UNITED STATES DEPARTMENT OF LABOR

WASHINGTON, D.C.

In the Matter of:	
STANDARD FOR EXPOSURE TO ASBESTOS DUST, PROPOSED RULE MAKING	PUBLIC HEARING

Conference Room B
Interdepartmental Auditorium
12th & Constitution Ave., N.W.
Washington, D.C.
Thursday, March 16, 1972

The above-entitled matter came on for further hearing, pursuant to recess, at 9:00 o'clock, a.m., Thursday, March 16, 1972.

BEFORE:

ARTHUR M. GOLDBERG, Hearing Examiner

APPEARNCES:

(As heretofore noted.)

M-310

CRMC-Motley1000-Subj-001458

Are there any questions of Mr. Nobel? You are excused, sir.

MR. PUNDSACK: Dr. George W. Wright will be our next testifier.

STATEMENT OF MR. GEORGE W. WRIGHT, M. D., HEAD OF THE DIVISION OF MEDICAL RESEARCH, DEPARTMENT OF MEDICINE, ST. LUKE'S HOSPITAL, CLEVELAND, OHIO

DR. WRIGHT: Mr.Goldburg, my name is George W. Wright. I am the Head of Medical Research in the Department of Medicine, of St. Luke's Hospital, Cleveland, Ohio.

In 1932 I received the MD degree from Indiana University School of Medicine. After five years of Post Graduate Training in Internal Medicine, with special training in pulmonary disease I spent two additional years in research training in the Department of Physiology at Case-Western Reserve University.

From 1939 to 1953 I was a member of the Saranac Laboratories of the Trudeau Foundation engaged in studies of the pneumoconiosis, including asbestosis. Since 1953, I've continued this general field of study in my current position.

My statement will be confined to consideration of a single primary question. This question is: What is the quantity or concentration of asbestos, in the air breathed by those engaged in the production, manufacture, or use of asbestos products, which can be tolerated for a normally expected work life without risk that such exposure will cause disease?

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The answer to this question goes to the heart of these hearings. While the question is rather easy to formulate it is difficult though not impossible to answer.

The obligatory information required for developing an answer to the primary question on an acceptable scientific basis is of two categories. One of these essential categories concerns the dose or quantity of asbestos inhaled and the other essential category concerns the biological response. What we need to learn is the dose-risk relationship.

The dose is estimated in terms of concentration of respirable asbestos in the air multiplied by the duration of the exposure. It is obligatory that we establish a dose, in measurable terms, at which the biological manifestations of disease occurs and then, by observing populations exposed to progressively smaller and smaller doses, determine the level at which the biological reaction to asbestos no longer occurs.

To make observations with regard to the various dose levels of different working populations without knowledge of the biological response of these same populations is of no use in answering the primary question. To make observations of the biological response in various working populations without valid knowledge of the different levels of asbestos exposure experienced by these same populations is equally of no use for finding an answer to the primary question.

Standards for a safe level of asbestos exposure

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proposed or set in the absence of reliable and valid data in both of these two categories must be considered empirical and to some degree arbitrary and should be recognized as such.

I wish to indicate some of the difficulties encountered in efforts to obtain the information essential for determining what the safe level of asbestos in the occupational environment truly is.

Asbestos is a generic term embracing four varieties that are in common commercial use. Of these, chrysotile is used in largest quantities followed by crocidolite, amosite and anthophylite. Each of these has different chemical and physical attributes. Some working populations are exposed to only one variety of asbestos while others are exposed to two or more simultaneously and in varying proportions.

Thus there are several kinds of populations each exposed in quite different ways to one or more kinds of asbes each of which might react biologically in a different manner. Moreover, workers exposed to asbestos are further exposed simultaneously to other airborne agents.

In production, manufacturing, and utilization processes these may differ greatly. For example, the asbestos producer is exposed to asbestos with minimal coexisting agents while, in contrast, the insulation manufacturer inhales asbestos plus silica plus other pneumoconiosis producing dusts.

Insulation applicators inhale these materials plus

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a variety of additional agents present in whatever the environment is in the place where he is working at that time.

Attention to such coexisting agents has been ignored in most studies, especially those of insulation workers. Variations of type of fiber and the circumstances surrounding their use must be taken into account in answering the primary question and would suggest the possibility that different standards might be rational in order to meet different conditions of use of asbestos.

There are four totally different biological phenomena or diseases thought to be related in some way to the inhalation of asbestos fiber. These are pulmonary fibrosis, bronchogenic cancer, thickening of the pleura, and mesothelioma. Not a single one of these diseases is peculiarly related to or caused solely by the inhalation of asbestos fiber.

Each of the four diseases occurs de novo or for other reasons in persons who have never been exposed occupationally to asbestos. The fact is, the biological reaction attributable to asbestos is not a specific kind of disease induced solely by asbestos.

Instead, the biological reaction to asbestos manifests itself by the fact that in some populations occupationally exposed to asbestos, there is, in contrast to non-exposed populations, an excess occurrence of one or more of the four previously mentioned diseases.

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To determine the safe level for the use of asbestos, we are required to demonstrate the level of exposure to asbestos at which no excess of disease develops when the exposed population is compared to a non-exposed population. In order to establish a safe level we must examine suitable control populations not exposed to asbestos, but age matched and residence matched, in which population one can learn the frequency of occurrence of the scentific specific diseases in question.

In addition, we must examine an exposed population, which can be ranked in various levels of exposure, in order to learn at what level an excess of these diseases occur in the exposed population. The observation of a biological abnormality in only one or two persons who have been exposed to the inhalation of asbestos fibers does not permit a comparison for suitable groups, control groups, or afford contrasting exposure values.

Such observations are of no use for determining a safe level standard. Isolated case reports of mesothelioma, bronchogenic cancer, or pulmonary fibrosis in individuals who may also have had an exposure to the inhalation of asbestos fibers are of no use in setting a safe standard for asbestos based upon sound scentific principles.

Larger populations in which only the frequency of occurrence of disease is reported without the necessary data indicating ranges of exposure and in which no attempt to relate variations of exposure to disease is made, fall into the same

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non-usable category of setting a valid safe level.

That is not to say that observations in such groups are of no value for other purposes, but the issue should not be confused by introducing data from such inadequate studies into considerations of safe levels of asbestos exposure. Suitable control populations made up of individuals in sufficient number who were never exposed to the occupational inhalation of asbestos fiber and occupational groups where exposures are demonstrated to have wide variation are difficult to obtain but absolutely essential for our purpose.

The absence of this kind of control data, excused or overlooked on the basis that it cannot be obtained, is an unacceptable condition if the safe level standard is alleged to be set on the basis of universally accepted scientific principles.

There is difficulty also with asserting the frequency of occurrence of the diseases thought to be related under some circumstances to the inhalation of asbestos fiber. There is disagreement as to the criteria for a valid diagnosis of "asbestosis", especially in its least severe manifestation, are not generally agreed upon.

The use of the chest x-ray for diagnosing the early manifestation of asbestosis is a case in point. A recent report by Murphy and his co-workers of a study of employees in a shipyard demonstrated that twenty percent of the control, or non-exposed population gave evidence of x-ray abnormalities which, if observed in the exposed population in the absence of controls, in

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all probability would have been interpreted as being evidence of the effect of the inhalation of asbestos fibers. In a population which has been exposed to asbestos inhalation, it is very tempting to ascribe any departure from a perfect appearance in the chest roentgenogram to the occupational exposure, and indeed, in some studies this has been done.

It is imperative to even recognize that some persons who have never had an occupational exposure to asbestos will show the same x-ray shadows that have been interpreted by some as evidence of asbestosis in populations exposed to the inhalations of asbestos fiber.

Studies such as those by Murphy exemplify the necessity bearing on the determination of a safe standard for asbestos.

There are still other difficulties having to do with establishing the dose risk relationship. The health effects of asbestos inhalation are both dose and lapse-time related.

Over evidences of asbestosis do not appear until years after the initiation of the exposure. The interval between onset of exposure and its effect is even greater for the development of bronchogenic cancer or mesothelioma. This interval ranges between twenty and forty years.

Because of the long time lapse between the initiation of exposure and the manifestation of injury, the incidence of disease occurring in populations now under study is the result of, and must be related to, exposures which took place twenty to forty years or more ago.

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To relate exposure measured only now in the past five or so years to the current frequency of development of disease which actually was induced by exposure occurring years earlier, is a serious error. During the past twenty-five or thirty years there have been many technological changes in the production, manufacture and use of asbestos containing material.

In many situations there is much less asbestos now being incorporated in the material than was true twenty or more years ago. In addition, there has been a progressive dust control effort to reduce the concentration of airborne asbestos in mines, mills and manufacturing establishments in a deliberate attempt to reduce and abolish asbestos related disease.

So much has been accomplished in this direction by technological change and systematic asbestos control efforts, that contemporary measurements of occupational environments cannot be accepted as representative of conditions twenty to forty years ago.

To summarize this part of my statement I strongly urge that when data offered in support of setting a safe level stand... is being judged, one should ask the following questions:

1. What again were the different kinds and proportions of asbestos used and what were the coexisting agents to which workers were exposed in the different occupations?

2. What were the specific criteria and methods used and were they adequate for making a diagnosis

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of the biological reaction attributed to the inhalation of asbestos?

3. Were suitable controls in the sense of non-exposed populations and exposed populations whose exposure varied in the intensity and duration utilized?

4. Was the exposure actually responsible for the disease properly determined or were contemporary dust estimates inappropriately applied to disease which was in fact the result of exposure years ago?

The demands inherent in these questions pose formidable obstacles to arriving at a scientifically valid single number which will indicate the concentration of occupational airborne asbestos that can be tolerated with safety for the customary duration of employment.

In spite of this, as I will show later, there are substantial data which will satisfy the requirements posed by these questions and which again can be used for the purpose of determining at least a first approximation to the safe level of occupational exposure to airborne asbestos.

We must now examine the various established and proposed standards for a safe level of asbestos in the occupational environment, in the light of the just discussed requirements as to data needed for setting a standard on a sound scientific basis.

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Systematic efforts to reduce here the amount of asbestos in the air of working places by governmental directive was made in the factories of Great Britain beginning in 1931. No numerical standard for this purpose was set, but Statutory Rules and Orders were promulgated. Later, on the basis of limited data relating impinger dust counts to x-ray abnormalities in several asbestos textile factories of the USA, Sayers and Dreesen suggested a numerical standard of five million particles per cubic foot as a tentative safe level.

This was the limit adopted by the American Congress of Governmental Industries Hygienists in 1946. Utilizing the conversion data for textile mills published by Lynch and Ayers of the U. S. Public Health Service 5 million parts per cubic foot is the equivalent of approximately thirty fibers/cc.

In 1960 the British Occupational Hygiene Society suggested numerical guides aimed at reducing the risk of developing asbestosis.

The suggested guides indicate that those concentrations, averaged over a three month period below 2 fiber/cc ought to be considered low, and that over the course of 50 years of employment, 100 fiber years is the level below which there would be less than 1 percent change of developing asbestosis as defined chiefly by the presence of rales.

If asbestosis is defined by x-ray abnormality, the level becomes 132 fiber years. In 1968 the ACGIH changed its recommended standard to a time weighted average of 2 million

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particles per cubic foot or twelve fibers/cc. In 1970 this Committee decided to change the standard to 5 fibers/cc which is equivalent to less than 1 million particles per cubic foot.

Several months ago OSHA set an emergency standard of 5 fibers/cc, and within the past few days NIOSH now proposes a standard of 2 fibers/cc.

What is the scientific basis of these various standards? The standard proposed by Sayers and Dreeson did attempt to relate dose of dust containing asbestos, as measured by the midget impinger to the risk of developing pulmonary abnormalities in terms of abnormal x-ray patterns.

Their study showed a higher frequency of abnormal x-ray patterns in those most heavily exposed as contrasted to those less exposed. They found no excess of abnormal chest x-ray patterns than in those workers exposed to less than 5 million particles per cubic foot. Hence their suggested standard of 5 million particles per cubic foot. We now know, however, that the population studied was not observed long enough for the full range of disease to develop.

The authors appreciated this possibility and proposed the standard as being a tentative one. In retrospect we know that the standard, although it led to marked lessening of the dustiness in some occupations, was not adequately based and the passage of time has demonstrated it to be an inadequate standard.

The numbers proposed by the British Occupational

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Hygiene Society are based on a study of 233 male employees from a single asbestos textile mill.

Their employment began after 1933, all had worked for at least ten years, and the exposure period extended from 1933 until 1966. The indicator of disease was basal rales and x-ray changes. No measurements of dustiness in this bill were available prior to 1950.

Membrane filter fiber content counts done in the modern manner were used only in the last year of the study and these served as the factor for converting previous counts using other methods to an expression in terms of fibers. To obtain an index of exposure for the period between 1933 and 1950 - a crucial period of exposure - the first measurements made in 1950 were raised by 40 percent.

No evidence was given for using this very slight augmentation. Studies in other textile factories such as those by Sayers and Dreesen indicated that when ventilation controls were first applied in their textile mills the dust counts dropped 1,000 percent or more.

One would assume that the same happened in this British textile mill. The seventeen years of exposure during that most crucial period between 1933 and 1950 would appear to have been substantially underestimated.

This study, in spite of its less than adequate scientific base is important because it was the first attempt

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after 1938 to set numerical guidelines for the prevention of asbestosis. The number of persons in the study is very small; the criteria for disease, especially basal rales, not universally accepted; and the estimate of dustiness seriously lacking in rigor. The estimate of dustiness was on the low side for the reasons that I have already mentioned and, in addition, because no attempt was made to further adjust for the longer working hours and hence of exposure during the war and earlier years.

In spite of all of this, the study is a first approximation to a solution of a problem for which there were essentially no other available data in 1968 upon which to attempt a dose-risk estimate.

