know where that stands? The warning signs that the Commander passed around wouldn't meet the specifications of the January 12 issue of the Federal Register.
- A. The diamond sign was absconded from the National Fire Protection Association. Of course, asbestos has nothing to do with fire. Of the three diamonds, two are zeros and one is 4, for the health hazard.
- Q. What I was concerned about was the one that says "dust hazard" on it. It had to include such words as - "Asbestos dust - may cause asbestosis, a severe lung disease and is implicated with the development of certain cancers. Control of exposure to asbestos dust helps to protect against the hazard." These would have to be on the signs.
- A. It seems like we're better off with the diamond sign.
- Q. What about where to put these signs. We know the insulation shop areas and storage areas are probably some prime areas for placement, but what about the guy in the field that applies the insulation? Do the Commander's signs meet the intent of the law?

A. The placarding of areas in the field or during rip out will be necessary I'm sure and will be a portion of the law. Many investigators who did a thorough industrial hygiene survey found that many individuals who were suffering from asbestos-related diseases were not ladders but only worked in the area around the ladders. So placarding in the areas where they are applying or ripping out asbestos will probably be part of the requirement. Now whether these signs meet the intent of the law, we in the federal government will meet the intent of the law and these are the signs that I intend to use at the present time.

Q. One other question regarding this same promulgated ruling or proposed rule. This has to do with medical examinations. It says that they shall be provided in the way that it has been described. In the case of any employee who is exposed to asbestos dust and to limits specified in the paragraph of this Section (a), a 5 fiber limit. I think it was indicated earlier that 1 fiber/ml would be a point to keep people under medical surveillance. Is there any connotation here?

A. One fiber is the proposed limit in the NIOSH Criteria Document which has been forwarded to the Secretary of Labor for his consideration. Anyone exposed to more than 1 fiber/ml is, by definition, exposed to asbestos and comes under the surveillance program. Presumably if that were adopted, the rules could be changed.

A. There will be a final regulation sometime between now and June 7 and this will be effective in so many days. There is one thing that I think you might keep in mind. We talked about 1 fiber/ml or 5 or 10, these are very small numbers. But in terms of industrial hygiene the ml is a very unusual volume to talk about. We talk about million particles per cubic foot for dust counts and for all the numbers that are listed

in the table of threshold limit values, we have usually two numbers, ppm for volume or mg/m^3 for air. Let's take that 2 fibers/ml. When I put down the number for a cubic meter, it's up to two million. It's a much bigger number and if you figure that a worker is working for eight hours, consumes about or uses 10 m^3 of air; he could be taking in something like 20 million fibers per day. This is the way Selikoff has been stressing it. Two is not a small number--20 million fibers per day is a lot. Let's keep in mind that just by choosing the British designation of fibers per ml, we're making it look smaller than it would be if we were going by the usual American criteria of mg/m^3 .

Q. I was interested in the Commander's comments about exhausting the asbestos fibers from the insulating shops and scattering it about the countryside. I gather that there is not a great deal said about it. Will you comment a little about the disposal of the filtering media that you use for this exhausted air and the disposal of the tons of waste collected by the filters? How do you physically get rid of it?

A. The hardest material to dispose of is the material from the asbestos insulation during rip off rather than the exhaust wastes. Both of these present a disposal problem. We are now requiring large polyethylene bags for harvesting the material, picking it up as you rip it out and placing it in bags just like you'd pick oranges or apples. We also wet down some of the areas to try and cut down on the dust. This is one area where there is nothing, absolutely nothing in the literature about the collection methods for asbestos. We have yet to get our national emission standards. First the standard will come out and then we can engineer for a collection method.

Q. Do you bury it at sea?

A. No, first it goes to a collector who must be warned on what the hazards might be to him. We do this for the launderers also. We recommend sanitary landfill disposal.

Q. There is this recent promulgation of emission limits under the air pollution control act, it calls for bag filters on the exhausts. It is very specific.

