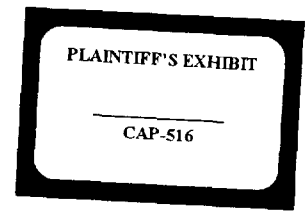

ASBESTOS INDUSTRY RESPONSE
NOTICE OF PROPOSED RULEMAKING
OCCUPATIONAL EXPOSURE TO ASBESTOS 29 CFR PART 1910
FEDERAL REGULATION VOL. 40 NO. 197, 9 OCTOBER, 1975

DETAILED COMMENTS CONCERNING PROPOSED REGULATION

(Provisions for which no comments are offered are omitted)

1. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(a) SCOPE AND APPLICATION This section applies to every place of employment where asbestos or a product containing asbestos is manufactured, processed, packaged, stored, applied, used or otherwise handled. However, this section does not apply to construction work within the scope of Section 1910.12 of this part nor to working conditions of employees with respect to which other Federal agencies exercise statutory authority to prescribe or enforce standards or regulations affecting occupational safety or health.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(a) SCOPE AND APPLICATION This section applies to every fixed place of employment where asbestos or a product containing asbestos is manufactured, processed, packaged, stored, applied, used or otherwise handled. However, this section does not apply to construction work within the scope of Section 1910.12 of this part nor to working conditions of employees with respect to which other Federal agencies exercise statutory authority to prescribe or enforce standards or regulations affecting occupational safety or health.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

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REASONS

Use of the phrase "fixed place of employment" excludes from coverage of the section both transportation of asbestos and asbestos containing

REASONS (continued)

products and activities performed in the field, whether defined as construction or not. The language is consistent with the sentence which follows and makes it possible easily and quickly to ascertain whether or not the regulation applies to many ordinary work situations, without any need for reference to other laws and regulations. It is suggested that regulations to be promulgated for the construction industry be written to cover all non-fixed places of employment since problems of compliance in all such places should be similar.

2. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(b) DEFINITIONS For the purpose of this section -

(1) "Asbestos" includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite, and every product containing any of these minerals.

(2) "Asbestos fiber" means a particulate form of asbestos longer than 5 micrometers, with a length-to-diameter ratio of at least 3 to 1, and with a maximum diameter of 5 micrometers.

(3) "Emergency" means an unforeseeable and unexpected occurrence likely to release airborne concentrations of asbestos fibers in excess of 5 fibers per cubic centimeter of air, such as, but not limited to, failure of equipment or control devices, and rupture of containers.

(4) "Authorized person" means * * * *

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(b) DEFINITIONS For the purpose of this section -

(1) "Asbestos" includes chrysotile, amosite and crocidolite, and members of the tremolite, anthophyllite and actinolite mineral group when they occur in fibrous habit (and every product containing any of these minerals).

(2) "Asbestos fiber" means a particulate form of asbestos longer than 5 micrometers, with a length-to-diameter ratio of at least 5 to 1, and with a maximum diameter of 5 micrometers.

(3) "Emergency" means an unforeseeable and unexpected occurrence that (likely to) releases airborne concentrations of asbestos fibers in excess of (5) 10 fibers per cubic centimeter of air, such as, but not limited to, failure of equipment or control devices, and rupture of containers.

(4) "Feasible" means feasible in both the technological and economic sense.

RECOMMENDED CHANGES (continued)

(5) "Authorized person" means * * * * *

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(b) DEFINITIONS For the purpose of this section -

(1) "Asbestos" includes chrysotile, amosite and crocidolite, and members of the anthophyllite, tremolite and actinolite mineral group when they occur in fibrous habit.

(2) "Asbestos fiber" means a particulate form of asbestos, longer than 5 micrometers, with a length to diameter ratio of at least 5 to 1, and with a maximum diameter of 5 micrometers.

(3) "Emergency" means an unforeseeable and unexpected occurrence that releases airborne concentrations of asbestos fibers in excess of 10 fibers per cubic centimeter of air, such as, but not limited to, failure of equipment or control devices, and rupture of containers.

(4) "Feasible" means feasible in both the technological and economic sense.

(5) "Authorized person" means * * * * *

REASONS

Although mineralogical definitions usually apply to rather broad classes of mineral materials and therefore, typically, are imprecise; the words "chrysotile", "amosite" and "crocidolite" generally are understood to describe minerals which clearly are separable into discrete fibers. On the other hand, the words "anthophyllite", "tremolite" and "actinolite" cover a wide range of minerals, both fibrous and non-fibrous. A failure to distinguish between the fibrous and non-fibrous forms might bring under the proposed regulation a number of work places

REASONS (continued)

where there are no health hazards of the kind which the regulation seeks to control.

Deletion of the words "and every product containing any of these minerals" from the definition of "asbestos" brings the regulatory definition into accord with customary trade and industry parlance and avoids the possibility of confusion and misunderstanding. Asbestos containing products and materials are made subject to the regulation by the wording of paragraph (a) "Scope and Application".

Changing the aspect ratio in the definition of "asbestos fiber" from "3 to 1" to "5 to 1" will exclude from coverage of the regulation particles which truly are not fibrous in nature and which widely are believed to have no biological effect. The change also will make the regulatory definition concur with the definition currently being developed by ASTM Committee E-34.

In the definition of "emergency" the words " that releases * * * asbestos fibers" are substituted for the words "likely to release * * * asbestos fibers", because it seems more practical to require the initiation of emergency procedures by operating personnel upon the occurrence of a specific and easily identifiable event than upon the development of a speculative or hypothetical situation.

The number "10" is substituted for the number "5" to make that definition consistent with changes proposed in paragraph (c) "Permissable Exposure to Airborne Concentrations of Asbestos Fibers" and with similar changes proposed elsewhere.

REASONS (continued)

"Feasibility" is defined to clarify the meaning of the word; to bring the concept into conformity with recent judicial decisions, and to provide definitional support, on economic feasibility grounds, for the use, by small and intermittent users of asbestos and asbestos containing products, of personal protection as the primary method of compliance with the regulation.

3. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(c) PERMISSABLE EXPOSURE TO AIRBORNE CONCENTRATIONS OF ASBESTOS FIBERS -

(1) 8 HOUR TIME-WEIGHTED AVERAGE CONCENTRATION No employee may be exposed to an 8 hour time-weighted average airborne concentration of asbestos fibers in excess of 0.5 fibers per cubic centimeter (or 500,000 fibers per cubic meter) of air, as determined on the basis of a 40 hour work week and by the method prescribed in paragraph (e) (3) of this section.

(2) CEILING CONCENTRATION No employee may be exposed to airborne concentrations of asbestos fibers in excess of 5 fibers per cubic centimeter (or 5 million fibers per cubic meter) of air, as determined over a period up to 15 minutes, by the method prescribed in paragraph (e) (3) of this section.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(c) PERMISSABLE EXPOSURE TO AIRBORNE CONCENTRATIONS OF ASBESTOS FIBERS -

(1) 8 HOUR TIME-WEIGHTED AVERAGE CONCENTRATION No employee may be exposed to an 8 hour time-weighted average airborne concentration of asbestos fibers in excess of (0.5 fibers) 2 fibers per cubic centimeter ((or 500,000 fibers per cubic meter)) of air, as determined (on the basis of a 40 hour work week and) by the method prescribed in paragraph (e) (3) of this section.