It is my understanding that the enforcement agency of Great Britain looks upon these standards as guidelines and not as rigid requirements for all circumstances in which asbestos is used. Thus they recognize the incomplete nature of the data used in developing the numbers.

The lowering of the 1938 standard from 5, to 2 million particles per cubic foot and 12 fibers per cc, adopted by the in 1968 appears to have been based in part upon the data underlying the British proposal and also upon the fact that there was a growing awareness that the old standard of 1938 was not universally effective.

The further lowering of it to 5 fibers/cc was not based upon new scientific data, but appeared to have been made

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to establish a margin of an "factor of safety." In a personal communication from Dr. Herbert Stockinger, Head of the Division of Laboratory and Criteria Development of the National Institute of Occupational Safety and Health and Chairman of the Committee on Threshold Limit Values of the American Conference of Government Industrial Hygienists, I am informed that four months ago, in November 1971, the Committee of the ACGIH reviewed the standard of 5 fibers/cc and found no evidence to indicate that it should be changed. There are several relatively current studies which support this decision.

I would now like to discuss five of these supporting studies. Murphy et al, in December of 1971 published data on workers exposed over a period of approximately 35 years as pipe coverers in new ship construction. The authors demonstrated that no evidence of asbestosis was found until at least 60 million particles per cubic foot years of exposure had been exceeded.

This would indicate that for a forty year period of employment, 1.5 million particles per cubic foot would be the value below which no asbestosis occurred. The report indicated that the actual occurrence of asbestosis was restricted almost solely to those exposed to more than 75 million particles per cubic foot years, which would be close to a value of 2.0 million particles per cubic foot for those employed for forty years.

Utilizing a conservative number to convert particles

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to fibers per cc, but arrives at a level of 5 fibers or more as being that below which no asbestosis was observed.

If one utilizes their konimetar data, one can, by suitable calculations, estimate that the average exposure for these workmen was in the neighborhood of 8 fibers per cc, and this too would suggest that a number of 5 or more fibers pe... cc would have been the level below which no evidence of asbe... developed.

This study indicates not only that the old standard of five million particles per cubic foot is unsafe but also that a standard of 5 fibers/cc will prevent asbestosis in employees working for forty years or more.

An extensive and detailed study of a population comprising thousands of workers, in the mining and milling of chrysotile in eastern Canada conducted over the past few years by Dr. Corbett McDonald and his associates is of great importance in our considerations because this study has dust counts going back many years and chest roentgenograms available from approximately 1935 to date.

Dr. McDonald will report on those studies at these hearings. It is my understanding that these studies support the conclusion that those individuals exposed in these occupations for forty or more years would have to be exposed to higher than 6 fibers/cc in order to reveal any evidence of asbestosis.

Becklake and her co-workers, utilizing a segment of

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the population from McDonald's larger study, have demonstrated that in those individuals who have been employed for long periods of time in the mining and milling of chrysotile asbestos and who do not even show evidence of x-ray changes, the accumulated exposure must have been more than 100 million particles per cubic foot years before the most sophisticated techniques can detect evidence of those physiologic changes thought to develop in response to inhalation of asbestos.

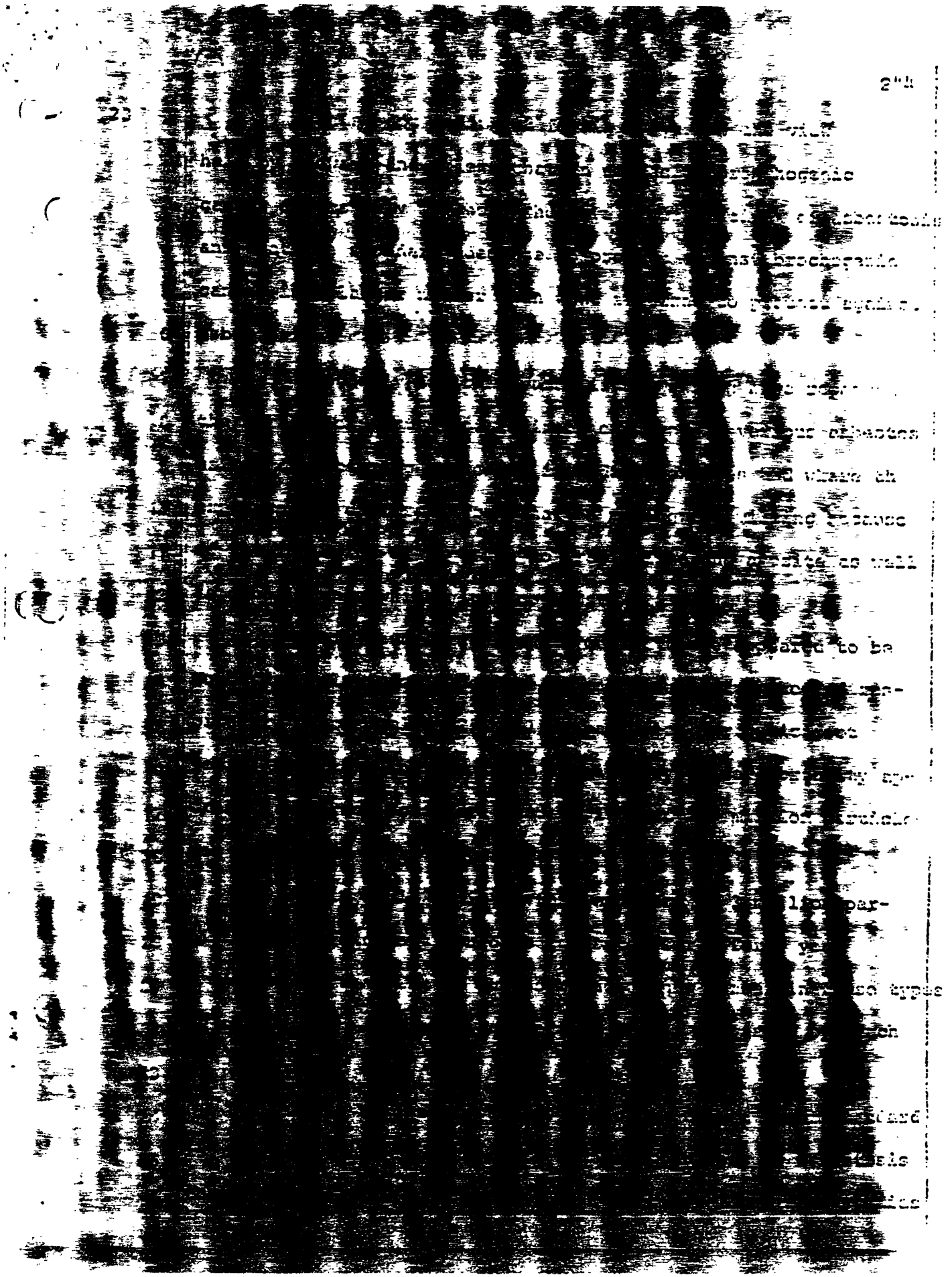
These data suggest that something larger than 2.5 million particles per cubic foot over a forty year period can be tolerated without even the most subtle manifestations of asbestos exposure. This number would translate into something between five and ten fibers per cubic centimeter.

In the fall of 1971 at the Fourth International Congress on Pneumoconiosis, held in Bucharest, Dr. McDonald updated his previously reported large study and reaffirmed that an excess of bronchogenic cancer did not occur in tthe workers in mining and milling of chrysotile asbestos until an exposure equivalent to 200 million particles per cubic foot years was exceeded.

This is equivalent to 5 million particles per cubic foot for forty years. It indicates that in the mining and milling of chrysotile an excess of bronchogenic cancer would not be demonstrable in those individuals who were exposed to less than 5 million particles per cubic foot.

This is equivalent to 10 or more fibers per cc.

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offer strong support for the position taken by the American Conference of Governmental Industrial Hygienists that there is no need to lower the standard below 5 fibers/cc in order to protect against pulmonary fibrosis or bronchogenic cancer.

In my judgment, we have no specific information of a suitable scientific nature expressing the dose risk relationship for mesothelioma. Isolated case reports of mesothelioma are of no value in establishing a dose risk relationship.

Equally useless for this purpose are the data offered in studies of insulation workers, asbestos workers, miners and millers, workers in asbestos using manufacturing, domestic exposures and neighborhood exposures.

Not a single one of these studies offers data comparing variable exposures to the incidence of mesothelioma and they are therefore of no use for establishing a safe level of asbestos in the occupational environment. These studies do indicate that in some circumstances the risk is present but none speak to the question of the safe level on scientifically acceptable grounds.

Nevertheless, these studies of a larger number of cases of mesothelioma suggest that, in some circumstances the exposure to asbestos which may be related to the development of mesothelioma might be less than that required to produce asbestosis or an excess of bronchogenic cancer.

One factor, which has been demonstrated which is with

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respect to the relationship between mesothelioma and inhalation of asbestos is of the utmost importance.

In all of these circumstances where a strong relationship between mesothelioma and the inhalation of asbestos is suspected, two varieties of asbestos, namely crocidolite and amosite, invariably have been implicated either alone or combined. This is the case in the excess occurrence of mesothelioma among crocidolite miners, asbestos using insulation workers, workers in asbestos textile and insulation manufacturing, and in a large multiproduct asbestos using manufacturing plant in the USA.

In most of these circumstances there has been a mixed exposure and chrysotile has also been present. In striking contrast, however, when exposure has been solely to chrysotile, as in mining and milling of chrysotile, the frequency of occurrence of mesothelioma has either not been increased or increased only to the very slightest degree.

The virtual absence of an excessof mesothelioma in populations exposed solely to chrysotile has been reported by Gilson, Vigliani, Wagner and McDonald on the basis of separate studies.

With respect to anthophylite, no excess of mesothelioma has ever been reported. On the basis of information currently in mind, therefore, mesothelioma appears to be predominantly linked with exposures to crocidolite or amosite but the

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dose relationships are unknown.

The studies referred to thus far are the only ones I am aware of which in my judgment have a meaningful bearing on the setting of a standard for control of asbestos exposure. Other data does exist but in my judgment, it does not conform to those criteria, universally agreed upon, for a sound scientific basis upon which to predicate a safe standard.

There is an abundant other body of data which indicates that the prolonged inhalation of asbestos fibers above some level is hazardous, that the biological effect is dose related but that many of the workers exposed for a lifetime never do develop asbestos related disease.

This data indicates clearly that past exposures in some occupations, as for example, the mining and milling of chrysotile, were far less hazardous than exposures in asbestos textile manufacture or the insulation worker's trade and possibly in other occupations as well.

The reasons for these differences are not entirely resolved at this time. Until recently the insulation trade used much more amosite than chrysotile and in some work, especially in England, large amounts of crocidolite have been used.

There are coexisting agents in the insulation trade which are not present in mining and milling of chrysotile. The peak exposures appear to be much higher in the insulation trades than in mining, milling, or manufacturing.

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Work can more [illegible] much more hazardous than [illegible] levels of prolonged exposure. Fiber counts in the insulation work is extremely [illegible] which can be contrasted to Finland, ranged down evenly to hundreds of fibers/cc depending upon the kind of work being done. Fiber counts in the construction industry in this country currently indicate somewhat lower time weighted averages, but the intermittent high peaks of exposure.

For example, during the mixing of asbestos cement, dust counts commonly as high as 75 fibers/cc during a 5 to 10 minute period are reached as often as 3 times or more a day. Unfortunately, there are no data in the insulation worker [illegible] that compare degrees of exposure over a period of many years to the biological manifestations of chronic disease. Until this is available, there is no way of realistic data upon which to establish a standard for the control of asbestos inhalation.

There is every indication that the levels of exposure should be lowered, especially the peak levels, but whether or not a lower time weighted average standard is needed, in the insulation trade than in the other trades remains unsettled.

[illegible] that consideration should be considered more [illegible] than is [illegible]. There is also reason to believe that [illegible] conformities on the fibers in the mining and milling of asbestos [illegible] may be different from those fibers generated subsequently

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in manufacture and use of asbestos.

Moreover, the fibers of crocidolite and amosite even in mining have a different geometric configuration, as actually observed by Timbrell in airborne specimens, for that of some forms of chrysotile. For these reasons the pulmonary retention of chrysotile may be substantially less than for other varieties of asbestos or for the kinds of fibers generated in other occupations than mining and milling. Animal experiments have demonstrated this to be true.

On the basis of data now available and adequate for the purpose, I wish to indicate that in my judgment a standard of five fibers/cc time weighted average with peaks not to exceed 10 fibers/cc such as recommended by OSHA in its present standard and by ACGIH, constitutes a level which will protect against the development of asbestosis and bronchogenic cancer and includes a safety factor since it is a level substantially below that which has been demonstrated to be associated unequivocally with an excess of these two abnormalities.

There is evidence relating crocidolite and possibly amosite to excess mesothelioma which suggest that a more rigorous control of amosite or crocidolite would be justified. For this reason it may be rational to have different standards covering different occupations depending upon the variety of asbestos used.

Since I am in disagreement with the recommendation of

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the Criteria Development Document that two fibers/cc be established as the safe level of occupational airborne asbestos, it is incumbent upon me to indicate the important points of my disagreement.

In my opinion it is now incumbent upon the authors of the Criteria Document to present evidence, which will meet the requirements for scientific validity in support of their proposal to change the standard and to establish a new one.

In the entire document I do not find reference to a single study containing data which will, on the one hand meet the criteria of scientific validity for setting standards, and on the other, support the need to change the standard from 5 fibers/cc or to set it at 2 fibers/cc.

In fact, the Criteria Document explicitly says on page 10 of Section 5: "The number of studies that have collected both environmental and medical data and with a significant number of exposed workers, is not sufficient to establish a meaningful standard based upon firm scientific data."

In other words, the authors of the Criteria Document do not provide any scientific data upon which to base their proposal to change the standard from 5 to 2 fibers/cc or to support the choice of a standard of 2 fibers/cc. The failure to provide this support, in my judgment casts the most serious doubts upon the validity of the proposals.