A. Yes, it is and its interesting because when you rip out, you don't bring the job to the rip out sight and I've never heard of carrying bag filters to the rip out sight. I'm sure it can be done.

Q. A lot of our plants have shops that already have exhaust systems. Under the present regulation we're supposed to have bag filters on them.

A. You have to see what the national emissions standard is.

Reply They don't list that.

A. In other words, they don't have it.

Reply What they're requiring are the specifics of the handling system which is going to limit the discharge and this will provide controls. For a fixed installation they are requiring a bag filter.

Q. The considerable amount of information that was presented today was intended for informational purposes for engineers and the maintenance people at the plants. Is there a comparable amount of applicable material being sent to the plant physicians so that they are aware and can cooperate with the maintenance people?

A. Well, they should be aware of it and, in fact, we have several plant physicians here today.

Q. Are there seminars given by the Medical Division here in Wilmington especially for physicians?

A. Yes, there was a tri-annual medical meeting of all the Du Pont physicians who could get to Wilmington and a presentation on asbestos was given at that meeting.

Q. One of the problems mentioned here earlier concerns the test proceedings. We collect the asbestos sample and ship it to some unknown place at a fixed cost. You get the results anywhere from two to six weeks later. By this time we have either definitely exposed somebody to severe doses of asbestos or we come out clean--one of the two. Unfortunately, it is too late at that point. The question was raised originally whether or not Du Pont can develop a local system where we can get quicker answers. Is there anybody that is working on a project that is quick and where you can take a sample and run it through a device and get an answer in an hour or two so that you know if you've got a problem?

A. It would seem to me that the OSHA people would like to know the answer to that one. Counting samples with phase contrast microscope is nothing in the way of the quickest method at the best. At the moment there has not been any acceptable alternative developed. I would like to ask Jim Morgan if he would comment on Bethlehem Steel's Central Laboratory. As I understand it, Jim, they have set up a sort of corporate center for industrial hygiene analysis and the samples would be sent in there for analysis. Do you have any idea what their time schedule or turnover rate is?

James Morgan They have a company messenger service that gets samples to the laboratory the next morning. Then it depends on the laboratory schedule.

Dr. Zapp Am I correct in saying that although they have a corporate responsibility for these analyses toward the plants, they have no worry

b 116

now about the impending burden under OSHA?

James Morgan That's correct. Before asbestos, they went through many other things and never increased the number of help. Someone asked this morning about assistance in tooling up for counting at the plant.

Reply Dick Hubiak said the procedure would be included in the package that each of us will get. That is the article that describes the counting technique.

James Morgan The technique will be given to you but I think you should go one step beyond that and arrange with them to count duplicate samples.

Q. Earlier we were given some information about average fiber counts on different operations. Is comparable information available for calcium silicate with 8 or 10 percent asbestos being used?

A. George Lang I'm trying to recall on my memory here, back to a test that Jim Morgan directed for us over at the Test Center. We hoped to test all of the calcium silicate insulations listed in the engineering standards. We hoped to put a hazard label on them and consider the possibility of dropping certain ones from the standards. The interesting thing was the fiber counts did not parallel the percentages of asbestos which ranges from 8 to 15 percent by weight, except for one material, which was 80 percent. Now the 80 percent by weight material was very dramatically different. With the other materials you couldn't draw a line on fiber counts and asbestos-bearing percentage.

Q. If you had a material with only 10 percent asbestos, could you expect only 10 percent of what you determine on a filter to be asbestos?

A. No, even for the same type of operation there are operator variations, wind currents, etc.

Q. I judge then that the minimum that a plant has to do is one, establish a proper method of sampling and an analytical program for asbestos in all their areas that have to do with the handling of asbestos. If, the NIOSH inspector came in, I presume he would first ask for our data from that test program and therefore the minimum that we would have to have is a properly established program for sampling and analytical work.