(2) CEILING CONCENTRATION No employee may be exposed to airborne concentrations of asbestos fibers in excess of (5) 10 fibers per cubic centimeter ((or 5 million fibers per cubic meter)), of air, as determined over a 15 minute sampling period (up to 15 minutes), by the method prescribed in paragraph (e) (3) of this section.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(c) PERMISSABLE EXPOSURE TO AIRBORNE CONCENTRATIONS OF ASBESTOS FIBERS -

(1) 8 HOUR TIME-WEIGHTED AVERAGE CONCENTRATION No employee may be exposed to an 8 hour time-weighted average airborne concentration of asbestos fibers in excess of 2 fibers per cubic centimeter of air, as determined by the method prescribed in paragraph (e) (3) of this section.

(2) CEILING CONCENTRATION No employee may be exposed to airborne concentrations of asbestos fibers in excess of 10 fibers per cubic centimeter of air, as determined over a 15 minute sampling period by the method prescribed in paragraph (e) (3) of this section.

REASONS

A 2 fiber TWA standard is proposed in lieu of the OSHA proposed 0.5 fiber standard for the following reasons:

1. Credible scientific studies concerning asbestos and health - published since 1972, when OSHA adopted a 2 fiber permanent standard, do not support the contention that protection of the health of employees in industry requires a reduction of permissable exposure levels from 2 fibers per cc to 0.5 fibers per cc.

2. When industry has proceeded in good faith with substantial capital expenditures, work practice changes and employee training in the belief that the permanent exposure standard would be 2 fibers per cc; a reduction in that standard by a factor of 75% is grossly inequitable and violates the concept of due process, if there is no clear and unequivocal new scientific evidence to support the change.

REASONS (continued)

3. In the absence of clear scientific justification for the change, a reduction in the exposure standard below 2 fibers per cc would impose an unreasonable and unwarranted burden upon small enterprises, particularly in the secondary and end user categories.

4. In the light of the present state of the dust monitoring art, an exposure standard of less than 2 fibers per cc would be per se inequitable and impossible or impractical to enforce because of the inherent inaccuracies of the membrane filter test method at fiber concentrations less than 2 per cc.

The conversion of the mandated standard, in the text of the regulation, to an equivalent number of fibers per cubic meter is unnecessary, redundant, and confusing.

The words "as determined on the basis of a 40 hour work week" in sub-paragraph (1) are confusing, obscure of meaning, may be interpreted to require complicated dust count calculations, and may imply a mandate for difficult or unworkable compliance procedures. It is suggested that they be deleted. If, by the proposed wording, it is intended that an employee who works more than 40 hours in one week shall be exposed to a TWA level of airborne asbestos which is no more than a calculated fraction of the permissable exposure standard, so that that reduced level multiplied by the hours which he actually works does not exceed the standard multiplied by 40, while an employee who works less than 40 hours in one week may be exposed to a TWA level of airborne asbestos greater than the mandated standard;

REASONS (continued)

the provision will create many problems. Its implementation would require foreknowledge of the need to work overtime (and employers often do not have advance indications of prospective overtime situations), a detailed perception of the daily exposure of each employee, and the freedom, often limited by collective bargaining agreements, either arbitrarily to reassign employees to different work stations, deny them overtime work or require their extended use of respirators. The medical evidence does not oblige OSHA or the asbestos industry to embrace such a difficult regulatory endeavor. Those epidemiological studies which have alerted government, industry and the public to the health hazards of occupational exposures to asbestos all have been performed upon typical or average working populations, populations in which individuals have both worked overtime and also have enjoyed vacations and holidays, have experienced lay-offs and otherwise have encountered short work-weeks. It may, therefore, be concluded from these studies that an exposure level of 2 fibers per cc. TWA provides adequate protection for employees in such normally variable work situations, situations which will include work-weeks of both more and less than 40 hours.

A 10 fiber ceiling is proposed in lieu of the OSHA proposed 5 fiber ceiling for the following reasons:

1. Credible scientific studies concerning asbestos and health published since 1972, when OSHA adopted a 10 fiber permanent ceiling, do not support the contention that protection of the health of employees in industry requires a reduction of ceiling levels from 10

REASONS (continued)

fibers per cc to 5 fiber cc.

2. When industry has proceeded in good faith with substantial capital expenditures, work practice changes and employee training while believing that the permanent ceiling would be 10 fibers per cc; a reduction in that ceiling by a factor of 50% is grossly inequitable and violates the concept of due process, if there is no clear and unequivocal new scientific evidence to support the change.

3. In the absence of clear scientific justification for the change, a reduction in the permanent ceiling below 10 fibers per cc. would impose an unreasonable and unwarranted burden upon small enterprises, particularly in the secondary and consumer categories.

The conversion of the mandated ceiling, in the text of the regulation, to an equivalent number of fibers per cubic meter is unnecessary, redundant and confusing.

For ceiling concentration determinations a sampling period of 15 minutes is recommended to achieve statistical accuracy of plus or minus 10% at the 10 fiber level. At a lower mandated fiber level the sampling time would have to be extended to assure comparable accuracy.

There appears to be no satisfactory solution to the problem of measuring ceiling fiber concentrations in the presence of a mixed dust which may blind the filter.

REASONS (continued)

If a range of sampling times is permitted (i.e., from 0-15 minutes as proposed), the chances of encountering discrepancies between tests taken at the same station become multiplied and needless additional compliance and enforcement problems will result. A single, specified time period (15 minutes is suggested) avoids confusion and uncertainty.

4. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(d) REGULATED AREAS Any work area where a person may be exposed to airborne concentrations of asbestos fibers in excess of either of the limits imposed by paragraph (c) of this section shall be designated a regulated area. Only authorized persons may be allowed to enter such an area. A daily roster of all persons entering a regulated area shall be made and maintained.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(d) REGULATED AREAS Any work area where (a person may be exposed to) airborne concentrations of asbestos fibers regularly are in excess of either of the limits imposed by paragraph (c) of this section shall be designated a regulated area. Only authorized persons may be allowed to enter such an area. (A daily roster of all persons entering a regulated area shall be made and maintained).

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(d) REGULATED AREAS Any work area where airborne concentrations of asbestos fibers regularly are in excess of either of the limits imposed by paragraph (c) of this section shall be designated a regulated area. Only authorized persons may be allowed to enter such an area.

REASONS

To define a regulated area as a "work area where a person may be exposed to airborne concentrations of asbestos fibers in excess of either of the limits" is to make the concept almost meaningless. There will be few places in any facility handling asbestos or products containing asbestos where some combination of circumstances might not create a brief exposure to airborne fiber concentrations above the mandated limits. The considerable burdens of creating and maintaining

REASONS (continued)

regulated areas should be confined to those situations in which there is a real possibility of excess exposure. We recommend that a regulated area be defined as an area in which airborne concentrations of asbestos fibers "regularly are in excess of either of the limits" prescribed.

We also recommend that no roster of persons entering a regulated area be required.

If the purpose of a daily roster of persons entering a regulated area is to permit the development of an individual exposure history for use in subsequent diagnosis and treatment, the record is unnecessary. Payroll records will indicate individuals regularly assigned to work in a regulated area. Information concerning occasional or intermittent visits by other authorized persons will be of no value, because it will not be possible to correlate such information with fluctuating and differing exposure levels at various times and locations within the regulated area. If the purpose of a daily roster of persons entering a regulated area is simply to remind management and other employees that unauthorized personnal are to be excluded; the record is a cumbersome, unreasonable and expensive means of achieving a simple objective.

5. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(e) MONITORING The purpose of all monitoring required by this paragraph is to measure accurately the airborne concentrations of asbestos fibers in a workplace to which employees would be exposed if they worked in the area without the use of personal protective equipment, such as respirators. Monitoring shall be performed in a manner reasonably calculated to satisfy this purpose. It may not be necessary to monitor every employee exposed to airborne concentrations of asbestos fibers in order to satisfy the purposes of this paragraph. For instance, the employee, or his working locations, likely to be exposed to the highest airborne concentration of asbestos fibers in a work area may be deemed a representative of all the employees in the area. An employee in one shift may be deemed a representative of all employees in other shifts who, because they perform the same operation or are stationery in the same area, or for other relevant reasons, may reasonably be considered to have the same level of exposure as the representative employee. However, the results of a monitoring of a representative employee shall be deemed to apply, and to indicate the exposure level of all employees represented.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(e) MONITORING The purpose of all monitoring required by this paragraph is to measure (accurately) whether or not the airborne concentration(s) of asbestos fibers in a workplace to which employees would be exposed if they worked in the area without the use of personal protective equipment, such as respirators, exceeds either of the permissable exposure limits specified in paragraph (c) of this section. Monitoring shall be performed in a manner reasonably calculated to satisfy this purpose. It may not be necessary to monitor every employee exposed to airborne concentrations of asbestos fibers in order to satisfy the purposes of this paragraph. For instance, the employee, or his working locations, likely to be exposed to the highest airborne concentration of asbestos fibers in a work area may be deemed a representative of all the employees in the area. An employee (in) on one shift may be deemed a representative of all employees (in) on other shifts who, because they perform the same operation or are stationary in the same area, or for other relevant reasons, may reasonably be considered to have the same level of exposure as the representative employee. However, the results of a monitoring of a representative employee shall be deemed to apply to, and to indicate the exposure level of, all employees represented. Similarly, it may not be necessary

RECOMMENDED CHANGES (continued)

continuously to monitor an employee for an 8 hour period. An employee may be monitored for any lesser period of time, properly representative of his 8 hour exposure to airborne concentrations of asbestos fibers.

NOTE: Phrases in parenthesis are delections.
Phrases underlined are additions.

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SECTION 1910.1001 ASBESTOS

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REASONS

No informed person would maintain that the mandated membrane filter monitoring method measures airborne fiber concentrations accurately, and it is misleading to the uninformed to state in a Federal regulation that the technique is accurate.

REASONS (continued)

The purpose of monitoring is simply to establish and verify the continuation of conditions necessary for compliance with exposure limits, and the regulation should so indicate.

One company has reported that an OSHA compliance officer has insisted that the monitoring of an employee, to be valid, must be continued for a full eight hours. Language has been added to the end of this sub-paragraph to validate the widely accepted procedure of using a shorter, representative sampling period to measure exposure during a full 8 hour shift.

6. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(e) MONITORING * * * * *

(1) INITIAL Every employer shall cause every place of employment where asbestos fibers may be released to be monitored in such a manner as to determine whether employees are exposed to concentrations of asbestos fibers in excess of either of the two limits prescribed in paragraph (c) of this section. If either limit is exceeded, the employer shall immediately undertake a compliance program in accordance with paragraph (f) of this section.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(e) MONITORING * * * * *

(1) INITIAL Every employer to which this section applies shall (cause every place of employment where asbestos fibers may be released to be monitored in such a manner as to determine whether employees are exposed to concentrations of asbestos fibers) make an initial determination as to whether or not, at any place of employment under his control, under any reasonably foreseeable conditions, airborne asbestos fiber concentrations in excess of either of the (two) exposure limits prescribed in paragraph (c) of this section, are likely to be generated. If, for any place of employment information sufficient to make a reliable initial determination is not available or if the determination indicates a reasonably foreseeable possibility of exposure over either limit, that place of employment then shall be monitored to determine whether or not employees, in fact, are so exposed. If either limit is exceeded, the employer immediately shall undertake a compliance program in accordance with paragraph (f) of this section.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(e) MONITORING * * * * *

(1) INITIAL Every employer to which this section applies shall make an initial determination as to whether or not, at any place of employment under his control, under any reasonably foreseeable con-

INDUSTRY PROPOSAL (continued)

ditions, airborne asbestos fiber concentrations in excess of either of the exposure limits prescribed in paragraph (c) of this section are likely to be generated. If, for any place of employment, information sufficient to make a reliable initial determination is not available or if the determination indicates a reasonably foreseeable possibility of exposure over either limit, that place of employment then shall be monitored to determine whether or not employees, in fact, are so exposed. If either limit is exceeded, the employer immediately shall undertake a compliance program in accordance with paragraph (f) of this section.

REASONS

Since there are few, if any, places of employment at which asbestos or asbestos containing materials (i.e., gasketing, friction materials, electrical insulation, building materials, etc.) are not present, and since any asbestos containing material under some conceivable condition of use or abuse might release an asbestos fiber; both the present regulation and the OSHA proposal would appear to require initial monitoring at virtually every place of employment in the United States. Surely such a burdensome and wasteful undertaking goes byond the intent of the Occupational Safety and Health Act. The purpose of the statute is to assure a reasonably safe and healthful workplace. That objective can be achieved by monitoring only those places of employment which credibly might violate the exposure limits.

There are many work situations involving the use or handling of asbestos or asbestos containing materials which could not, under any normal circumstances, release airborne concentrations of asbestos fibers in excess of 2 fibers per cc. Examples might be: the handling, storage, installation or application of bonded asbestos materials involving no cutting, sanding, sawing, drilling or other abrasive

REASONS (continued)

treatment; the handling, conveyance, forming or application of asbestos fibers in a resin or other adhesive matrix; and the storage, pumping, transport or forming of asbestos fibers in slurry form. A rational application of the regulation, particularly among small or intermittent users of asbestos materials, should permit the conscientious employer to reach an ad hoc conclusion that expensive and inconvenient monitoring need not be performed at a particular place of employment.

7. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(e) MONITORING * * * * *

(2) FREQUENCY (i) If monitoring shows than an employee's exposure is above either limit prescribed in paragraph (c) of this section, the monitoring shall be repeated every month, except as otherwise provided in paragraph (e) (2) (ii) of this section.

(ii) If monitoring shows than an employee's exposure is below both limits prescribed in paragraph (c) of this section, the monitoring shall be repeated every three months, except as otherwise provided in paragraph (e) (2) (i) or (e) (2) (iii) or (e) (2) (iv) of this section.

(iii) If two consecutive monitorings made at least 5 days, but not more than 3 months apart, show than an employee's exposure is below both limits prescribed in paragraph (c) of this section, monitoring need not be repeated, except as otherwise provided in paragraph (e) (2) (iv) of this section.

(iv) Whenever an employer has reason to believe that an employee's level of exposure has changed because of a change in production, process, controls, or other relevant factors, the employee shall be monitored as soon as practicable, and thereafter paragraphs (e) (2) (i), (e) (2) (ii) or (e) (2) (iii) shall apply.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(e) MONITORING * * * * *

(2) FREQUENCY (i) If monitoring shows that an employee's exposure is above either limit prescribed in paragraph (c) of this section; (the) monitoring thereafter shall be repeated (every month) as often as necessary (except as otherwise provided in paragraph (e) (2) (ii) of this section) to verify any reductions in airborne fiber concentrations to be expected from implementation of a compliance program adopted under paragraph (f) if this section but no less frequently than once each 6 months.