I am in complete disagreement with the Criteria

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Document with respect to its expressed opinion that the data relating exposure to biological reaction is inadequate to establish a meaningful standard at this time. While the evidence may not be as far reaching as we would like, it is scientifically valid and adequate to support as a first approximation the opinion that the present standard, established by OSHA several months ago at 5 fibers/cc TWA and peaks not to exceed 10 fibers/cc should not be lowered but left as it is.

I have cited the studies supporting this opinion.

Lacking dose-risk relationship data adequate to support the proposal of 2 fibers/cc the Criteria Document appears to promote an aura of extreme toxicity of asbestos fibers in order to justify the new level. This is done chiefly by citing isolated case reports. In my judgment an inordinate amount of weight is given to isolated case reports, which, though of interest and some importance, have no possible utility in setting a numerical standard.

Their use in the Critical Document is doubly difficult to accept in view of the fact that on page 24 of Section III there is the following statement: "Isolated clinical case reports are difficult to interpret in terms of dose-time response relationship and can only be used to indicate other possible areas and to highlight what may prove to be practicable areas for further study."

An attempt to convey the implication of extreme

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toxicity of asbestos in again made on page 7 of Section 3 by reference to a study of 232 former employees in a plant that manufactured insulation.

This study, by Selikoff, is quoted as revealing four employees who develoed x-ray evidence of asbestosis after only one day of exposure to asbestos. Observation of a control group for comparison to those who had been exposed. is totally absent from the Tables for this study that are shown in the Criteria Document.

Murphy's study of pipe-coverers, referred to earlier in this statement, demonstrates beyond doubt that in any adult population not exposed occupationally to asbestos there will be some individuals with x-ray shadows that could be interpreted as evidence of slight asbestosis.

In the absence of suitable controls, Selikoff's study cannot, on scientific grounds, be interpreted to prove that one day of exposure to asbestos causes asbestosis. To do so on the basis of the data shown is epidemiologically unsound and to cite this study as evidence of extreme toxicity of asbestos is completely unwarranted.

The manner in which reports and data of different investigators throughout the world are utilized and criticized does not appear to be uniform in this document. For example, the comprehensive review of the epidemiology of asbestos related cancers by Wagner, et al, published in 1971 is not referred to.

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The report by McDonald, et al, of an extensive epidemiologic study relating dose to risk in 11,780 workers employed in the Quebec chrysotile asbestos mining industry is not discussed in the Criteria Document . This study, published in June 1971 is the single most detailed and complete study of world's literature of the dose risk relationship of one kind of population exposed to airborne asbestos.

The only reference made in the Criteria Document to this study, pages 10 and 20 of Section 3, is a criticism of a "progress report" given by McDonald at the Bucharest meeting in September of 1971. One would think that a study of this magnitude would require discussion in a document intended to be a fully developed presentation of the evidence supporting recommendations of such great importance.

It is difficult to understand why McDonald's report is criticized, as stated at the top of page 20 of Section 3, because of the conversion of numbers of particles to numbers of fibers. Particles are converted to fibers by the British Occupational Hygiene Society in developing their standard and at no place in the Criteria Document, pertaining to the British recommendation, does one see a questioning of that procedure.

If it is acceptable in the one circumstance it should be acceptable in the other.

It is even more difficult to understand the criticism expressed in the last sentence of the 1st paragraph

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on page 20 of Section 1 of there to the effect that the McDonald study lacks the evidence necessary to make general comparisons with the data of other reported work.

The published paper by McDonald's group contains the complete biological data and the required exposure data expressed in millions of particles per cubic foot. This is substantially more data than that furnished by others since it relates exposure to biological effect in the same population whereas other studies such as those of insulation workers do not in any way provide this co-related data.

The index of dustiness used in the McDonald report is the same as in those of Murphy et al, Decouflé-Enterline and Williams, all of which are quoted in this document. The criticism that McDonald did not indicate the details of the method used for converting particles per cubic foot to fibers/cc could easily have been answered by a letter or a telephone call, if the authors of the Criteria Document had been desirous of making the comparisons.

Much weight is given to an unpublished paper by Williams, et al from the Pennsylvania Department of Health. One wonders why, in such an important document as the NIOSH Criteria Package, the crude data of the Williams' study was not shown in the tables of the Criteria Document.

That way in which the sixty-four cases of asbestosis referred to were related to what was undoubtedly a variable

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exposure is, not shown. It is very probable that all of these 64 cases occurred in those who were most highly exposed, very possibly in the neighborhood of five million or more particles per cubic foot.

The failure to handle such data in the conventional dose risk relationships is a serious error. Inordinate and unwarranted attention is given to contemporary dust counts. The impression is given that these present day counts represent the conditions that existed over the past forty years. While this may not be intended, more care should be given to indicate that the counts were substantially higher in the past, especially in manufacturing places where effort toward controlling exposures by exhaust ventilation has been expended in the past 30 years.

In addition, the reduction of the amount of asbestos contained in manufactured materials has further reduced the exposures, particularly in asbestos insulation workers.

Most of the counts in the tables of this document are expressed as averages, for example, tables 13 and 14, pertaining to exposures of insulation workers. This is an inadequate way of displaying data, since it can give misleading information by making high exposures if there are a large number of low exposures to dilute the high ones.

Biological effects are much more likely to occur in those persons heavily exposed than in those with low exposure, thus, averages of all exposures have little meaning or use in determining the dose risk relationship.

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It is not possible to evaluate fully the exposure from the data shown in some of the Tables of this document. For this we need to know not only the time weighted averages but also the peaks, the number of observations and the conditions of the environment during the time of sampling.

This criticism is especially pertinent to the exposures of insulation workers shown in Table 14. The insulation worker experiences great variability with respect to job conditions, to a large degree dictated by the volume of the space in which he works and by natural ventilation as well as the kind of work he is doing at the time.

Dust counts under all sorts of conditions, and peak as well as TWA exposures must be measured before the insulation worker's exposure can be portrayed. With respect to Table 14, it is surprising that the job of "cement mixing", notoriously characterized by peaks of exposure as high as 75 fibers/cc for periods of 5 to 10 minutes several times a day, is omitted.

The summary, on page 16 of Section 5, describing the basis for the new standard recommended by the Criteria Document is confusing and inconsistent. I quote from the second paragraph, "evidence indicates that past and current standards for fiber concentrations in the working places where asbestos fibers occur, though undoubtedly contributing to reduction of the severity and frequency of asbestosis, have not provided complete protection from exposure to asbestos, necessitating development of a new

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standard."

There is evidence that asbestosis developed under some circumstances in places thought to have an average exposure of five million particles per cubic foot, or in modern parlance, thirty fibers/cc.

This was the standard set in 1938. The ACGIH created a new lower standard in 1968 and another still lower, introducing a safety factor in 1970. The British Occupational Hygiene Society suggested numbers that might serve as a standard in 1968.

The current standard in the USA set by OSHA is five fibers/cc and was set only a few months ago. If there is to be a new standard it will be one set since a few months ago, or at most, set since three years ago. The statement in the Criteria Document, to which I have just referred, indicates that the authors have evidence that the standard recommended by ACGIH in 1968 has been inadequate and has not provided complete protection and hence a new standard is needed.

The authors of the Criteria Document should be required to give that evidence and it is obvious that they have not. Could it be that they are referring to the fact that the standard set in 1938 is inadequate and that a better standard is needed?

If so, a lower standard was provided in 1968 and still lower in 1970, and it is this standard which was promulgated as an "emergency standard" by OSHA.

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37 It is this OSHA standard for which I believe there is substantial factual evidence for a suppressive nature.

An even more serious inconsistency is demonstrated on page 16 of Section 5. Close examination of Items a, b, c, and d reveals in unequivocal terms that in the judgment of the authors of the Criteria Document there are no scientifically usable data on which to base a standard.

Nevertheless, without such data they decide that the current standard must be changed and moreover recommend precisely what the new one should be. There is a strong inference from the second paragraph of page 17, section 5 that one and perhaps the chief reason for setting the recommended standard at two fibers/cc, is that the British have recommended such a standard.

I disagree with the concept, if actually intended, that this represents a scientifically valid reason for recommending such a standard. Moreover, it is my understanding that the British did not set a standard in the same sense that it is intended to be used under the new Occupational Safety and Health Act.

The British standard is a series of numbers proposed to furnish a guideline with a wide range of personal judgment on the part of their inspectors as to the need for corrective measures when these numbers are exceeded. Under our act it is my interpretation that a standard is to be set which, if not complied with, places the operator under certain penalties. To my mind the two conditions are utterly different.

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I would like briefly to summarize. In this statement I have described the kind of data required for characterizing the dose risk relationship in such a manner, that it can be used for setting an occupational standard for airborne asbestos on a scientific rather than an arbitrary basis.

Because of the difficulties described, much of the new content, concerning asbestos associated disease, is of no use ofr setting a standard. Isolated case reports and data giving exposures or biological effects without relating the [illegible] in the same population are examples of this kind of unusable information.

Unfortunately, much of the data now available is competent only to say that asbestos is more or is less hazardous in different groups and that the exposure is varied. Nevertheless although not numerous, there are specific data competent to speak to dose risk relationship and these can be used for our purpose. I have cited these.

I have indicated the reasons for my opinion that the Criteria Document have failed to do what which is incumbent upon it, namely, to provide sound scientific evidence to support their proposal for a change from the OSHA emergency standard and for a new standard of 2 fibers/cc time weighted average with peaks not to exceed 10 fibers/cc.

I disagree with the view of the Criteria Document that there are no scientifically obtained data adequate for the

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35 purpose of setting a standard. I have cited the studies which I believe are scientifically valid and adequate for setting a first approximation to a standard or safe level of airborne asbestos in occupational environments.

In my opinion, these studies fully support the current OSHA temporary standard of 5 fibers/cc TWA with peaks not to exceed 10 fibers/cc and the recent decision of the ACGIH that there is no need to change from this standard.

It should be emphasized that prior to 1940 and for some years thereafter, when many of those persons now developing disease were actually being exposed, the dust counts in mining, milling, and manufacturing commonly were in the range of 10 to 100 million particles per cubic foot. This was likely most equivalent to 30 to 600 fibers/cc.

There is no evidence that exposures during that period for insulation workers was substantially lower, and, on the basis of British and Finnish data, it was in that range. It is clear then, that the current OSHA temporary standard represents a tremendous reduction from the dust levels of previous years, and in my opinion includes a substantial safety factor.

I believe this level will protect workers, using asbestos over a forty year or more span of employment, from developing asbestosis or experiencing an excess of bronchogenic cancer. If crocidolite and perhaps amosite are more stringently controlled, the liability of experiencing mesothelioma will

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be markedly reduced and probably abolished.

Thank you, Mr. Examiner.

EXAMINER GOLDBURG: Thank you, Dr. Wright. Dr. Nicholson

DR. NICHOLSON: I am William Nicholson. I appreciate very much Dr. Wright's description of what would be admirable scientific procedure to evaluate the standards to obtain doses over a 40 year period, but let me ask some specific questions with respect to his testimony.

One is with respect to the control -- first, a major question with respect to the needs for a controlled population which is indeed a good point.

Could you, Dr. Wright, tell me what the control population was in Dr. Murphy's study?

DR. WRIGHT: Dr. Murphy's study, his control population was a group of individuals employed in the same shipyard which he stated were not exposed to asbestos.

DR. NICHOLSON: Would that group be in the shipyard?

DR. WRIGHT: I am sure they were on the premises, but Dr. Murphy states they were not exposed.

DR. NICHOLSON: The concern for mesothelioma bears upon the question of the incidence in insulation workers. It has been documented that the disease incidence of insulation workers who work in shipyards and who work in construction sites and never worked in the shipyard are the same.

Could you give us some background as to the amount of

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crocidolite or amosite which was used in insulation work other than in shipyards?

DR. WRIGHT: Well, as you indicate or refer to, the British shipyards did use large amounts of crocidolite, and, in so far as I know the insulation workers, and not shipyard workers in this country, have been exposed primarily to amosite.

DR. NICHOLSON: The materials used by non-shipyard insulation workers is amosite?

DR. WRIGHT: That is right.

DR. NICHOLSON: I have been led to understand that it was predominantly crysotile, and that the total use in the United States of amosite was only about 3 percent, perhaps, and that was in shipyard work construction.

DR. WRIGHT: Mr. Goldburg, there are people in this audience who can answer the question better than I can. I can only do it by hearsay. I think others know exactly what was in insulation over the past 40 years.

EXAMINER GOLDBURG: Just testify to the knowledge you ha.

DR. WRIGHT: My knowledge is that it was predominantly amosite until recently.

DR. NICHOLSON: Perhaps we can have comment later by other members on that point.

The main point I would like to raise now is with respect to the discussion you made on the studies of Murphy, McDonald in the various ways reported, and of Enterline where

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the dust evaluation was in terms of million particles per cubic foot, and you have a conversion here that dust exposure is fifteen now or.

Could you tell me what the conversion factor was that you used?

DR. MARCUS: The conversion factor for the McDonald study he will give in the ensuing presentation. I don't know what it reported.

In converting the number that are given in million of particles per cubic foot from the Hughy study, I utilized a factor of 3, which is about as low as anybody has given, 3 fibers per million particles per cubic foot. Most conversion factors are higher than that.

The one for Dutchline, since it involved textile workers, I used Dr. Lynch's conversion factor of 1.

DR. SELIKOFF: Were these conversion factors experimentally determined in either of the two studies?

DR. MARCUS: I am sure you are familiar with Dr. Lynch's conversion factors. They have all been published. Dr. McDonald will tell you how his were done, by side sampling of impingers. I don't know how they were done by counting the presence of fibers in the dust mask on the machine and making a conversion in that way.