A. Dr. Zapp The mission of industrial hygiene is to recognize, evaluate and control hazards. Now the recognition of the hazard is that asbestos is being worked with. The evaluation has got to be that point of phase one. Where do you stand? Are you within the limits or are you outside the limits? Of course, control is the important job. If you have an asbestos or a presumptive asbestos exposure, you should have it analyzed.

Q. I guess I have a little problem with that because of the fact that I'm all over the country in connection with asbestos in its many broad applications. I'm wondering if there is some way to get around this thing. If you categorize some of the things that I've seen like sawing and other insulation shop work, could these present hazardous situations and because of that, the operation be automatically barred? Can you then apply only those control measures that are necessary without having to go through a full sampling program on that particular aspect? Can you cut down on the sampling by techniques such as this and only measure when in doubt?

A. Dr. Zapp In your sawing operation, you'll see dust; you know you have a problem of control. So certainly you have to apply control measures. Then you'll have to check on them by analysis to see whether you've brought them down to certain levels.

Q. Like in dismantling, you know you're going to be over the level and you're going to have to wear respirators to have the right protection. So that during dismantling I would presume that sampling will be almost impossible because of the variability in dismantling.

Reply Which respirators are you going to wear?

A. Dr. Zapp There's one problem as I see it here. As I interpret the standard, you are first of all supposed to comply with the limits. So, that the worker, even if he's dismantling, doesn't have to wear respiratory protective equipment. Then, if you claim that it's impossible to meet that level, you request a variance. In which case, you will then be permitted to put protective equipment on your worker. The type of equipment is specified by the level of fibers in the air. So, whether there is a method of short cutting that request for variance, I don't know. Certainly industry is trying to get the Department of Labor to not require a variance each time they put a respirator on him. They recognize the situation as you say. You're tearing out insulation, you know you're going to have a lot of dust. So you outfit him with protective clothing, give him a respirator and that's that. I don't know how it's going to come out.

Q. When you request a variance, are these normally issued so that you can keep varying or is the intent that you are given a little more time to solve the problem by some engineering method?

A. Dr. Zapp If the problem can be solved by existing technology, you are given so much time to solve it. If it can't be solved by existing technology, presumably you keep on the variance until new technology becomes available. For example, at airports you will notice the ground

crew standing outside, when the plane comes in and goes out, are wearing hearing protection. There is no way that you can get the noise level down for a modern four-engine jet at that particular point. If in the future they find a feasible way of doing it, why then they will have to comply and engines will be modified and the ground crews can throw away their hearing protection. That is the key to the whole thing right now. If the existing technology is adequate to solve the problem, you have to use it no matter how much it costs you.

Q. In that context, are there materials available so that we could do away with asbestos?

A. Dr. Zapp Now you come back to substitution. That, as Commander Barboo says, seems to be the easiest way at the time.

Q. I'm not talking about the ease of doing it--I'm talking about the law. Is it defined as technology--the eliminating of asbestos?

A. Dr. Zapp I just say, beware of what the substitutes are going to do.

Q. Do glass wool and mineral wool have relatively clean bills of health when compared to asbestos?

A. Dr. Zapp There is a certain amount of suspicion as to glass fibers of short lengths.

Q. How many years experience has there been with glass fibers--10 to 20?

A. Dr. Zapp Yes, probably, but the kind of glass fibers that we're generally talking about are relatively long, not much of the short type.

Q. When you look at substitutes and consider possible problems later, wouldn't now be the time to develop some methods to tag the problem and make them identifiable?