((ii) If monitoring shows that an employee's exposure is below both limits prescribed in paragraph (c) of this section, the monitoring shall be repeated every three months, except as otherwise provided in paragraph (e) (2) (i) or (e) (2) (iii) or (e) (2) (iv) of this section).

RECOMMENDED CHANGES (continued)

((iii)) (ii) If two consecutive monitorings made at least 5 days but not more than (3) 6 months apart, show that an employee's exposure is below both limits prescribed in paragraph (c) of this section; monitoring need not be repeated, except as otherwise provided in paragraph (e) (2) ((iv)) (iii) of this section

((iv)) (iii) Whenever an employer has reason to believe that an employee's level of exposure has (changed) increased because of a change in production, process, controls, or other relevant factors, the employee shall be monitored as soon as practicable, and thereafter paragraphs (e) (2) (i) or (e) (2) (ii) (or (e) (2) (iii)) shall apply.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(e) MONITORING * * * * *

(e) FREQUENCY (i) If monitoring shows than an employee's exposure is above either limit prescribed in paragraph (c) of this section; monitoring thereafter shall be repeated as often as necessary to verify any reductions in airborne fiber concentrations to be expected from implementation of a compliance program adopted under paragraph (f) of this section but no less frequently than once each 6 months.

(ii) If two consecutive monitorings made at least 5 days, but not more than 6 months apart, show than an employee's exposure is below both limits prescribed in paragraph (c) of this section, monitoring need not be repeated, except as otherwise provided in paragraph (e) (2) (iii) of this section.

(iii) Whenever an employer has reason to believe that an employee's level of exposure has increased because of a change in production, process, controls, or other relevant factors, the employee shall be monitored as soon as practicable, and thereafter paragraphs (e) (2) (i) or (e) (2) (ii) shall apply.

REASONS

Even though an employee's exposure may be above prescribed limits, it is unnecessarily burdensome and expensive to require frequent

REASONS (continued)

repetitions of the monitoring procedure, unless there is reason to believe that conditions have changed. If work practice changes have been made or equipment installed under a compliance program, the employer will be motivated to monitor as a measure of his progress. If the employer has reason to believe that conditions have deteriorated, he is obliged by sub-paragraph (iii) promptly to repeat the monitoring procedure. In any situation in which a work place is over prescribed exposure limits, a repetition of the monitoring procedure every 6 months should be sufficient to assure that airborne concentrations of fibers are not unaccountably rising and to assure that small businesses are not generating airborne concentrations of fibers in excess of levels at which they can use personal protection as the primary mode of compliance.

Since an employer who receives a monitoring report that a work place is below the mandated exposure levels, will wish promptly to repeat the test so that he may be excused from the requirement of further monitoring, OSHA sub-paragraph (ii) is unnecessary and should be deleted.

Because outside laboratories often are slow to complete the microscopic examination of dust samples, a delay of 6 months should be allowed between the first and second favorable sampling required to qualify for relief from the necessity for further monitoring.

An employer should not be required to monitor if he believes that

REASONS (continued)

a change in his operation has reduced airborne concentrations of asbestos fibers. If he believes that the reduction is great enough to bring a workplace below permissable exposure limits, he has ample incentive to perform the test.

8. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(e) MONITORING * * * * *

(4) EMPLOYEE NOTIFICATION

(i) Within five (5) working days after the receipt of the measurement results, the employer shall notify each employee in writing of the results concerning the employee's exposure.

(ii) Where the results reveal an employee's exposure to be above either of the permissable exposure limits, such notification shall also include a statement of the corrective action being taken to reduce exposure to or below the permissable exposure limits.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(e) MONITORING

(4) EMPLOYEE NOTIFICATION

(i) Within five (5) working days after receipt of (the) measurement results, the employer, in writing, shall notify (each) employees (in writing) found to be exposed to concentrations of airborne asbestos in excess of either of the permissable exposure limits (of the results concerning the employee's exposure) specified in paragraph (c) of this section. Notification may be by posting on a plant or departmental bulletin board. ((ii) Where the results reveal an employee's exposure to be above either of the permissable exposure limits, such) the notification shall (also) include a statement of the (corrective action being taken to reduce exposure to or below the permissable exposure limits) verification procedures to be undertaken or the method of compliance which the employer has elected to adopt under the provisions of paragraph (f) of this section.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(e) MONITORING

(4) EMPLOYEE NOTIFICATION

(i) Within five (5) working days after receipt of measurement results, the employer, in writing, shall notify employees found to be exposed to concentrations of airborne asbestos in excess of either of the permissable exposure limits specified in paragraph (c) of this section. Notification may be by posting on a plant or departmental bulletin board. The notification shall include a statement of the verification procedures to be undertaken or the method of compliance which the employer has elected to adopt under the provisions of paragraph (f) of this section.

REASONS

The purpose of the statute, protection of the health of employees, does not require that employees be notified if their exposure to airborne asbestos is below permissable limits. With bulletin boards so widely used in industry today, notices posted there are as effective as individual notices and are a less costly and less troublesome means of communication.

Because the membrane filter test method is so notoriously inaccurate, the first logical step to be taken following a result in excess of the standard, might be to take an additional reading or readings. Moreover, since the regulation recognizes that engineering controls may not always be feasible, the notice to employees cannot always include "a statement of the corrective action being taken to reduce exposure to or below the permissable exposure limits." To cover every case which may arise, the statement in the notice should describe "the verification procedures to be undertaken or the method of compliance which the

REASONS (continued)

employer has elected to adopt * * * * *". This change in wording would be particularly apt if, as hereinafter recommended, certain employers are to be permitted to use personal protection as their primary mode of compliance.

9. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE Employee exposure to asbestos fibers shall be controlled to or below the permissable exposure limits by engineering controls, work practices and personal protection controls.

1. ENGINEERING AND WORK PRACTICE CONTROLS Engineering controls shall be instituted immediately to reduce employee exposure to or below the permissable exposure limits, except to the extent that such controls are not feasible. Where engineering controls which can be instituted immediately are not sufficient to reduce exposure to or below the permissable exposure limits, they shall nonetheless be used to reduce exposure to the lowest practicable level, and shall be supplemented by the use of work practice controls.

2. PERSONAL PROTECTION CONTROLS Where engineering and work practice controls are not sufficient to reduce employee exposure to or below the permissable exposure limits, they shall nonetheless be used to reduce exposure to the lowest possible level, and shall be supplemented by the use of respirators, in accordance with paragraph (g) of this section.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE Employee exposure to airborne asbestos fibers shall be controlled to or below the permissable exposure limits by engineering controls, work practices and personal protection controls as follows:

1. ENGINEERING (AND) WORK PRACTICES AND PERSONAL PROTECTION CONTROLS Engineering and/or work practice controls shall be instituted immediately to reduce employee exposure to or below the permissable exposure limits, except to the extent that such controls are not feasible. (Where) Whereever feasible engineering and work practice controls which can be instituted immediately are not sufficient to reduce exposure to or below the permissable exposure limits; they shall nonetheless be used, except as hereinafter provided to reduce exposure to the lowest practicable level, and shall be supplemented by the use of (work practice controls) respiratory protection in accordance with paragraph (g) of this section.

(2. PERSONAL PROTECTION CONTROLS Where engineering and work practice controls are not sufficient to reduce employee exposure to or below the permissable exposure limits, they shall nonetheless be used to

RECOMMENDED CHANGES (continued)

reduce exposure to the lowest possibly level, and shall be supplemented by the use of respirators, in accordance with paragraph (g) of this section).