Now the conversion I used in the Hughy study, as I indicated to you, I took the lowest one I knew of, which is two fibers per million, because we made no attempt to make a

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conversion himself. The counts are immaterial, because it is accepted that the fibers were faithfully captured, and utilizing what was in Murphy's paper, namely an expression of the percent of the dust that was made up of fibers, I made the calculation and it comes to an average of 8.

Now that means there is a range on either side. Somewhere higher, in other words, and somewhere lower.

DR. NICHOLSON: Since the dust exposure, that of the mines, that of the insulation workers and that of the textile workers, are so completely different in the magnitude of all th other material as presented there, there certainly is a need for this in terms of fibers.

Moreover, I would suggest that there is a considerable difference in the fiber size, distribution of fibers in each of these separate operations.

Were any measurements done to indicate that the total fiber size was in these operations going to microscopic sizes, greater than five microns to the full range of sub-microscopic fibers present in the atmosphere?

DR. WRIGHT: So far as I know, this was not done, but I would submit we were talking about a standard set on light microscope studies. I am aware of the questions raised by the electron microscope mined fibers, but they have no bearing here.

DR. NICHOLSON: We are talking about a standard set in terms of the quantities of fibers measured longer than five microns.

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But in addition there are the fibers shorter. Do these fibers here not have potential biological effect also and should that fraction, if it is shorter than 5 microns, should that be acknowledged and related to other exposures?

DR. WRIGHT: Dr. Nicholson, if you are talking about those fibers seen in a microscope, you cannot recognize a fiber ---

DR. NICHOLSON: I am talking about all fibers.

DR. WRIGHT: I don't think that sine fiber enters into our discussion. We are setting a standard in terms of light microscope sizes, and if we are going to talk about the electron microscope size fibers we will have a long, long discussion.

I am prepared to have it now if you are prepared to embark upon that, Mr. Goldburg.

DR. NICHOLSON: What -- one makes a comparison of data contained in conditions in which the dust is so different, and is it not appropriate for a scientific study for a desirable criterion to use that total characterization of that dust cloud used for the dose to which you are attributing a response be completely characterized?

DR. WRIGHT: On the basis of science and a better understanding, I agree we need all this information, and there is some information, of course, on this point, but I can only say, again, that I don't see how it is germane to the subject we are talking about.

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OSHA has recommended standards in terms of the microscop

MR. DEGREGORIO: May I ask a question?

EXAMINER GOLDBURG: Go ahead.

MR. DEGREGORIO: May I suggest for the sake of a complete record that the witness answer as many questions as possible within the scope of his knowledge, and leave the questions of what is relevant to one who has to make a decision, so that extraneous information may be kept out of the record, merely on the basis of what the witness thinks is relevant or not? I think that would be a loss to the record.

EXAMINER GOLDBURG: All right.

MR. WOLFE: Dr. Wright, since you support the reduction from 12 to 5 of the allowable number of particals, this in itself is knowledge. That previous thoughts about what was safe, or modifications needed for them, were changed. You mentioned befo at the beginning of your testimony, that a number of workers could be exposed to asbestos without ever developing disease.

The law, as stated, would have no worker develop disease. What I am really wondering is, since the technical feasibility exists to lower levels in plants down to the 2 that has been recommended by the criteria package, why should not one opt now in a maximum direction of safety?

You alluded to the fact that the new 5 standard contai a substantial safety factor. The question I raise is, is it substantial enough?

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In other words, if any possibility exists for any worker to develop disease at that level, why should it not be lowered to 2 until proven otherwise?

You would have the burden of proof be placed on workers or on people developing data to show that it is unsafe, and I think the burden of proof really in the face of something as disastrous as asbestos needs to be to show that it is safe, and if there is any possibility existing, which I think there is, for the development of disease at 2, why can we not go down to there until it can be proven or shown that 2 is too low, and then perhaps it could be built back up?

DR. WRIGHT: I thought I made it as clear as I could that I believed 5 fibers is safe. I think the evidence clearly supports this, in terms of either fibrosis, which we call asbestosis, or bronchogenic cancer. I don't know what the number should be for mesothelioma, but since it is related to a crocidolite and amosite, if we control those two more stringently we would all probability get rid of any mesothelioma.

MR. WOLFF: What would you estimate the substantial safety factor is?

Or obviously one gets diseases at a certain level, and one says, "We want to really insure protection for the worker." On what basis do you agree or disagree with a close substantial safety factor?

DR. WRIGHT: I think the evidence as I interpret it is

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that every worker would be protected. Not percent, in my judgment, would be protected from asbestosis or bronchogenic cancer in terms of this being aimed at a level of 5 fibers.

You have to bear in mind that bronchogenic cancer is a common kind of cancer. Some workers will still get it, but it will not be in excess, and therefore there is no greater risk for them to get it at the 5 level than if they had never walked into an asbestos-using factory.

MR. WOLFF: Since we are dealing with measurement of fibers over 5 microns, and since we are not dealing with the fibers or fibrilles which some people think are related to other sorts of disease, can we not assume at least in a number of instances that there is, particularly when there are other forms of asbestosis mixed with the chrysotile, that going down, again, below 5, down to 2, would not increase the possibility of protecti of workers in some of these other areas?

I agree with your idea that it would probably be more adequate to set other standards for these smaller particles, but at this point we have not, and in a sense going down from 5 to 2 for greater than 5 micron fibers is also going to reduce this exposure to some other carcinogens.

Could you comment on that?

DR. SMITH: Would you rephrase your question so I can get it more clearly?

MR. WOLFF: We are dealing only with the greater than

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five micron fibers. By lowering this number to 2, for instance, or ultimately down to unit, are we not also decreasing exposure to an ever increased count of particles and fibers?

MR. WRIGHT: I think you have to look at that in this way, that that is, however particles you may have in mind, which we are not now measuring, have been there over this past 40 years in that environment while we have been measuring 5 microns and over particles.

There are two ways of looking at this. We do have some documented evidence that the electron microscope size fibers are there in very large numbers in the environment that we now know at the five micron level is a safe level, so far as asbestos is concerned and bronchogenic cancer are concerned. We know th the fibers have been there since asbestos has been in use.

I think this is my way of answering your question, that when we use the light microscope size of 5 microns as being the one it will look at, we are automatically taking care of the EM size fibers, because they have been there all the time.

What you would like to know is, is there a direct relationship between the light sized fibers and the EM sized fibers. That is a piece of information we do not have.

CHAIRMAN CORBETT: Dr. Wright, let me ask you one question. I am asking questions to establish the record. Do I understand you, then, that the measurement of the 5 micron through the light microscope does not establish the consent of the

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smaller fiber which would be discovered by the electron microscope

DR. WRIGHT: You are correct. It does not.

EXAMINER GOLDBURG: There is no established correlation in content?

DR. WRIGHT: Not as yet.

MR. SIEGEL: My name is Edward Siegel. I am a member of the American Council of Governmental Industrial Hygienists and I have a question in regard to Dr. Wright's statement that the ACGIH has said there is no need to lower the standard below 5.

I am somewhat puzzled by this. I am well familiar with the publication of the TLV's, but in the preamble to this, it states that these are only to be used as guidelines. There is no statement that you are not to lower it below this, or raise it above that, for that matter, and I am just wondering if you have received any other pronouncement or letter from ACGIH or on what you base that rather firm figure.

DR. WRIGHT: I don't think that what I said is in conflict with what you are saying. You are absolutely correct that the principal underlying the TLV's is that if you want to go below them you can.

The suggestion is that you not go above them. The evidence that I had is by personal telephone call, speaking with Dr. Stokinger, and I have a letter in my possession sent from Dr. Stokinger saying that the meeting was held, and they

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had considered and can no reason to change the TLV as it currently stands at 5.

MR. SIEGEL: I would say I agree with that, but the preamble to the TLV is not a statement that it should not be above or below.

DR. WRIGHT: I have no disagreement with that; if somebody wants to go below it, we are in the business of setting something here which is a TLV.

MR. DEGREGORIO: At the very beginning of your presentation you set up certain data of scientific methodology. You expressed a view that in order for a study to be correct, in your judgment the study would have to show an accurate relationship between accurate measurements of exposure and the onset of disease.

DR. WRIGHT: The level at which the excess begins to occur, yes.

MR. DEGREGORIO: You mentioned, also, the possibility that a mixture of asbestos fibers and dust with other agents would affect the study. On that point, am I correct in assuming that you mean that the mixture could either increase or decrease the carcinogenic nature of asbestos fiber?

DR. WRIGHT: "you", is the quickest way to answer that.

MR. DEGREGORIO: Fine. Keep it that way. Now in the light of those criteria or methodologies you have considered as of no value, or no use, and I think these are your words, some

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51 studies made on the relationship of asbestos and disease. You
2 have particularly referred, particularly and repeatedly referred
3 to studies made on insulation workers.
4 Could you please name some of those studies?
5 DR. WAGNER: Well, I would say that the studies by
6 Cooper, by Selikoff, by Hames, those come to my mind most
7 quickly. All of them speak of the frequency of occurrence of
8 a biological abnormality, whether it be fibrosis, or whatever.
9 They speak of the frequency of occurrence in the population and
10 study.
11 What is one side of the thing. Not a single one of them
12 rank the severity of the exposure and indicate by such a ranking
13 a comparison to the level at which an excess of these diseases
14 occurs. Not one of them does that.
15 Therefore, they are of no use for the purposes we
16 are sitting here for, namely, setting such a level. That does
17 not mean they are not useful for other things.
18 MR. DEGNAN: What are the things for which they
19 are useful?
20 DR. WAGNER: To indicate that asbestos is a hazard.
21 MR. DEGNAN: I hope it has not. use them that,
22 surely. Those physicians do not waste time proving what I assume
23 a lot of people have already conceded long, long ago, that there
24 is a relationship between certain exposures and diseases, so
25 presumably these researchers have tried to prove something more

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concrete, more definite than that.

Do you know them personally?

DR. WRIGHT: I don't know Hanes personally.

MR. DEGREGORIO: Do you know what they are trying to prove?

DR. WRIGHT: I can only react to that in terms of what they write, which I can examine with my own eyes, and my interpretation of what they write is what I have said.

MR. DEGREGORIO: Do you know what they think the studies prove? I will be more specific. Do you know that these authors you have mentioned, Selnikoff, and Cooper and the others, do you know if any of them believes that his studies or anybody's studies offer good reason to believe that we need a standard lower than 5 fibers to assure the protection of the health of the workers from either asbestosis or lung cancer, or whatever?

DR. WRIGHT: I can only assume from what I have heard Dr. Selnikoff say that he believes this should be below 5. There are times when he says it should be below 2. This I have heard him say. That is a long way from saying he has the evidence to demonstrate that that is necessary.

MR. DEGREGORIO: Do you think Dr. Selnikoff is a competent worker in the field?

[illegible]: I will sustain my own objection to that question.

MR. DEGREGORIO: Would you say, then, on the basis

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53 of your last answer, would you say there is a difference of opinion among the experts in the area, a difference of opinion as to whether something less than five fibers standard is necessary to protect the health of workers?

DR. WRIGHT: I would like you to leave out the term "expert", because that requires me to say who is expert, and I don't intend to do that. But there is a difference of opinion. That is quite clear.

MR. DEGREGORIO: Dr. Wright, you have stressed the importance of peaks. During two days of hearings, cumulative experience has also been stressed as important in producing certain diseases.

Could you tell us if the cumulative experience is also an important factor to consider?

DR. WRIGHT: There is a very scant evidence on this. There is some to suggest, and perhaps Dr. McDonald will refer to this, that if you take dose only, and no time, and this would be what you are talking about, an accumulated dose, that there is a relationship between the excess of all pulmonary fibrosis and dose, but it appears at times equally important, and perhaps it even overshadows this in some circumstances.

Now, my own belief would be that you must have at least some dose. It is hard to believe that you could operate without having some quantity accumulating, but to say that the quantity in the lung of necessity is the controlling factor as to what

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would happen later on, I don't think one could say that and substantiate it.

It is one of the factors. It takes that, plus time. I don't know whether I answered your question. You see, peaks, you have mentioned something about peaks, and they enter into the dose.

MR. DEGREGORIO: Yes, of course.

DR. WRIGHT: Because, as you know, you take any amount of material and you, within the next hour or two, you get rid of a large amount of it. It does not stay in the lung. There is a cleansing mechanism in the lung. Now, the peak doses, and I use the word "may" very advisedly, because I don't know this, but it is possible the peak doses may overwhelm the cleansing mechanism and therefore you might retain more from peak doses than from lower sustaining doses.

It is for this reason that I think peak doses may even be more important than the time weighted averages.

MR. DEGREGORIO: I have heard said, in fact I have seen it written, that there are differences, observable, in the health experience of workers in mining and milling and workers in other occupations.

I think you mentioned more or less the same thing when you referred to insulation. Do you believe that?

DR. WRIGHT: Yes, I believe it. The evidence indicates that.

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MR. DEGREGORIO: Do you know why it happens?

DR. WRIGHT: Well, I touched on that in my testimony. I said it was a matter that was unresolved. I think that in mining and milling you have less opportunity for exposure to other things simultaneously, and furthermore, the geometry of the fibers may be different, because fibers bundles, as you handle them, tend to break lengthwise and split longitudinally. So the more the fiber is handled, the more opportunity there is in the handling of the fiber to have it become smaller and smaller.

The chrysotile fiber in many instances is a curly fiber, which, although its diameter let's say is of a certain dimension, by the time you put the curl in it, it is much broader and therefore it gets intercepted on the mucociliary cleansing mechanism and then comes out.

There are animal experiments that show that if you expose animals to curly chrysotile, the fibers retained are less than if you exposed them to straight crocidolite.

So there are reasons you might use to explain the differences between the miner and the insulation worker.

MR. DEGREGORIO: We have made a distinction, then, between mining and milling and the insulation workers. Do you know of any other differences observed by yourself or others among insulation workers and workers, say, engaged in manufacturing

DR. WRIGHT: The data that is in the literature would suggest that the bundle workers, at least, as reported by Dr. Newhouse, have about the same biological experiences as the

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insulation workers have.