A. Yes, we're trying to do that. We are currently running tests on some fibers that are not asbestos. Our first approach is to do intratracheal insufflation tests which will give you an answer in sixty days as to whether or not the dust produces fibrosis in the lungs. It doesn't answer the question of carcinogenicity. It takes much longer to develop answers for that. For example, we had a fibrous mineral dust that contained no silica. It looked like a natural. But when we did the intratracheal insufflation test, it did produce fibrosis. Now we're going beyond that test. We're testing over a two-year period to see whether we get fibrosis that is recessive and whether there is any possibility of carcinogenicity. So, you can get a quick answer to tell you that a certain candidate fiber can or cannot cause fibrosis by the insufflation test. It's very helpful to know if it has the potential for causing fibrosis.

Q. In the Commander's discussion of the medical facts supporting the hazardous nature of asbestos, he indicated that the levels have been established upon what appears to be rather scanty information. It seems that once these laws are promulgated, as of June 7, it is likely that they will be challenged almost immediately. Maybe the level of 1 or 2 or 5 or whatever is still going to be open to speculation as to what is fair and proper.

A. Dr. Zapp Yes, I think again the unfortunate thing that the data necessary for establishing another number is no better than the data used to establish the proposed 2 or 5 or 10. Usually in the case like that, the courts will not decide against the government agency.

Q. The regulation states that you have to have exhaust facilities for hand tools. Now we have a lot of operations out in the plant. I was wondering if anyone had ideas or recommendations for providing exhaust facilities

for saws which are used for insulation?

A. In the shop it is no problem, you can use downdraft exhaust. The ACGIH and some other groups have been touting high velocity-low volume exhausts. You can exhaust something with 12" of mercury vacuum and use very small volume. For example, Hobart came out with a welding torch which is able to use 20 cfm to do the work of what has been common in the trade of 400 cfm. It actually controls dust much better. I think you are going to see more applications of this.

Q. I'd like to talk about respirators for a minute. It seems to me as though you have to put a respirator on an individual until you can prove that you don't have 5 fibers/ml. You have to have a respirator on the man doing the work before you can take the samples. After you take the sample and you find that it is more than that level, you realize that the man has not been wearing the proper respirator. Now in looking at the slides that the Commander had, it looked like most of the operations were well over 5 fibers/ml. I noticed that they were wearing Dustfoe® respirators. In most cases it was over 10 fibers/ml and which calls for positive displacement type respirators of which the Dustfoe® is not. They haven't mentioned anywhere whether you can use respirators that use high efficiency filters. Wouldn't they be a better respirator or is the problem that the filters will plug up rapidly and thus require positive displacement respirators?

A. Commander Barboo First of all, your counts were made on a time-weighted average. The approach in your counting procedure of obtaining a good TWA is to use a long sampling period. In the incremental steps in the

requirement from 5 to 10, 10 to 100, and values greater than 100, whatever they may be, the Secretary of Labor says you must find precisely the type and schedule of the test for the respirator that must be used. They are U.S. Bureau of Mines approved in the Federal Register announcements. That is not to say that you cannot investigate the use of other respirators. The use of the respirator to the industrial hygienist is an admission of defeat, engineering-wise. So, that once you require a respirator, you are saying that you cannot engineer out the problem.

- Q. Is the interpretation correct here that in demolition operations that the forced air respirator is required?
- A. Dr. Zapp I would think the way these stripping operations are carried out, it would certainly come under that category of exposure which would require forced air.

Reply It says in the regulation that regardless of what the concentration is, you must use forced air or fresh air.

Commander Barboo It is to your advantage, because positive pressure does have some air coming around the fit which means nothing can get in. It also does help the bewhiskered individual and it does help in air conditioning the face. It does have a number of advantages.

- Q. Wouldn't it be rather difficult to wear this type of respirator around pipes and in close spaces?

A. Commander Barboo Yes, that is why there should be good use for a power pack respirator in these areas. The hose from the battery to the face-piece would be close to the body and would not get entangled like the fresh-air line hose.