2. SMALL AND INTERMITTENT USERS Employers employing less than 25 persons who are exposed to asbestos or products containing asbestos, and employers in whose facilities asbestos or asbestos containing products are being used, handled, fabricated or installed in a manner which releases airborne asbestos fibers in excess of the permissable limits during less than an aggregate of 2 hours of each 8 hour shift, may make a reasonable determination that, for their operations, engineering controls are not feasible and may elect to use work practices and respiratory protection alone as their method of compliance, but respiratory protection may be used only in the manner and within the limitations described in paragraph (g) of this section.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE Employee exposure to airborne asbestos fibers shall be controlled to or below the permissable exposure limits by engineering controls, work practices, and personal protection controls as follows:

(1) ENGINEERING, WORK PRACTICES AND PERSONAL PROTECTION CONTROLS Engineering and/or work practice controls shall be instituted immediately to reduce employee exposure to or below the permissable exposure limits, except to the extent that such controls are not feasible. Wherever feasible engineering and work practice controls which can be instituted immediately are not sufficient to reduce exposure to or below the permissable exposure limits; they shall nonetheless be used, except as hereinafter provided, to reduce exposure to the lowest practicable level, and shall be supplemented by the use of respiratory protection in accordance with paragraph (g) of this section.

(2) SMALL AND INTERMITTENT USERS Employers employing less than 25 persons who are exposed to asbestos or products containing asbestos, and employers in whose facilities asbestos or asbestos containing products are being used, handled, fabricated or installed in a manner which releases airborne asbestos fibers in excess of the permissable limits during less than an aggregate of 2 hours of each 8 hour shift, may make a reasonable determination that, for their operations, engineering controls are not feasible and may elect to use work practices and respir-

(2) SMALL AND INTERMITTENT USERS (continued)

atory protection alone as their method of compliance, but respiratory protection may be used only in the manner and within the limitations described in paragraph (g) of this section.

REASONS

Although engineering controls have the virtue of being generally less subject to human failings than work practice controls, information received from our participating companies indicates that poor work practices can overwhelm the best engineering installation and typically can create more dangerous levels of exposure than do equipment failures. In most situations, engineering controls and work practices are most effective if used in combination. For this reason, we believe that work practices should be elevated in the regulation to a status co-equal with engineering controls.

Our survey data indicates that the cost of engineering controls does not decrease ratably as the capacity of the equipment is reduced. It also is apparent that dust exposure points in smaller manufacturing and repair facilities are less easily defined, because work is moved from place to place within the installation. These two factors together lead to the conclusion that engineering controls are relatively more expensive for the small employer and, therefore, more difficult to justify on grounds of economics, and that such controls in a small shop are more difficult to design and operate effectively. For these reasons, we believe that the small employer and the intermittent user of asbestos

REASONS (continued)

and asbestos containing materials should be given the option, within stringent limitations, to employ work practices and personal protection as his primary mode of compliance.

10. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(3) PARTICULAR TOOLS All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits prescribed in paragraph (c) of this section, such as, but not limited to, saws, scorers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(3) PARTICULAR TOOLS Insofar as practicable, all (hand-operated and power-operated) portable or fixed location power tools which in any reasonably foreseeable use may produce or release asbestos fibers in excess of the exposure limits prescribed in paragraph (c) of this section, such as, but not limited to, saws, scorers, abrasive wheels and drills, shall be provided with local exhaust ventilation systems.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(3) PARTICULAR TOOLS Insofar as practicable, all portable or fixed location power tools which in any reasonably foreseeable use may produce or release asbestos fibers in excess of the exposure limits prescribed in paragraph (c) of this section, such as, but not limited to, saws, scorers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems.

REASONS

Hand tools which are not power operated generate little dust and cannot practicably be equipped with local exhaust ventilation systems.

REASONS (continued)

Moreover, if hand tools are being employed, power may not be available to operate an exhaust ventilation system.

There are work situations in which it is not feasible to equip portable power tools with dust control equipment, as well as situations in which their use without exhaust ventilation does not release airborne fibers in excess of the allowable limits. The industry proposal requires exhaust ventilation "insofar as practicable" wherever power tools are used in ways that produce dust in concentrations beyond the prescribed limits.

11. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(4) WORK PRACTICES * * * * *

(ii) PARTICULAR PRODUCTS AND OPERATIONS

(A) No asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, or enclosed, or ventilated so as to prevent effectively the release of airborne asbestos fibers in excess of the limits prescribed in paragraph (c) of this section.

(B) Employees engaged in the spraying of asbestos, and in the removal of asbestos insulation or coverings shall be provided with respiratory equipment and protective clothing in accordance with paragraph (g) of this section.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(4) WORK PRACTICES * * * * *

(ii) PARTICULAR PRODUCTS AND OPERATIONS

(A) No asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, (or) enclosed, (or) ventilated or otherwise handled so as to prevent effectively the release of airborne asbestos fibers in excess of the limits prescribed in paragraph (c) of this section.

(B) Employees engaged in the spraying of asbestos, and in the removal of asbestos insulation or coverings shall be provided with respiratory equipment and protective clothing in accordance with paragraph (g) of this section.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(4) WORK PRACTICES * * * * *

(ii) PARTICULAR PRODUCTS AND OPERATIONS

(A) No asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, enclosed, ventilated or otherwise handled so as to prevent effectively the release of airborne asbestos fibers in excess of the limits prescribed in paragraph (c) of this section.

(B) Employees engaged in the spraying of asbestos, and in the removal of asbestos insulation or coverings shall be provided with respiratory equipment and protective clothing in accordance with paragraph (g) of this section.

REASONS

The words "or otherwise handled" are added because there are alternative ways to package and handle dry asbestos containing products without creating concentrations of airborne asbestos fibers in excess of the allowable limits.

12. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(5) LOCAL EXHAUST VENTILATION Local exhaust ventilation and dust collection systems shall be designed, constructed, installed and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z 9.2-1971, which is incorporated for reference herein. (See Section 1910.6 of this part concerning the availability of ANSI Z 9.2-1971, and the maintenance of a historic file in connection therewith).

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(5) LOCAL EXHAUST VENTILATION To the extent that it may be appropriate, local exhaust ventilation and dust collection systems shall be designed, constructed, installed and maintained in accordance with recommendations contained in (the) American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z 9.2-1971, which is incorporated for reference herein, or equivalent. (See Section 1910.6 of this part concerning the availability of ANSI Z 9.2-1971, and the maintenance of an historic file in connection therewith).

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(5) LOCAL EXHAUST VENTILATION To the extent that it may be appropriate, local exhaust ventilation and dust collection systems shall be designed, constructed, installed and maintained in accordance with recommendations contained in American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z 9.2-1971, which is incorporated for reference herein, or equivalent. (See 1910.6 of this part concerning the availability of ANSI Z 9.2-1971, and the maintenance of an historic file in connection therewith.

REASONS

ANSI standards are broadly written and may not fit the individual case. Alternative systems may achieve equivalent or superior reductions in dust levels. ANSI standards are amended at infrequent intervals and may lag current technology by as much as 3 - 5 years. The regulation should not inhibit the application of the best current technology to each specific dust control problem.

13. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(6) MECHANICAL VENTILATION When mechanical ventilation is used to control exposure, measurements which demonstrate the effectiveness of the system to control the exposure, such as capture velocity, duct velocity, or static pressure, shall be made at least every 3 months. Measurements of the system's effectiveness to control exposure shall be made within 5 days of any change in production, process or control which might result in any change in employee exposure.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(6) MECHANICAL VENTILATION When mechanical ventilation is used to control exposure, measurements which demonstrate the effectiveness of the system to control the exposure, such as capture velocity, duct velocity, or static pressure, shall be made (at least every 3 months) as frequently as required in accordance with sound engineering practice. Measurements of the system's effectiveness to control exposure shall also be made within (5) 30 days (of) following any change in production, process or control which might result in (any change in employee exposure) an increase in airborne concentrations of asbestos fibers.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(6) MECHANICAL VENTILATION When mechanical ventilation is used to control exposure, measurements which demonstrate the effectiveness of the system to control the exposure, such as capture velocity, duct velocity, or static pressure, shall be made as frequently as required in accordance with sound engineering practice. Measurements of the system's effectiveness to control exposure, shall also be made within 30 days following any change in production, process or control which might result in an increase in airborne concentrations of asbestos fibers.

REASONS

Testing an exhaust system every 3 months would constitute an unnecessary and unreasonable burden and expense, unless justified by sound engineering practice.

No statutory purpose would be served by retesting an exhaust system after a change in production, process or control which clearly reduces airborne concentrations of asbestos fibers.

Because those employers who lack the capabilities within their own organizations to perform the mandated tests may not be able to induce an outside contractor to act within 5 days, a period of 30 days should be allowed for completion of the tests.

14. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(7) COMPLIANCE PROGRAM:

(i) Every employer shall establish and implement a written program to reduce exposure to or below the permissable exposure limits solely by means of engineering and work practice controls.

(ii) The written program shall include:

(A) A description of each exposed operation, e.g., crew size, operating procedures and maintenance practices.

(B) Engineering plans and studies used to determine the controls for operation.

(C) A report of the technology considered in meeting the permissable exposure limits.

(D) Monitoring data.

(E) A detailed schedule for implementation of the engineering controls and work practices that cannot be implemented immediately as well as for the development and implementation of any additional engineering and work practices necessary to meet the permissable exposure limits.

(F) Other relevant information.

(iii) Written plans for compliance programs shall be submitted, upon request, to the Assistant Secretary and Director, and shall be available at the worksite for examination and copying by the Assistant Secretary and the Director. Such written plans shall be revised and updated at least every six months to reflect the current status of the program

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(7) Delete.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(f) METHODS OF COMPLIANCE * * * * *

(7) Delete.

REASONS

There is no information or data required to be included in the written compliance program which is not available elsewhere in the employer's records or which cannot be developed from those records. All such records are subject to inspection by the compliance officer.

The fundamental purpose of the Occupational Safety and Health Act, employee health, will be better served if engineering time required to prepare a written compliance program is devoted, instead, to the development, installation and operation of dust-free processes, improved engineering controls and better work practices.

Small employers, who may lack the skills within their own organizations to develop written compliance programs, would be heavily burdened by the requirements of this provision of the proposed regulation.

15. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION

(1) USE Respirators shall be used where required under this section. Compliance with the permissable exposure limits may not be achieved by the use of respirators, except:

(i) During the time period necessary to install engineering or work practice controls; or

(ii) In work situations in which engineering controls and supplemental work practice controls are insufficient to reduce exposure to or below the permissable exposure limits; or

(iii) In emergencies.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION

(1) USE (Respirators shall be used where) Where respiratory protection is required under this section, compliance with the permissable exposure limits may not be achieved by the use of respirators, except:

(i) During the time period necessary to install engineering or work practice controls; or

(ii) In work situations in which engineering and work practice controls are not feasible; or

((ii)) (iii) In work situations in which engineering controls and supplemental work practice controls are insufficient to reduce exposure to or below the permissable exposure limits; or

(iv) In those situations described in paragraph (f) (2) of this section; but in such situations time-weighted average concentrations of airborne asbestos fibers during the time that asbestos or asbestos containing products are being used, handled, fabricated or installed may not exceed 10 times the 8 hour time-weighted

RECOMMENDED CHANGES (continued)

average concentration prescribed in paragraph (c) (1), a respirator may not be used by any employee for more than 30 minutes in any hour nor for more than an aggregate of 2 hours in any work day, no such employee may be exposed to airborne asbestos fibers in excess of the permissable limits prescribed in paragraph (c) while he is not wearing his respirator, and the employer shall be especially careful to comply in full with the requirements of paragraph (k) of this section; or

((iii)) (v) In emergencies.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION

(1) USE Where respiratory protection is required under this section, compliance with the permissable exposure limits may not be achieved by the use of respirators, except:

(i) During the time period necessary to install engineering or work practice controls; or

(ii) In work situations in which engineering and work practice controls are not feasible; or

(iii) In work situations in which engineering and work practice controls are insufficient to reduce exposure to or below the permissable exposure limits; or

(iv) In those situations described in paragraph (f) (2) of this section; but in such situations time-weighted average concentrations of airborne asbestos fibers during the time that asbestos or asbestos containing products are being used, handled, fabricated or installed may not exceed 10 times the 8-hour time-weighted average concentration prescribed in paragraph (c) (1), a respirator may not be used by any employee for more than 30 minutes in any hour nor for more than an aggregate of 2 hours in any work day, no such employee may be exposed to airborne asbestos fibers in excess of the permissable limits prescribed in paragraph (c) while he is not wearing his respirator, and

INDUSTRY PROPOSAL (continued)

the employer shall be especially careful to comply in full with the requirements of paragraph (k) of this section; or

(v) In emergencies.

REASONS

It seems essential to the asbestos industry that the use of respiratory protection as a method of compliance with the regulation be expanded for the following reasons:

1. Dust emission points in an asbestos handling or manufacturing facility often are ill-defined (cf., a smoke stack as an emission source) and fugitive; and, if the emission source is broadly defined (the whole factory or shop), employees actually must work within the emission source itself.

2. Small and intermittent users of asbestos or asbestos containing materials frequently cannot justify, on grounds of economics, the installation and operation of relatively costly equipment for the control of asbestos fiber emissions.

3. With airborne fiber concentrations limited to 10 times the permissable TWA level, the respirator to be selected and worn under paragraph (g) (2) of the regulation would be light and relatively comfortable.

It should be made clear also that respirators may be worn where engineering and work practice controls are not feasible.

16. OSHA PROPOSAL

SECTION 1910.1-91 ASBESTOS

(g) RESPIRATORY PROTECTION * * * * *

(2) SELECTION Where respirators are permitted by this section, the employer shall select them from among those approved by the Natioanl Institute for Occupational Safety and Health, U.S. Department of Health, Education and Welfare, pursuant to 30 CFR Part 11, and in accordance with Table 1 set out below.