The textile workers that have been reported thus far by Dr. Knox I don't think would have quite the same. They would be a little less severe. When you look at these, that is about all there is in the literature to look at in terms of published data that you can examine and make your own mind up about.

In contrast are the mining and milling experiences, the experiences in Italy, the Cyprus experience reported by Gilleson, and so forth.

The chrysotile experiences of these people are quite concordant, and all speak to the finding that the biological effects have been far less severe in mining than in manufacturing.

MR. DEGREGORIO: That seems to me a very important thing to consider because that seems to caution, at least, to caution us in applying results of studies in mining and milling to workers engaged in other occupations, doesn't it?

DR. WRIGHT: I would agree with you whole heartedly. The only study that, to my mind, would go against this is the underlying data which suggests that at least so far as bronchogenic cancer is concerned, the requirement to develop it is that the exposures are quite heavy, and the studies in England which have led them to believe that the exposure must be heavy enough to have at least produced asbestosis before there is an excess of bronchogenic cancer.

This does not apply at all to mesothelioma, to that

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question.

MR. DEGREGORIO: I won't even keep you long. There is one think you said which is very important before these proceedings, and I want to ask you questions about that.

You have said that there is evidence, to your mind, that we need not go below 5 in order to protect the health of workers. In support of that conclusion, you have mentioned the study by McDonald in Canada, which I understood was made on mining workers.

DR. WRIGHT: Mines and mills.

MR. DEGREGORIO: But your conclusion applies across the board, because we are considering a standard to all workers across the board.

DR. WRIGHT: I included Dr. Hesterdine's study, which is on manufacturing.

MR. DEGREGORIO: Right, yes.

Now, what I would like to find out is this: Do those studies which you mentioned prove that somehow that certain type of groups under observation, that no adverse effect has been shown to result from certain exposures, or do they really prove, to your mind, that such exposures, or similar exposures, will not result in adverse biological effects in other groups in general?

In other words, what I am driving at is this: Can we generalize from these results and apply those results to other groups apart from the question of the differences we have seen?

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DR. WILSON: Well, your question is an extremely important one, and a very searching one. I used the term "first approximation" and I used that advisedly. It should imply very strongly that we don't have all of the evidence necessary to be adamant about all circumstances.

What I am saying is that we are here faced with the problem of having to do something, and we must therefore deal with what we have available to do something with, and the evidence that I have cited includes mining and milling, it includes at least one study of manufacturing, and the data seem strong enough so that in my mind I believe, well, when taken in conjunction with one thing that you may not think is very scientific, and I hope you will permit me one lapse, when you think of the exposures these people operated under in the years when they were having exposures that caused the disease they are now evidencing -- you see, we have no information on people exposed only in the last ten years, and we won't have it for some period of time, because it takes time to develop whatever is going to happen -- if you put these studies together with the fact that we have an enormous reduction, and I think I am as compassionate as most -- in my judgment we don't need to go below 2 until we have more evidence to suggest that we should.

That is what is meant by "first approximation."

Well, when any evidence comes to bear, I think any open minded person would be perfectly willing to accept new

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evidence, but on the basis of the evidence we currently have, and there is one other thing I say that in my mind is so important, and I think we are not subjecting individuals who will work under those circumstances to an excess risk of getting pulmonary fibrosis or bronchogenic cancer.

I made it clear that I am not in a position at this moment to express an opinion in terms of numbers with respect to mesothelioma. The route I have gone here is that I would suggest a more stringent control of crocidolite and amosite, because this seems to be the kind of asbestos that is associated most strongly with excess mesothelioma.

I would recommend a more stringent control, of those two items.

MR. DEGREGORIO: What about chrysotile?

DR. WRIGHT: I would not include chrysotile, because we have evidence that the increase in mesotheliomas is very, very low, and in some studies non-existent, with chrysotile. When you come to pure chrysotile manufacturing exposures, I would have to say we have essentially no numbers, no data. They will be coming within the next two or three years, because there are studies underway at the present moment that should develop that kind of information.

It is hard to find a pure chrysotile exposure, say, in mining and milling. I have sought diligently for a pure chrysotile exposure in manufacturing. I know of only four in the

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asbestos world. I have not been able to persuade one to undertake studies in those plants. That would be extremely important.

Most recently, I think perhaps Dr. Seinkoff's study at the Paterson plant, and I could be corrected on that, but I think it was essentially pure amosite, and that should bring out some very useful information, provided he can construct something about the intensity of past exposure.

That is essential. It can be the intensity of the exposure or the nature of the material, and you must know both of those factors before you can inculminate one or the other.

If you want to say that it is asbestos that is the harmful material, you must also prove then that it occurred in an exposure which was low enough not to do it with other materials. So it gets to be very complicated. I don't know whether I answered your question.

MR. DEGREGORIO: Yes, you did, and I thank you very much.

MR. BARR: I have a few short questions. You did recommend the 5 fiber standard.

DR. WRIGHT: Yes.

MR. BARR: While you did not go into engineering controls, is that the method you would suggest to control to the 5 fiber level?

Generally speaking, I mean?

DR. WRIGHT: Yes. I think that -- I am trying to think back.

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I don't know of any other way to do it.

MR. BARR: Are the engineering controls currently in use designed specifically to lower the exposure level to 5 fibers, and not less?

DR. WEST: Well, I can tell you that in a few there are circumstances where the engineering and the purification gets the fiber count below 5. It has gotten it down to 2, and I use the same exceptions and circumstances where I think it is under 5. But there are still many places where it has been -- it has not even achieved 5 -- and serious efforts will have to be made to get it to 5.

The other thing that I think should be pointed out is that when we set numbers, and this is, I think, comparable to the spirit which the British regulations run in, when we give a number, let's say, of 5, it means that an operator will have to work at 3.

Otherwise, he is going to be out of compliance very frequently, because you never stay right at 3. You go either side of 3. Some of it will fall in 5 or 3 and 6 ranges, and maybe a month later if the weather is somewhat different or if some other factor is different, he could be back in again.

But you get it on 2, he has to operate at 1, or even lower. It has been thought that to give him his margin of safety so he won't be out of compliance.

The British attitude is a little different, I think.

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[illegible] ... I don't know how you would, based on what is going [illegible] ... To get back to your question, I [illegible] ... the way to get there, and I also think that [illegible] ... where it is below 5, and I don't know [illegible] ... encourage people to go below 5. This is many [illegible] ... The problem is that if you put a limit that is unnecessary, you will run the risk of making some parts of the industry not [illegible] ... comply, and you will be asking them to comply unnecessarily, which I don't think anyone wants to do.

MR. BARKA: You also mentioned earlier in your statement that perhaps there was some element of mix of other substances in the exposure factor, and I am sure you are aware that we are attempting to deal with other exposures.

In light of this fact that even though we deal with a particular substance, or a harmful substance we are going to be [illegible] ... of other substances perhaps leads to the toxicity of this particular substance, do you propose that we defer taking anything in each instance? Do you see this as an illogical [illegible] ... on our part?

DR. WAGNER: No, I think that what would be logical would be to make every effort to learn the true culprits, in [illegible] ... biologically relevant to. That is [illegible] ... circumstances.

You cannot ignore the concept that it is mixed

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exposures that do things, especially in carcinogenesis. When you use a pure agent, sometimes nothing happens, when you combine agents, something does happen.

This is the real world. What you strive to do, of course, is that you know the agents that are involved, and these are the ones you try to control. When you don't know the agents, you are not in a position really to do the control.

MR. EARLE: But you would agree to attempt to learn as much as possible about all of them as -- and approach them one at a time so interested parties such as yourself have an opportunity to speak to their particular interest.

DR. WRIGHT: Of course, that is a logical approach, and a very logical and long, hard and tedious one.

MR. EARLE: Agreed.

EXAMINER GOLDBURG: Is there any evidence at this time as to the effect of any other substances combined with asbestos

DR. WRIGHT: Well, yes, if you will permit me, I will do it briefly. There are the striking data that Dr. Selnikoff has, in which, if he excludes the cigarettse smokers, the excessive bronchogenic cancer virtually vanishes. This can be thought to be a premature conclusion in the sense that the numbers involved in the non smoking group are really quite small.

Nevertheless, because the arcoss is quite high, in the then, I think the small number is significant. So that is one thing. Cigarette smoking, which is an -- accepted in the scientific

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54 world mostly --- there are a few people who don't agree -- butmost of the people who look at the scientific data would say there is something which relates cigarette smoking to excessive lung cancer.

When you come to looking at trace material, you take asbestos out of the earth in its raw state and from that time on you handle it mechanically. You start with certain things that are present in the virgin fiber and then you keep adding things to it, and you add some things which are known carcinogens -- nickel, for example-- it takes a very hard steel to, especia with thecidolite, to make it into a form you can use.

So you have the problem of trace metals attached to fibers, and there is some scientific evidence to support the idea that these trace metals may indeed play almost, if not the controlling role, and if we learn that, then, of course you handle that situation by saying, "Don't process your fiber with a material such as nickel."

I am using this as an example only. There is even some evidence which has not been published as yet, but I have been privy to see it, in which it appears some trace metals act as suppressants. You ask are there mixed agents that make you have less chances of malignancy. There is some evidence that this is true, that there are suppressants.

There is the whole question of what do other hydrocarbons which could exist besides those that are in cigarette smoke.

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We know the hydrocarbons are carcinogenic in their own right, and when you begin to have incompletely burned materials, then you form some of these hydrocarbons, and they can be absorbed by asbestos. It is a fairly good absorber, and can be carried on and held inside the lungs.

So there are bits and pieces, the most dramatic, I think, is Dr. Selnikoff's experience.

EXAMINER GOLDBURG: I was thinking in products used in the industry processing. Let me ask you an elemental question which I don't think has been developed on the record. I guess it has been assumed by everyone who has appeared here. There seems to be a general consensus that a fiber level must be established in the asbestos industry. It appears that this is based on empirical study as to the effect of the ingestion of asbestos fibers over periods of time in quantity, and there is dispute as to how much of a period of time and the number of quantities.

Can you tell us what is the peculiar nature of asbes[illegible], the asbestos fiber, as compared to other fibers which are present in the industrial establishments which are ingested by workers over a similar work life period in equal or greater quantity?

What is the peculiar property of asbestos which makes it carcinogenic when other fibers are not?

DR. WAGNER: I was going to answer your question until the last word, and then I would have to say I don't know what

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makes it carcinogenic. For fibrogenesis, making scars in the lung, we have some observations which don't lead to a final definitive conclusion of the kind you would like. Just let me say that I don't know about the carcinogenesis end of it.

There are data including some going on at the present time in my own laboratory, because I am looking specifically at the question of what is the relationship between the geometry of a fiber and the biological reaction in terms of scar or fibrosis, and one thing that is clear, you have to have a fiber that can be inhaled, and retained.

Because something does not happen even very abruptly. It takes time, and it also takes some amount, that is, there has to be a volume of the material present. I have animal lungs that you could look at where you can see one fiber, and no reaction, and in another place in the lung if there are 15 or 20 fibers, there will be a reaction.

It looks as though one thing that has to happen is that you must have numbers. It must, of course, get there and stay there long enough for something to happen. There are some fibers that are curly that fall out high in the air tubes, and you swallow them or cough them up.

Let's say they get in. Fibers that are small enough to go inside a cell which we call a macrophage, which means a big eater. It is a cell which has the ability to engulf all kinds of things.

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67 If the fiber is short enough or flexible enough to be taken into this single cell, or into a complex of half dozen of these cells, it appears on the basis of what I know about it that such fibers are neutralized and don't do anything. They sit there surround by cells so to speak. That is quite in contrast with what happens with particles where the problem is the reverse.

The cell is killed by the free crystalline silica. This is not ture in the data that I know of with respect to asbestos fibers. When the asbestos fiber is long enough to not be totally engulfed, it appears that then this is the size fiber that does cause the fibrous tissue.

How does it do it? I haven't the answer. There are people who are looking at whether it is a chemical reaction between the surface of the fibers, or whetner it is the fact that you have a long structure sitting there which can act as a physical irritant.

I don't think we are in a position to begin to answer that. But I do think we have on the basis of experiments that others have done, on the basis of experiments that I know of that are going on now, short fibers, less than 5 microns long, they do not cause fibrosis in the lung.

The fibers must be longer than that, and that is of importance to us. Our standards are expressed in terms of fibers longer than 5. That only goes to fibrosis. I have no comment about carcinogenesis.

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EXAMINER GOLDBURG: Thank you very much.

MR. BRODNEUR: Dr. Wright, you stated that a standard of 5 fibers per cubic centimeter would be sufficient and it would not be necessary to go lower than that. In describing standards that existed previous to that, you mentioned that the recent standard which had been in effect for about 30 years previous to 1968 was the equivalent of 30 fibers cubic centimeter.

You have told us during that time you worked on asbestos disease and related pneumoconiosis at Saranac Lake, and since 1953 in a Department of Saint Luke's Hospital.

I wanted to ask you, in these 30 years in which there was a standard in effect, did you at any time publish recommendations in any reports to lower that standard?

DR. WRIGHT: No.

MR. BRODNEUR: Subsequent to 1968 when a standard was an inadequate standard and was lowered to 12 fibers per cubic centimeter, did you between 1968 and the present time, or say last December when OSHA took up the emergency standard of five fibers, did you at any time publish recommendations that the 12 fibers per cubic centimeter be lowered?

DR. WRIGHT: No.

MR. BRODNEUR: What I would like to know is, do you feel the 5 fibers per cubic centimeter is exactly the right level, or would you revise it upwards, or downwards, sir? I would -- I know you wouldn't revise it downward, but where are

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you as far as what you feel would be safe?

DR. WRIGHT: I am right on the 5.

MR. BRODNEUR: Thank you, sir.