Q. I think one problem, we in Textile Fibers have to get some clarification on , is the difference between removing of usable insulation and just demolishing insulation. There is not the degree of dust generated during removal as there is in demolishing. There is a difference to an engineer. It is removal so that it maintains its integrity, not only because the dust is held down but the ability to reuse the material. It is constructed so that the exposed surface is pretty well cemented. We don't feel that there is a problem with this operation. Where we have to dismantle equipment on a two or three year basis, we are concerned with the discussion covered today regarding dust generation. Therefore, regarding the requirement, do removal and demolition refer to the same thing? For example, cutting a small section off with a knife, I would term removal because there may be the intent of putting it back on. Demolition changes the integrity of the insulation which differs radically from removal.

A. I think you should see the operation before you pass judgment on it. I don't see where you can get around creating a mess during any kind of removal operation.

Reply I think the uncontrolled dust is the picture the Department of Labor had in mind when they set that requirement.

Q. We have so many plants involved and it seems that to get a uniform administration of the policy could be rather difficult. Can we get the Standards Committee to modify the regulation so that we can get some semblance of the uniformity needed?

A. Dr. Zapp We have to wait for the final form to come out. Legal will definitely be taking a look at it.

Reply There is an engineering standard coming out by the Standards Committee to cover the topic of asbestos along the lines of the emergency standard. Perhaps changes in it will be necessary when the final law is established.

- Q. There is a question I have regarding a point in this proposed S4T standard. It says food, gum and tobacco cannot be stored or consumed in an insulating area.
- A. Dr. Zapp The chance for oral ingestion of asbestos is dangerous to your health. Cancer in the gastrointestinal tract is elevated in asbestos insulation workers. It is not as elevated as much as lung cancer, but it is above the baseline of the general population.
- Q. Would you say this would prohibit a person from smoking in an area like this?
- A. Dr. Zapp I can't see as much a rationale for that as I can for eating. Because whatever you're smoking, you have a fairly efficient filter.
- Q. Should we convey the information from this seminar to the plant physician and make him aware of taking a closer examination of the asbestos workers?
- A. Yes.
- Q. I have a question about sampling for 10 minutes. We have no problem about our people taking an eight-hour average on a number of employees to see what that turns out to be. They are very capable in this. But they are reluctant, however, to take 10- to 15-minute samples on every piece of equipment in the shop to obtain a number of samples and record the data. Do you think we should be doing this?
- A. If your eight-hour samples are within the specified limits, this is fine. You might still be questioned, if the inspector sees an involuntary emission of some sort. He might ask as to what you are doing on a 15-minute sampling basis.
- B 125

Q. When you have an insulator and a general class of mechanics who may spend one day, no days or even up to two or three weeks insulating, it would be hard to get records to find out how long they spent doing this. Now in this time-weighted average, do you assume the worst in a case like that? When you know they're not going to be above the insulator's time and values, are they held to the same peaks and averages as an insulator with the same exposure, taking into consideration that his exposure is for only one-twelfth of the year?

A. I don't know. We'll have to leave it up to the lawyers. You're not permitted excursions above 10 fibers/ml. So, in that case, you could use single service respirators for those short-term exposure conditions.

Dr. Zapp I don't know if you'd have to apply for a variance or not.

There is another criteria that comes in and which is that the 5 fibers/ml standard was based on a work expectancy of 30 years of exposure. You multiply your 5 fibers/ml times 30 and come up with 150 fiber years or exposure years--this would be an accumulated exposure. The British figure that if the exposure years factor were 100 that you would have little chance of getting asbestosis. The present emergency standard is above the 100 exposure years. If you went to 2 fibers/ml for 30 years, you would have 60 fiber years, which is way below the 100 criteria which makes it on the safe side. You could make some kind of calculation like that in terms of your occasional worker. If he works 30 years but only one month of the year around asbestos, you'll be well within the safety factor of 100. This would be a good argument for the application for variance.

- Q. You still would have to wear masks during those peaks, wouldn't you?
- A. Yes, the difficulty is that nobody knows what a safe level of exposure is especially concerning peaks.

RJH/neh
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