MR. ST. LAURANT: My name is Yves St. Laurant. Dr. Wright, you were at Saranac way back in the 1930's, am I right?

DR. WRIGHT: Well, the late 1930's.

MR. ST. LAURANT: The director, the most important director of research work then was Dr. Garten?

DR WRIGHT: He was director, and I considered him an important man.

MR. ST. LAURANT: His first works were published in 1931 with comments on inhalation of asbestos dust and the experimental studies on pneumoconiosis -- 1931.

DR. WRIGHT: You have reviewed it more recently than I have. I will accept your 1931 date.

MR. ST. LAURANT: And in the years up to his death he was very closely assigned, to your personal knowledge I ask, to the problem relating to dust in our mines of Quebec Provin- where I am from?

DR. WRIGHT: Yes, he was.

MR. ST. LAURANT: These are the same mines which were the object of the studies of Professor McDonald of McGill University, who was here today, am I right?

DR. WRIGHT: Yes.

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MR. ST. LAURANT: Do those mines constitute, according to your knowledge, a reservoir that has been supplying the free world up to 85 or 90 percent of the crystals for the last 40 or 50 years, although mining started up there a century ago?

DR. WRIGHT: I understand that the proportion of the free world supply of asbestos is mined there.

MR. ST. LAURANT: Did I understand you rightly when you stressed it seemed to be a paramount, if not the paramount study, at least as to mining, in connection with pure chrysotile asbestos?

DR. WRIGHT: Yes.

MR. ST.LAURANT: Did I hear you say that Mr. McDonald reported that the incidence of bronchogenic cancer there did not seem to be in excess of the rate affecting the population at large?

DR. WRIGHT: I did not say that, but I understand that the study showed that.

MR. ST. LAURANT: Are you aware, Dr. Wright, that you are considered to be the top consultant in the field in my opinion? Are you aware that there were studies at Saranac from time to time such as the Truzin and Brown study? Brown is at Pittsburgh now, I think. These dealt with the incidence of cancer in the asbestos belt, I would call it, across Quebec, and that this study did also point -- that was in 1954 or 1955 -- did point out that the incidence of cancer did not seem to be in

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excess, maybe not in a substantial portion anyhow, to that existing in the general population?

DR. WRIGHT: That is the substance of the Brown report.

MR. ST. LAURENT: Are you aware of the Metropolitan Life ---

MR. EARLE: May he answer?

DR. WRIGHT: I don't believe the Brown-Trurin study is the Saranac Lake study. I gather from what you said that you were inferring that it was.

MR. ST. LAURENT: No, it was an Industrial Hygiene Foundation study. I am sorry, sir. I should like to respectfully ask you if you are aware, also, that the Metropolitan Laboratory conducted an independent study under George Levy, who is now vice president, and I am speaking about in the 1940's, the same asbestos belt of Quebec, as to the incidence of tuberculosis or pulmonary conditions in Quebec and they found as to tuberculosis that the incidence was that of about the general population at large?

MR. EARLE: Mr. Examiner, with all due respect to our visitor from Canada, if he does wish to testify, we would like him to take the stand so that we may have an opportunity to question him about these studies.

MR. ST. LAURENT: I don't think I should testify, but maybe I would be allowed to put one or two more questions just to underscore the importance of the names, because we spoke the

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name of Professor Gilson, and Wagner, who have reported as to important data in connection with the problem now under consideration.

Gilson, is that the Gilson that I know, that you know, who is in charge of the pneumoconiosis research bureau in Great Britain?

DR. WRIGHT: Yes.

EXAMINER GOLDBURG: I am going to cut you off on this, sir. You are testifying, not asking questions.

MR. ST. LAURANT: I am guilty.

EXAMINER GOLDBURG: I would seek to save you from sin, sir.

(Laughter)

EXAMINER GOLDBURG: Is there anything further of this witness? Thank you, Dr. Wright. You have been very helpful.

Off the record.

(Discussion off the record)

EXAMINER GOLDBURG: We will recess.

(Whereupon, a brief recess was taken.)

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DL-1-105
MAY 1965

U.S DEPARTMENT OF LABOR

Washington

PLAINTIFF'S EXHIBIT Snell 14 66 12-13-78

RECORDS AUTHENTICATION CERTIFICATE

I HEREBY ATTEST, That the annexed copy, or each of the specified number of copies, of each document listed below is a true copy of a document in the official custody of the Department of Labor.

1 copy each of:
Transcripts from March 14,15,16, and 17
Comments and hearing exhibits of:
W.J. Nicholson, American Petroleum Institute, D.A. Holaday, Brand Insulations Inc., L.J. Bibri, B.J. Phillips(Certain-teed), M.W. Borow, J.D. Moran(Flintkote), F.L. Pundsack(J-M), J.W. Rawlings, W.M. Hancock(Dow), W.K. Hesse(J-M), E.M. Fenner(J-M), E.J. Killian(Nat. Gypsum), Cement Asbestos Products Co., M.M. Key, G.E. Best(MCA)

SIGNATURE AND OFFICIAL TITLE	DIVISION AND BUREAU	DATE
Daniel J. Marsick Technical Information Specialist	Docket Office/Technical Data Center/Occup. Sfty & Hlth Adm/ U.S. Dept. of Labor	7 Sep 78

I HEREBY CERTIFY, That Daniel J. Marsick who signed the foregoing attestation, is now and was at the time of signing (title) Technical Information Specialist and has legal custody of the official records of the United States Department of Labor therein attested and that full faith and credit should be given to his act as such.

IN WITNESS WHEREOF, I

J. J. Lafranchise

duly designated by the Secretary of Labor as Authentication Officer of the Department of Labor, have hereunto subscribed my name and caused the seal of the Department of Labor to be affixed this 7th day of September 19 78.

J. J. Lafranchise
Authentication Officer
Department of Labor

M-311 181

UNITED STATES DEPARTMENT OF LABOR

WASHINGTON, D.C.

In the Matter of:	
STANDARD FOR EXPOSURE TO ASBESTOS DUST, PROPOSED RULE MAKING	PUBLIC HEARING

Conference Room B
Interdepartmental Auditorium
12th & Constitution Ave., N.W.
Washington, D.C.
Thursday, March 16, 1972

The above-entitled matter came on for further hearing, pursuant to recess, at 9:00 o'clock, a.m., Thursday, March 16, 1972.

BEFORE:

ARTHUR M. GOLDBERG, Hearing Examiner

APPEARANCES:

(As heretofore noted.)

CRMC-Motley1000-Subj-001526

Henry B. Morgan, and I am the Senior Operating Vice President of Johns-Manville responsible for the company's Industrial and International Divisions.

I am a graduate of the University of Southern California with a bachelor's degree in Electrical Engineering and post-graduate work both at that institution and at the Harvard Business School. For the past 32 years, I have held various sales, marketing, production, general management and senior management positions with Johns-Manville.

As our testimony thus far has indicated, we support the present OSHA emergency standards if they are modified as suggested by Johns-Manville associates here today.

I would like to address my remarks primarily to the engineering problems involved and the economic impact of implementing the standards. I will do this by relating personal experiences and by presenting other information that we have developed for this hearing.

Five years ago, I was given responsibility for our Packings and Friction Materials Division. This is the division in our company which has many of the asbestos handling problems especially in its asbestos textiles and friction material operations.

During those five years and right up to the present time I have devoted a great portion of my time personally to improving in plant environmental conditions for our employees,

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particularly those working with asbestos fiber.

For the last four years, our goal has been to bring all of our operations to a Threshold Limit Value of five to six fibersper cc, which is half of the previous LTV standard of 12 fibers per cc.

Since we at Johns-Manville began our active dust control program many years ago, we can speak from experience about the difficulty ahead of achieving 5 fibers per cc and solving environmental problems. Perhaps a specific example will help give some insight to our activities.

One of our largest plants is located in Manville, New Jersey. It is a multi-product plant containing, among other things, a fairly extensive, integrated textile operation.

I first visited the Manville plant in 1949. Even though we were unaware of specific health hazards, I can remember the high visibility of dust which clouded the ambient air inside the textile building.

The personal sampler method of measuring dust was not available then, but certainly -- if we could have measured them by that method -- we would have determined that the counts around some equipment were over 100 fibers per cc.

The next time I saw the operation was several years later during the 1960's. By that time, great improvements had taken place as a result of the studies and developments Mr. Jobe discussed in his testimony.

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Extensive dust collecting systems were operating and the plant was using much cleaner asbestos fiber now available because of improved equipment at the mines in Canada.

When I assumed responsibility for the Packings and Friction Materials Division late in 1967, the Manville textile operation was included. Maximum dust counts were about 30 fibers per cc.

When we embarked upon our program to reduce all counts to five or six fibers per cc, it soon became apparent that we had reached the practical limit of improving the system by collecting dust and other similar mechanical means.

A complete redesign of process and equipment was mandatory. We assembled a team of the best experts available within our company and talked to manufacturers in both the United States and Europe to determine if improved asbestos textile machinery were available, that would perform within the dust levels we had specified.

After several months, it was determined that if improved equipment were to be made available, we would have to design it ourselves. This we proceeded to do, and after a three year concentrated program, we have completed the installation of special designed equipment and processes in which in many cases are substantially different from what we had before and the methods currently being used by other asbestos textile producers.

Even though our operating costs have risen over

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fifty-percent due to our industrial operating procedures, we are quite pleased with the results.

One can now look down the full length of the approximately 900 foot building through nearly crystal clear air. This is a dramatic improvement from the appearance three years ago and fantastic considering the operations as I first viewed it in the late forties.

Most of our dust counts are now below five fibers cc. Note I said five not two, fibers per cc. If we are required to operate at the two fibers per cc level, I can see no other solution for us but to shut down some equipment. Having brought the counts from 100 fibers per cc to their present levels has been a major accomplishment particularly when one considers that medical results that concern us all were incurred under the far more dusty operating conditions and not under our current modern methods.

I have selected the textile operation for my comments today because that is one which required a great portion of my personal effort and is typical of our corporate program. We are working on all of our othe product lines as well. Asbestos is used in a wide variety of applications, each requiring specific process and equipment design. We could cite instances involving friction materials which pose as complex a problem as the textile operation did.

In operations where equipment redesign is not

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sufficient to reduce dust counts to an acceptable level, complete and sometimes radical changes must be employed.

These changes most often alter the finished product substantially. When the properties of a high performance friction material are changed for instance, extensive testing in laboratories and in the field must be conducted in order to be certain that the product will perform as required under all conditions, as a failure might cost hundreds of lives.

Can you imagine, for instance, a one hundred car freight train operating with unproven brake linings? Or a natural gas pipe that has exploded because of inadequate fiber reinforcement? In some cases, material tests and validations require as much as four to five years.

It is obvious that protecting our environment is a constant and evolutionary process, not one which could be totally implemented by abrupt and severe legislation.

What is the current status of our dust control program? In spite of the know how and our concerted effort and a recent capital expenditure outlay of some twenty million dollars, I must say to you that twenty percent of our sampled dust stations are still operating over five fibers per cc, although virtually all are under 10 fibers per cc, and more importantly, because we have been unable to reach our desired goal for dust control in a number of our operations, we have discontinued the production of over five million dollars worth

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of asbestos-containing [illegible] and have thus had to put over three hundred workers into the unemployed ranks.

As I said before, all of our work has been directed toward attaining a TLV of five to six fibers per cc because experience and medical advice indicates that this is the most practical approach to providing a safe environmental atmosphere for our workers.

To do this requires extensive engineering. For this reason -- to reach a TLV of five fibers per cc actually means designing equipment which will operate at about a three fiber per cc level because we must allow for measurement inaccuracies, human error, maintenance, and climatic variations.

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there have been two sources--1. other manufacturers in the United States, some of whom have not as yet experienced the economic impact of attempting to achieve five fibers per cc; and (2) foreign manufacturers.

Even though Johns-Manville has the financial resources to pay for more sophisticated equipment, higher costs must ultimately be reflected in price increases. In our industry this, in many cases would just mean paving the way for foreign competitors. Already substantial and increasing quantities of fabricated asbestos materials being imported from Japan, Taiwan and South America are invading the U. S. markets. Some of our own surplus equipment has been sold to a company in India so we presume that India and possibly other Asian countries will increase their production and sales of asbestos materials to our country as it becomes more uneconomical to make these products inside the United States.

Attempting to achieve a standard of two fibers per cc will cost American industry millions of dollars in increased operation costs and, unfortunately, cause a significant number of jobs to be shifted to foreign workers for whom, in many cases, no environmental standards whatsoever will apply.

The present OSHA emergency standards--with modifications--provide a good margin of safety and, based on our experience, are attainable in most manufacturing operations if the producers are given a reasonable time to design and

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The cost of modernizing and building equipment to operate at lower dust levels increases exponentially--not in a linear fashion. If the TLV were to be set at two fibers per cc, it would require capital expenditures of $12 million and additional operating costs of $5 million per year to bring our operations to the two fiber-per-cc level in those processes where we believe we could develop the capability to do so.

At the present time, approximately half of our present dust stations show consistent readings over two fibers per cc. Included in this group are five manufacturing plants, involving approximately 1100 workers. As we see it now, it would not be economically feasible for Johns-Manville to attempt to operate these plants at a standard of two fibers per cc. We estimate that 1100 workers would be out of jobs at these locations. And when you add supporting sales, clerical, research and administrative personnel, we are talking about a total of some 1600 employees who would have to join the unemployed.

Since Johns-Manville is quite typical of thousands of other asbestos product manufacturers and users in the United States--it is obvious that the overall effect of lowering the present threshold limit to 2 fibers per cc would have a very substantial effect on our nation's economy.

I would ask this question: Where will our customers obtain these materials that we no longer produce?

In the case of the products we have phased out so far,

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install the necessary equipment and implement process changes.

The establishment of an unnecessarily stringent standard and the requirement of unnecessarily frightening labels, as commented on by Dr. Pundsack, would merely cause confusion and perhaps harm to many very reputable companies.

In conclusion, I want to say this quite directly with no scientifically credible evidence to prove the need for such a low TLV standards of 2 fibers per cc, it would be nothing less than complete social irresponsibility to adopt it.

We believe the Department of Labor must establish standards that protect the worker, but at the same time are practical and realistic--and mostly--attainable.

On behalf of myself and my associates, thank you for permitting us to testify today.

Mr. Goldberg, that concludes my testimony unless you want to allow me an opportunity to respond to Dr. Nicholson's questions regarding insulation material.

EXAMINER GOLDBERG: Do you wish to do so?

MR. MORENO: I will be pleased to speak if he so desires.

Dr. Nicholson, do you still want an answer?

MR. NICHOLSON: Yes.

MR. MORENO: I am told, Dr. Nicholson, Mr. Spicondo yesterday submitted an analysis of insulating materials which is in the record. In addition to that I will gave you my

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personal observations over the last 22 years in which I have been involved and I think that is probably what you are after.

Twenty years ago or twenty-two years ago, almost any high temperature insulation had amosite fiber in it. I would say every ship built during World War II and afterwards until within the last ten years had large quantities of Amosite insulation because there was in effect a cloned navy Federal spec. specifying a particular type of insulation with a high percentage of Amosite.

This was done, I think, because no one really realized the dangers involved and secondly because this asbestos fiber with Amosite fiber in it had great mechanical strength and could withstand the mechanical abuse. This material was also used widely in industrial applications. The other materials used in those days were generically called in the industry 85 per cent magnesium and calcini denecious earth insulations both of which contained approximately 15 per cent by weight amosite asbestos fiber.

Starting about 1958 the trend was away from these two insulations. That is the 85 per cent magnesium and calcini materials in favor of another material that had a better temperature limitation. 85 per cent magnesium had a temperature limitation of 600 degrees and the other had a temperature limitation of about 18 or 19 hundred degrees Fahrenheit, depending on how you wanted to measure it so, for a process mine, for

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instance that had an operating temperature of 1200 degrees, it was necessary to apply two layers of insulation, the first layer that could stand the 1200 degrees and then the next insulation which was 85 per cent magnesium that could only stand up to 600 degrees.

During the late Fifties a new insulation was developed and this is a material that is called calcium silicate and this is reinforced originally--I believe it might have have had some Amosite in it but during the past 12 years it had only had Chrysotile fiber in it. This is a material that today has replaced all of the other three materials in almost every application. As a matter of fact, the Amosite material that I referred to in the Navy specifications no longer is produced. The calcium silicate material originally when we introduced it had 12 to 15 per cent Chrysotile fiber and today we are operating with about 8 per cent Chrysotile fiber. Then in answer to your question, if I remember it, there has been a tremendous change in the kinds of insulating materials used particularly in the last twelve years. Do I remember your question correctly, sir?

MR. NICHOLSON: My question specifically refers to non-shipyard insulation material and the question was specifically related to that quantity of Amosite that would have been in all of the industrial and commercial insulations over many years. It is my understanding that Amosite was used very

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little in this country prior to World War II. The total imports could be listed in tens of thousands of tons rather than millions of tons. Could you give us an estimate of the fraction of Amosite that would have been used in commercial non-shipyard or industrial non-shipyard insulation work from the period of say roughly 1930 to 1940 to the current time the period of time being that over which we have experienced the health effect upon the insulation workers using that material.

MR. MORENO: May I break it in two periods. From 1930 if you want to take it or the thirties until about 1960 and then from 1960 to the present time. During the earlier period, to my knowledge every high temperature insulation except rock wool which was used in some areas--every high temperature insulation had Amosite fiber in it because they had 85 per cent magnesium, the calcium Amosite, sir, and the other material we talked about so every product that I know of had some Amosite in it. Since 1960 there has been a decreasing amount of it and I would say within the last three to five years almost none.

MR. NICHOLSON: Would the percentage in all insulation prior to 1960 percentage of asbestos which was more than 50 per cent Amosite/in all insulation used prior to 1960 in non-shipyard work?

MR. MORENO: Industrial of 300 degrees.

MR. NICHOLSON: Asbestos insulation.

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MR. MORENO: And Amosite and that quantity varied from as low as 15 per cent to as high as 50 or 60 per cent and I am not certain about the 50 or 60 per cent only because we didn't manufacture the product. I know in my own mind it was at least 50 per cent Amosite fiber. Our own products had 15 per cent Amosite asbestos fiber in them.

MR. NICHOLSON: Fifteen per cent of the fiber of the asbestos was Amosite.

MR. MORENO: No, sir. All of the products I was involved in was all Amosite.

MR. NICHOLSON: Thank you.

EXAMINER GOLDBERG: Thank you, Mr. Moreno.

MR. PUNDSACK: Mr. Goldberg, that completes the testimony of those testifying on behalf of Johns-Manville. However, Dr. McDonald, whose work has been referred to by Dr. Wright and also cited in the NIOSH document wishes to testify as an individual witness representing himself.

EXAMINER GOLDBERG: Dr. McDonald, we appreciate your coming down from Montreal to be with us.

STATEMENT OF DR. J. CORBETT McDONALD,

MCGILL UNIVERSITY, MONTREAL, CANADA.

DR. McDONALD: My name is John Corbett McDonald; I am professor of Epidemiology and Chairman of the Department of Epidemiology and Health at McGill University, Montreal. I graduated in medicine from London University in 1942 and have

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DL-1-105
MAY 1965

U.S DEPARTMENT OF LABOR

Washington

PLAINTIFF'S EXHIBIT Snell 14 66 12-13-78

RECORDS AUTHENTICATION CERTIFICATE

I HEREBY ATTEST, That the annexed copy, or each of the specified number of copies, of each document listed below is a true copy of a document in the official custody of the Department of Labor.

1 copy each of:
Transcripts from March 14,15,16, and 17
Comments and hearing exhibits of:
W.J. Nicholson, American Petroleum Institute, D.A. Holaday, Brand Insulations Inc., L.J. Bibri, B.J. Phillips(Certain-teed), M.W. Borow, J.D. Moran(Flintkote), F.L. Pundsack(J-M), J.W. Rawlings, W.M. Hancock(Dow), W.K. Hesse(J-M), E.M. Fenner(J-M), E.J. Killian(Nat. Gypsum), Cement Asbestos Products Co., M.M. Key, G.E. Best(MCA)

SIGNATURE AND OFFICIAL TITLE	DIVISION AND BUREAU	DATE
Daniel J. Marsick Technical Information Specialist	Docket Office/Technical Data Center/Occup. Sfty & Hlth Adm/ U.S. Dept. of Labor	7 Sep 78

I HEREBY CERTIFY, That Daniel J. Marsick who signed the foregoing attestation, is now and was at the time of signing (title) Technical Information Specialist and has legal custody of the official records of the United States Department of Labor therein attested and that full faith and credit should be given to his act as such.

IN WITNESS WHEREOF, I

J. J. Lafranchise

duly designated by the Secretary of Labor as Authentication Officer of the Department of Labor, have hereunto subscribed my name and caused the seal of the Department of Labor to be affixed this 7th day of September 19 78.

J. J. Lafranchise

Authentication Officer
Department of Labor

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UNITED STATES DEPARTMENT OF LABOR

WASHINGTON, D.C.

In the Matter of:	
STANDARD FOR EXPOSURE TO ASBESTOS DUST, PROPOSED RULE MAKING	PUBLIC HEARING

Conference Room B
Interdepartmental Auditorium
12th & Constitution Ave., N.W.
Washington, D.C.
Thursday, March 16, 1972

The above-entitled matter came on for further hearing, pursuant to recess, at 9:00 o'clock, a.m., Thursday, March 16, 1972.

BEFORE:

ARTHUR M. GOLDBERG, Hearing Examiner

APPEARNCES:

(As heretofore noted.)

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EXAMINER GOLDBERG: All right, sir. We will mark as Exhibit No. 37 Western States Asbestos Health Plan, and as marked Exhibit No. 37 is received.

(The document referred to was marked for identification as Exhibit No. 37 and received in evidence.)

EXAMINER GOLDBERG: Do we have any more second thoughts before we call the next witness?

Mr. Sheckler and Mr. Royer, are you appearing together?

MR. SHECKLER: Yes, Mr. Examiner.

I am Clifford L. Sheckler, Chairman of the Safety and Health Committee, National Insulation Manufacturers Association. I am appearing before you today, along with Mr Spence Royer, representing the National Insulation Manufacturers Association and the National Insulation Contractors Association.

The membership of both Associations wish to express opposition to the proposed standard for asbestos dust as published in the Federal Register, Wednesday, January 12, 1972. We wish to express our opposition to the recommendations of the Advisory Committee on asbestos dust, and the National Institute for Occupational Safety and Health criteria document.

The National Insulation Manufacturers Association represents the manufacturers of Thermal Insulation products in

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the United States. The National Insulation Contractors Association represents the major Thermal Mechanical Insulation Contractors engaged in both the construction and shipbuilding industries throughout the United States.

Our comments will be directed specifically to the application of asbestos containing insulation products and not to the manufacturing of such products.

The construction and shipbuilding work currently underway by our Thermal Mechanical Insulation Industry is being done under both government and private contracts. Federally funded contracts involve office buildings, hospitals, schools, libraries, missile facilities, defense projects, dams, airport facilities, rapid transit systems, low rent housing, military housing, air and water pollution prjects, shipbuilding and ship repairing for the U. S. Navy - Coast Guard - Merchant Marine and Army.

Private funded contracts include office buildings, hotels, theatres, refineries, power generating plants, chemical plants, other types of industrial plants, housing, University buildings, hospitals, and others.

We, in the thermal mechanical insulation construction industry, excluding the manufacturing of insulation products, and considering only the installation of this material, directly involve approximately 40,000 job opportunities in the United States.

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This industry represents an approximate $700 million gross volume of business annually.

Our industry is comprised of over 1000 contractors. Most of these contractors are small businessmen spread throughout the United States. Mr. Royer, who is here with me today, is one of the small businessmen who will present you with his views.

Our opposition to the asbestos dust standards are based on the fact that they are neither reasonable, practical, feasible, or economically sound. Much of the information for establishing the proposed asbestos dust standards, the NIOSH criteria package, and the Advisory Committee's recommendations was gathered from experience in this Thermal Mechanical Insulation Industry.

Let us review the course of events concerning the threshold limit value for asbestos dust over the past few years. In 1970 the American Conference of Governmental Industrial Hygienists Threshold Limit Value for Asbestos Dust was published at 5 million particles per cubic foot of air as measured with the impinger method. We were able to work with this standard. At that time the majority of State Departments of Labor and Health maintained the same Asbestos Threshold Limit Value. In December, 1970, the Occupational Safety and Health Act became law. In 1971, the first set of safety and health standards became effective. The threshold limit value

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for asbestos dust then became 12 fibres per milliliter greater than 5 microns in length as measured by the membrane filter. This industry did not question the reduction of the threshold limit value from 5 million particles per cubic foot to 12 fibres per milliliter, and the complete change of the method for monitoring asbestos dust, instead, we immediately went to work by introducing new methods, equipment, and materials, to reduce dust levels to within the 12 fibre limit.

On December 7, 1971, Emergency Asbestos Dust Standards were published in the Federal Register again reducing the Threshold Limit Value for Asbestos Dust from 12 fibres per milliliter greater than 5 microns in length to 5 fibres per milliliter greater than 5 microns in length. On January 12, 1972, the proposed asbestos dust regulations, with a Threshold Limit Value of 5 fibres, was published in the Federal Register. [illegible] in conjunction with these proposed regulations, both NIOSH and the Asbestos Advisory Committee have made recommendations for further reduction of the Threshold Limit Value for asbestos dust to 2 fibres per milliliter greater than 5 microns in length. You now have a picture of the inconsistency and uncertainty involved in the establishment of an Asbestos Dust Standard.

From 1970 to date, a period of just over two years, the Threshold Limit Value for asbestos dust has been changed from 5 MPPCF to 12 fibres, then to 5 fibres, with a current

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recommendation for a 2 fibre level. With each of these Threshold Limit Value changes there have been many other related requirement changes that add to the total confusion, such as respiratory equipment, dust collection, vacuum cleaning equipment, and others. The change from 5 MPPCF to 12 fibres has been a costly one. Our industry has, with some difficulty, absorbed this cost. We frankly cannot meet the 5 fibre Emergency Asbestos Standard as currently effective, nor can we absorb the cost of the Emergency or Proposed Asbestos Standard and its related provisions. It is needless to say, therefore, that to achieve a 2 fibre standard as recommended by the NIOSH Criteria Package and the Asbestos Advisory Committee, is neither practical, feasible, or economically possible.

Let's carefully examine the reasoning for the erratic revisions of the Asbestos Threshold Limit Value since 1970. As I have already told you, much of the information which contributed to these revisions was gathered from our Thermal Insulation construction industry. At its best, this information is scanty, inconsistent, incomplete and inaccurate. First of all, I told you that at the change of Threshold Limit Value from 5 MPPCF to 5 fibres per milliliter there was also a change in the method for monitoring asbestos dust from the standard or midget impinger to the membrane filter. There is absolutely no method for correlation between the asbestos dust counts determined by monitoring with the impinger as compared to the

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membrane filter. It is, therefore, impossible to compare the exposure levels in terms of numbers of fibres per milliliter greater than 5 microns in length with numbers of particles of total dust when using the impinger method. It must be recognized that the impinger method included particulate matter other than asbestos fibre.

Physical examinations on a part of the work force installing Thermal insulation materials have been conducted. The disease involvement determined by these physical examinations has been related to the present day asbestos fibre exposure as monitored by the milapore filter method. These factors cannot be compared or related. Also, based on supposition and assumption, it was concluded that the exposure levels of man working in construction and shipbuilding before, during, and subsequent to World War II were at the same levels of exposure as is a worker engaged in similar activities today. This hypothesis is not true. The types of materials have changed, the percentage of asbestos contained in thermal insulation products has been reduced, the method of installation has changed, and fabrication equipment has changed. Each of these changes since the early 1940's has contributed in the reduction of dust levels. It is, therefore, illogical to compare disease occurrences which resulted from exposure from 20-30 years ago with dust levels monitored on construction sites within the last several years. It is also illogical to

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compare our American industry with that of foreign countries.

As I said, we have withstood the change from 5 millio particles per cubic foot of air to 12 fibres based on insufficient information gathered from small segments of the industry. Although there was no further input of pertinent information, again, based on supposition and assumption, the level was then reduced from 12 fibres to 5 fibres. Now, still based on supposition and assumption, with no further information available both NIOSH and the Asbestos Advisory Committee are recommending a reduction to 2 fibres. While these reductions in the Threshold Limit Value have been readily forthcoming, the proposed regulations, NIOSH Criteria Package, and the Asbestos Advisory Committee recommendations are completely void of any references to prohibiting or restricting workers who are habitual cigarette smokers from working with products containing asbestos fibre. The same studies, upon which much of the emphasis has been placed concerning the reduction of the Threshold Limit Value, also demonstrate drastic effects of cigarette smoking when associated with the pulmonary disease, Asbestosis.

As I told you, we have not achieved the level of 5 fibres. We are making a decided effort to do this. We have problems unique to the construction industry in attempting to comply with the proposed asbestos standards. I am not at this time going to review all of the minute problems involved in the application of these standards; instead, I am going to speak

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to the economics of achieving this proposed standard of 5 fibres per milliliter 5 microns and greater in length, as published in the Federal Register January 12, 1972. We feel, with the economic impact that this regulation will have on the Federal Office of Budget Management, other Federal agencies, including the Armed Services, and on private enterprise, it is worthy of very careful consideration by the Federal Department of Labor.

We brought together a number of the foremost contractors in the Thermal Mechanical Insulation Industry, and together we evaluated the cost of complying with the proposed asbestos regulation. This was accomplished by breaking down the regulation into each of its requirements and computing them individually. The requirements were computed individually, included monitoring, based on purchasing the monitoring equipment and having the samples analyzed at a private laboratory; respirators of the disposable type; physical examinations; dust collection and vacuum cleaning equipment; warning signs; protective clothing; and work placement. As a base we used a 100-man contracting unit with 25% of the unit working with asbestos-containing products. We computed off-job time and lost time productivity at an average construction worker's rate. The total cost for implementing a program to comply with the proposed Asbestos Dust Regulations as published in the January 12, 1972 Federal Register for a 100-man construct-

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ion unit, 25% of which worked with asbestos-containing materials, is $795,375.00 direct expenses per year - - $27,740.00 administrative expenses per year and $16,700.00 of capital expenses; therefore, a total for the 100-man unit, with 25% engaged in work with asbestos-containing products, amounts to $339,815.00 increased construction expense for the purpose of complying with the proposed Asbestos Dust Regulation. This represents an increased labor cost of 168% that must be passed on to the customer in order for a contractor to survive. The customer, in many instances, is the Federal Government and the Office of Budget Management. Considering the inadequacy of medical and scientific research information concerning safe exposure levels of asbestos dust, and also considering the supposition and assumption on which the proposed Threshold Limit Value is based, it is difficult to imagine a justification for the economic stress this regulation will place upon the construction industry, Federal Government, and private enterprise.

We respectfully urge the Secretary of Labor to:

1. Reinstate the Threshold Limit Value for Asbestos Dust at 12 fibres per milliliter 5 microns or greater in length, for an interim period.

2. To initiate a comprehensive epidemiological study of the entire asbestos industry as it exists in the United States; and to determine not only the effects of asbestos but

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also asbestos associated with other airborne contaminants and cigarette smoking.

3. To provide adequate lead time prior to the effective date of reduction of any Threshold Limit Value in order that the construction industry, operating on fixed contracts, can cope economically with the increased costs that such a reduction will create.

4. To provide definitive information concerning the specific requirements of the regulations.

5. Provide our trade associations with representation on future Study and Advisory Committees.

We, representing the construction industry, have been moving forward to provide safety and health information and implement safer working conditions. We intend to continue and accelerate this program. It is our desire to provide every possible protection for our people.

Thank you for the opportunity of appearing at this public hearing today.

I might add that the two trade associations I am representing here today made two requests for representation on the Advisory Committee, both of which were rejected. We, representing the construction industry, agree with Dr. Cooper's statement that there is a serious problem there. We have been moving forward to provide and enact voluntary safety and health procedural standards and implement safer working con-

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ditions. We have produced manuals. We have produced recently a Letter of Compliance and recommended procedures for compliance with the Emergency Standards. We have held meetings of all thermal mechanical association contractors throughout the country for two consecutive years solely on this point. We intend to continue and to accelerate this program.

It is our desire, as it is your desire, to provide every possible protection for our people; but let us not do it at the expense of the job opportunities of small businessmen and the economic impact on this industry.

Again, I wish to thank you very much for the opportunity of appearing here before you today.

EXAMINER GOLDBERG: Mr. Royer?

MR. ROYER: Mr. Goldberg and members of the Advisory Committee on Asbestos Standards, my name is J. Spencer Royer, and I am here to represent the National Insulation Contractors Association and approximately 1,000 small insulation contractors and fabricators around the country. I am President of the Young Sales Corporation with headquarters in St. Louis, Missouri. My company engages in the fabrication and application of thermal insulation and other materials which contain asbestos fiber. This includes hot and cold piping, equipment and duct work in commercial and industrial buildings, power plants, chemical plants, oil refineries, ships and a wide range of projects funded by the Federal Government. I'm

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no neophyte in this business, having been in it for 27 years. I am close to my employees. I know most of them by their first names. I am definitely interested in their health and welfare.

The statement has been made here that all risk in handling asbestos-containing material should be removed and the tolerance of air-laid fibers reduced to zero. The Advisory Committee has recommended a maximum of 2 fibers per milliliter of air. I am not sure I know exactly what that means as a contractor, but from the description I doubt seriously that it can be reached.

In fact, I say to you that to accomplish these goals on a construction job is impossible, and if this becomes the law either we will be out of business as contractors, or some other substitute materials must be found by the manufacturers to take the place of the asbestos.

Let me present a picture to you gentlemen which I'm sure you haven't considered.

Insulation contracting in the United States is approximately a $700,000,000 per year business: however, the average contractor is a small businessman with annual sales of approximately $700,000. Net profit after taxes averages 2% of the sales, or $14,000 per contractor per year.

Using figures developed by a number of other contractors from various parts of the country and myself, we computed that the additional cost resulting from the proposed asbestos

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dust standards will amount to $134,000 per average-sized contractor per year, or more than 10 times his net earnings.

It is obvious to me that unless the proposed Standard is modified in a major way or the cost is passed on to the customer which, in many cases is a Federally funded project, it will be impossible for the small insulation contractor to survive.

You must be made aware, also, that every contractor has a backlog of uncompleted work at a fixed price with specific material and specifications. It will be impossible, in most instances, to pass this added cost on to the customer, since these contracts were consummated prior to publication of the proposed regulation.

I had intended to go into the breakdown of the different items, but just briefly we broke down, item by item your proposed regulation:

1. Monitoring
2. Physical examinations
3. Worker placement
4. Respirators
5. Dust collectors,
6. Vacuum cleaning
7. Warning signs
8. Protective clothing

By using these, item by item, we computed what it

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would cost the average contractor. As best we can find out, he employes somewhere between sixteen and twenty men. So you can see that each contractor has a small contingent of the overall business.

One item in particular is the monitoring. We based our projected cost on approximately one sampling unit for each three men employed. We estimated laboratory expense on the basis of two samples per day per employee. In addition, we included administration expense to perform the monitoring, take samples to the laboratory and handle the respirator program.

This may sound ridiculous, but because of the mobilit and the geography involved in the construction job - - it isn't like a plant where you can monitor locations day after day without any problems and establish what the limits are there. You have to follow this man around, because he is movin all over the project.

In addition, we included administration expense to perform the monitoring.

By the way, at the moment we know of only two private labs in the United States that are equipped and competent to perform the analysis of the samples.

The time that will be lost on the job, both in executing the tests and in trying to carry out the stipulations of the regulation as proposed is staggering. We estimate our labor cost for materials will be increased 168%.

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The main issue, so far as the contractor is concerned, is how he will be able to pay these additional costs and still remain in business. In my opinion, many of them won't be able to absorb it.

We urge you to reconsider the proposed Asbestos Dust Standard as published in the Federal Register on January 12, 1972.

We, as contractors, are just as interested as you in seeing that our employees work under safe conditions, but we request that further investigation and evaluation be made to initiate more practical standards that will provide protection to our people but that will not put us out of business.

Thank you.

(Discussion off the record.)

EXAMINER GOLDBERG: Mr. Zumwalt?

Mr. ZUMWALT: Mr. Examiner, my name is Charles Zumwalt, and I am the Secretary-Treasurer of the Industrial Safety Equipment Association. This is the trade association of the principle manufacturers of all forms of personal protective equipment except shoes. Included among our members are the manufacturers of protective devices on whose behalf I speak to you today. We have previously submitted our comments in writing pertaining to the proposal containing the Federal Register of January 12. Presumably they will be entered into the record, and I have given copies to the stenotype recorder for her use.

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This sub-paragraph (6) we do not agree against the type set positive pressure respirators as protection for concentration exceeding 500 times the limit. We do dispute limitation to only continuous flow-types. There are many industrial applications where the distance from sources of respirable air exceed the present limitation of 250 feet of hose and the protocol 300 feet of hose. This is particularly true in work alterations in confined spaces such as holds of ships and the like. Such situations often preclude the use of compressors and require tank systems as the source of respirable air.

Unless demand-type airline respirators are utilized in such tank systems, workers run the risk of exhausting tank contents prematurely and without adequate safeguards due to the waste of aeronate continuous flow-type system. Inasmuch as positive pressure is maintained in the facepiece at all times, use of equipment acts to serve the exhaustible supply.

We suggest appropriate rewording.

As a final word, we stress the need for the asbestos standards to recognize self-contained breathing apparatus, both open and closed circuit types, as an allowable form of protective system in all concentrations.

In closing, we applaud the drafters of the recommendations contained in the Advisory Committee's Report. Such suggestions as we have made are born of the desire to see the fulfillment of their primary objectives.

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With your permission I shall refrain from repeating these comments now. More importantly, however, I should like to address our members' comments to the more formal presentations which form the report of the Advisory Committee and significantly enlarge upon the January 12 concept. The report by our respiratory manufacturers does not warrant our comment as experts upon any facets of the Committee's reports except their recommendations contained in 1910.93, Paragraph NC, Respiratory Protective Devices. We would like to underscore the preamble paragraph approved (30CFR-11) shall be selected.

The statements shown in sub-parts (5), (6), and (7) are sound in our opinion, and we do not fault their test.

Sub-parts (1) and (3), which treat [illegible] in concentrations of five times the limit in two and ten times the limit (3) are, in our considered opinion, arbitrary.

We submit this document states identical performance criteria for both valveless and valve disposal-type dust respiratory devices. Why, then, the express limitations of five times the limit and ten times the limit for two types required to meet identical performance? This is specific opinion in our judgment, and not facts.

We recommend and state that until different criteria are to be made for valveless versus valve devices, the selection must be on a good or no-good basis, with a concentration limit decided upon.

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We often find the future success of any Advisory Committee dealing with respiratory devices in general or specific reference could well benefit from the input of the considerable expertise of the manufacturers.

SAWYER SOLBERG: Thank you, Mr. Zumwalt.

For this afternoon it would appear there will be only three witnesses. Accordingly, if there are those have scheduled to appear tomorrow or Friday who would want to go on after the three witnesses, then I will consider you this afternoon.

We will stand in recess until two o'clock.

(Whereupon, at 12:45 the hearing was recessed, to reconvene at 2:00 p.m., this same day.)

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GC-1-105
MAY 1965

U.S DEPARTMENT OF LABOR

Washington

PLAINTIFF'S EXHIBIT 14 10-12-78

RECORDS AUTHENTICATION CERTIFICATE

I HEREBY ATTEST, That the annexed copy, or each of the specified number of copies, of each document listed below is a true copy of a document in the official custody of the Department of Labor.

1 copy each of:
Transcripts from March 14,15,16, and 17
Comments and hearing exhibits of:
W.J. Nicholson, American Petroleum Institute, D.A. Holaday, Brand Insulations Inc., L.J. Bibri, B.J. Phillips(Certain-teed), M.W. Borow, J.D. Moran(Flintkote), F.L. Pundsack(J-M), J.W. Rawlings, W.M. Hancock(Dow), W.K. Hesse(J-M), E.M. Fenner(J-M), E.J. Killian(Nat. Cypsum), Cement Asbestos Products Co., M.M. Key, G.E. Best(MCA)

SIGNATURE AND OFFICIAL TITLE	DIVISION AND BUREAU	DATE
Daniel J. Marsick Technical Information Specialist	Docket Office/Technical Data Center/Occup. Sfty & Hlth Adm/ U.S. Dept. of Labor	7 Sep 78

I HEREBY CERTIFY, That Daniel J. Marsick who signed the foregoing attestation, is now and was at the time of signing (title) Technical Information Specialist and has legal custody of the official records of the United States Department of Labor therein attested and that full faith and credit should be given to his act as such.

IN WITNESS WHEREOF, I

J. J. Lafranchise

duly designated by the Secretary of Labor as Authentication Officer of the Department of Labor, have hereunto subscribed my name and caused the seal of the Department of Labor to be affixed this 7th day of September 1978.

J. J. Lafranchise

Authentication Officer
Department of Labor

186.

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