TABLE 1

RESPIRATORY PROTECTION AGAINST ASBESTOS FIBERS

CONCENTRATION OF ASBESTOS	REQUIRED RESPIRATOR
Over 2,000 times the applicable exposure limit prescribed in paragraph (c) of this section.	(A) Self-contained breathing apparatus with a full facepiece in pressure-demand (positive pressure) mode.
Up to 2,000 times the applicable exposure limit prescribed in paragraph (c) of this section.	(A) A type C supplied air respirator with a full facepiece operated in pressure-demand or other positive pressure-mode, or with a full facepiece, hood, or helmet operated in continuous flow mode.
Up to 1,000 times the applicable exposure limit prescribed in paragraph (c) of this section.	(A) A type C supplied air respirator operated in pressure-demand or other positive pressure or continuous flow mode; or (B) A powered air purifying respirator with a high efficiency particulate filter;[1] (C) self contained breathing apparatus in pressure demand (positive pressure) mode.
Up to 50 times the applicable exposure limit prescribed in paragraph (c) of this section.	(A) A high efficiency particulate filter respirator with a full facepiece; or (B) Any supplied air respirator with a full facepiece; or (C) Any self-contained breathing apparatus with a full facepiece.
Up to 10 times the applicable exposure limit prescribed in paragraph (c) of this section.	(A) Any air purifying respirator with replaceable particulate filter; or (B) Any single use respirator with or without valve; or (C) Any supplied air respirator; or (D) Any self-contained breathing apparatus.

[1]High efficiency filter - 99.97 percent efficient against 0.3 micron size dioctylphthalate (DOP).

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION * * * * *

(2) SELECTION * * * * *

Replace Table 1 with a revised table which defines exposure levels in terms of fibers per cc. instead of a multiple of a mandated exposure limit.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION * * * * *

TABLE 1

RESPIRATORY PROTECTION AGAINST ASBESTOS FIBERS

CONCENTRATION OF ASBESTOS	REQUIRED RESPIRATOR
Over 1,000 fibers per cubic centimeter of air as an 8-hour time-weighted average concentration or over 5,000 fibers per cubic centimeter of air as a ceiling concentration.	(A) Self-contained breathing apparatus with a full facepiece in pressure-demand (positive pressure) mode.
Up to 1,000 fibers per cubic centimeter of air as an 8-hour time-weighted average concentration and up to 5,000 fibers per cubic centimeter of air as a ceiling concentration.	(A) A type C supplied air respirator with a full facepiece operated in pressure-demand or other positive pressure-mode, or with a full facepiece, hood, or helmet operated in continuous flow mode.
Up to 500 fibers per cubic centimeter of air as an 8-hour time-weighted average concentration and up to 2,500 fibers per cubic centimeter of air as a ceiling concentration.	(A) A type C supplied air respirator operated in pressure-demand or other positive pressure or continuous flow mode; or (B) A powered air purifying respirator with a high efficiency particulate filter; or (C) Self-contained breathing apparatus in pressure demand (positive pressure) mode.

RESPIRATORY PROTECTION AGAINST ASBESTOS FIBERS

CONCENTRATION OF ASBESTOS	REQUIRED RESPIRATOR
Up to 50 fibers per cubic centimeter of air as an 8-hour time-weighted average concentration and up to 250 fibers per cubic centimeter of air as a ceiling concentration.	(A) A high efficiency particulate filter respirator with a full facepiece; or (B) Any supplied air respirator with a full facepiece; or (C) Any self-contained breathing apparatus with a full facepiece.
Up to 25 fibers per cubic centimeter of air as an 8-hour time-weighted average concentration and up to 125 fibers per cubic centimeter of air as a ceiling concentration.	(A) Any air purifying respirator with replaceable particulate filter; or (B) Any single use respirator with or without valve; or (C) Any supplied air respirator; or (D) Any self-contained breathing apparatus.

[1]High efficiency filter - 99.97 percent efficient against 0.3 micron size dioctylphthalate (DOP).

REASONS

It is unclear whether the exposure level to be used in connection with the factor in Table 1 is the standard exposure in paragraph (c) or the ceiling exposure in paragraph (c).

Publishing the table in terms of fibers per cc would avoid confusion and misunderstanding and would enhance the utility of the table for compliance and enforcement.

To encourage the use of respirators by employees where required, the use of light and relatively comfortable respirators should be permitted at the highest fiber concentrations deemed acceptable by NIOSH. If the requirements of Table 1 are made more stringent than the results of the NIOSH testing program would seem to demand, employees will be asked to wear respirators which are heavier and more uncomfortable than necessary, and they will be motivated to circumvent or sabatoge the personal protection compliance alternative.

17. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION * * * * *

(3) RESPIRATOR PROGRAM * * * * *

(iii) Employees who wear respirators shall be allowed to leave work areas to wash their face and respirator facepiece to prevent skin irritation due to respirator use.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION * * * * *

(3) RESPIRATOR PROGRAM * * * * *

(iii) Delete

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION * * * * *

(3) RESPIRATOR PROGRAM * * * * *

(iii) Delete.

REASONS

It is not the purpose of the Occupational Safety and Health Act to promote employee comfort or to interfere with normal, routine employer-employee relations. This kind of provision might encourage abuse by some employees; the entire matter is better left to reasonable management discretion and the collective bargaining process.

18. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION * * * * *

(3) RESPIRATOR PROGRAM * * * * *

(iv) No employee shall be assigned to tasks requiring the use of a respirator if, based upon his most recent examination, an examining physician has determined that the employee would be unable to function normally while wearing a respirator, or that the safety or health of the employee or other employees would be impaired by his use of a respirator. To the maximum extent possible, such employee shall be rotated to another job, or given the opportunity to transfer to a different position, whose duties he is able to perform, with the same employer, in the same geographical area and with the same seniority, status and rate of pay he had just prior to such transfer.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION * * * * *

(3) RESPIRATOR PROGRAM * * * * *

((iv)) (iii) No employee shall be assigned to tasks requiring the use of a respirator if, based upon his most recent examination (,) under paragraph (j), the (an) examining physician has determined that the employee would be unable to function normally while wearing a respirator, or that the safety or health of the employee or other employees would be impaired by his use of a respirator. To the (maximum) extent, permitted by any applicable collective bargaining agreement (possible), such employee shall be rotated to another job, or given the opportunity to transfer to a different position, whose duties he is able to perform with the same employer, in the same geographical area and with the same seniority, status and rate of pay he had just prior to such transfer (.) if such a different position is available.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(g) RESPIRATORY PROTECTION * * * * *

(3) RESPIRATOR PROGRAM * * * * *

(iii) No employee shall be assigned to tasks requiring the use of a respirator if, based upon his most recent examination under paragraph (j) the examining physician has determined that the employee will be unable to function normally while wearing a respirator, or that the safety or health of the employee or other employees will be impaired by his use of a respirator. To the extent permitted by any applicable collective bargaining agreement, such an employee shall be rotated to another job, or given the opportunity to transfer to a different position, the duties of which he is able to perform, with the same employer, in the same geographical area and with the same seniority, status and rate of pay as he had immediately prior to the transfer, if such a different position is available.

REASONS

A qualified industrial physician is best able to ascertain whether or not an employee safely can function with a respirator. To leave that determination to any physician is to invite some employees to shop for doctors who will give them the opinion which they want. One of the principal purposes of the medical examination required by paragraph (j) is to identify those employees who no longer safely can work at their job assignments.

Regulations issued under the Occupational Safety and Health Act should not intrude upon the collective bargaining process or be in conflict with the provisions of any applicable collective bargaining agreement, the National Labor Relations Act or other labor legislation. The removal of an employee from a job which poses a significant risk to his health and safety clearly is one of the objectives of OSHA, his transfer to another job without loss of seniority clearly is not. This

REASONS (continued)

latter objective must be sought under the egis of other pertinent laws or regulations, the collective bargaining contract or through appeal to management discretion.

19. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING

(1) The employer shall provide, and require the use of, personal protective clothing, such as coveralls or similar whole body clothing, head coverings, gloves and foot coverings, for any employee exposed to airborne concentrations of asbestos fibers which exceed either of the limits prescribed in paragraph (c) of this section.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING

(1) The employer shall provide, and require the use of, personal (protective) work clothing (, such as coveralls or similar whole body clothing, head coverings, gloves and foot coverings,) for any employee (exposed to airborne concentrations of asbestos fibers which exceed either of the limits prescribed in paragraph (c) of this section.) assigned to work in a regulated area or assigned to handle an emergency.

NOTE: Phrases in parenthesis are deletions. Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING

(1) The employer shall provide and require the use of, personal work clothing for any employee assigned to work in a regulated area or assigned to handle an emergency.

REASONS

There is no medical evidence to indicate that asbestos fibers in contact with the skin constitute any hazard to health. The purpose of a change of clothing at work, then, is to prevent the transport of fibers out of the workplace, and into other areas where they may become

REASONS (continued)

airborne and respirable. Under these circumstances, the clothing should not be described as "protective".

In some opeations (i.e., textiles), gloves are dangerous to wear. In other operations involving the manufacture or use of asbestos, employees work at elevated temperatures and would object strongly to the use of whole body coverings. As long as that work clothing which the employee actually wears is supplied by the employer and is not removed from the place of employment, and the employee then showers after work, the purposes of the Act are satisfied.

The wording of the OSHA proposal would suggest that, after the event, an employee who had been casually or accidentally exposed to concentrations of airborne asbestos fibers over the prescribed limits, be given special clothing. It would seem more logical to issue special work clothing to all employees assigned to work in regulated areas or to handle an emergency, since it is they who might reasonably be expected to be exposed to the higher concentrations of airborne fibers.

20. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(2) Clean and dry protective clothing and equipment shall be provided to each affected employee at least daily.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(2) Clean and dry (protective) work clothing (and equipment) shall be provided to each affected employee at least (daily) weekly.

NOTE: Phrases in parenthesis are deletions. Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(2) Clean and dry work clothing shall be provided to each affected employee at least weekly.

REASONS

Since paragraph (h) (1) does not refer to "equipment", the reference to "equipment" in paragraph (h) (2) and in following paragraphs is unnecessary and confusing.

The OSHA proposal for change of clothing is unnecessarily burdensome and costly. In most cases, work clothing does not become noticeably contaminated with dust in less than one week, while a weekly change should satisfy the requirements of personal hygiene. The employer, in his discretion, will issue clean work clothing at more frequent intervals whenever indicated by the circumstances.

21. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(3) The employer shall clean, launder, maintain or dispose of protective clothing and equipment required by this section.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(3) The employer shall clean, launder, maintain or dispose of (protective) work clothing and equipment required by this section.

NOTE: Phrases in parenthesis are deletions. Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL WORK CLOTHING * * * * *

(3) The employer shall clean, launder, maintain or dispose of work clothing required by this section.

REASONS

The word "work" is substituted for the word "protective" per comment under paragraph (h) (1) above.

22. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(4) The employer shall assure that all protective clothing and equipment is removed only in change rooms required by paragraph (i) (1) of this section.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(h) PERSONAL (PROTECTIVE) WORK CLOTHING

(4) The employer shall (assure) require that (all protective) work clothing (and equipment is) issued pursuant to paragraph (h) (1) be removed only in the regulated area or in change rooms required by paragraph (i) (1) of this section.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL WORK CLOTHING * * * * *

(4) The employer shall require that work clothing issued pursuant to paragraph (h) (1) be removed only in the regulated area or in change rooms required by paragraph (i) (1) of this section.

REASONS

Because an employer may require, but cannot guarantee prescribed behavior on the part of his employees, the word "require" is substituted for the word "assure".

The word "work" is substituted for the word "protective" per comment under paragraph (h) (1) above.

The phrase "and equipment" is deleted, because an employee should

REASONS (continued)

be permitted to remove his respirator whenever and wherever airborne concentrations of asbestos fibers are below the mandated 8-hour time-weighted average standard.

This paragraph should not apply to work clothing worn by employees working in non-regulated areas.

Employees working in regulated areas may wish to remove outer garments because they are too warm; and they should be permitted to do that, as long as they do not remove the garment from the regulated area.

23. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(5) The employer shall assure that no employee removes contaminated protective clothing and equipment from the change room, except for the purpose of cleaning, laundering, maintenance, or disposal.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(5) Except when it is worn, in the course of employment, into other areas in or around the workplace, the employer shall (assure) require that (no employee removes) contaminated (protective) work clothing and equipment be removed from a regulated area or the change room (except) only for the purpose of cleaning, laundering, maintenance, or disposal.

NOTE: Phrases in parenthesis are additions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(5) Except when it is worn, in the course of employment, into other areas in or around the workplace, the employer shall require that contaminated work clothing and equipment be removed from a regulated area or the change room only for the purpose of cleaning, laundering, maintenance or disposal.

REASONS

Since it may not be possible, in every asbestos operation, to confine to regulated areas all employees regularly assigned there, and since it is impractical to require that such employees shower and change each time they leave their work areas, the regulation should indicate that they may leave change rooms or their work areas wearing contaminated

REASONS (continued)

work clothing. The possibility in normal use that asbestos fibers on such clothing may become airborne in concentrations above permissable limits is remote.

Because an employer may require but cannot guarantee prescribed behavior on the part of his employees, the word "require" is substituted for the word "assure".

The word "work" is substituted for the word "protective" per comment under paragraph (h) (1) above.

24. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(6) Contaminated protective clothing and equipment shall be placed in impermeable closed containers.

(7) The employer shall inform any person who launders or cleans protective clothing and equipment contaminated with asbestos of the potentially harmful effects of exposure to asbestos fibers.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(h) PERSONAL PROTECTIVE CLOTHING * * * * *

(6) Contaminated (protective) work clothing (and equipment) issued pursuant to paragraph (h) (1) of this section when ready for cleaning, laundering, repair, or disposal, shall be placed in (impermeable) dust-tight, closed containers or dust-tight, sealed bags, and such containers and bags shall bear labels in accordance with paragraph (1) (2) of this section.

((7) The employer shall inform any person who launders or cleans protective clothing and equipment contaminated with asbestos of the potentially harmful effects of exposure to asbestos fibers.)

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(h) PERSONAL WORK CLOTHING * * * * *

(6) Contaminated work clothing issued pursuant to paragraph (h) (1) of this section when ready for cleaning, laundering, repair or disposal, shall be placed in dust-tight, closed containers or dust-tight, sealed bags, and such containers and bags shall bear labels in accordance with paragraph (1) (2) of this section.

REASONS

The word "work" is substituted for the word "protective" per comment under paragraph (h) (1) above.

Until such time as it is to be cleaned, laundered, repaired or discarded, contaminated work clothing will be stored in the separate storage facility prescribed by paragraph (i) (1).

Strictly speaking, there are no "impermeable" containers. "Dust-tight" would be a more accurate description.

The wording "potentially harmful effects" is vague and the exact nature and extent of the effects is controversial, even among recognized experts. Employers generally are not qualified by training or experience to "inform. . .of the potentially harmful effects of exposure to asbestos fibers". They should not be burdened with this duty and should not be held accountable for performing a function which exceeds their capabilities. It would seem sufficient, for the purposes of the Act, to place a standard warning label on any container used for contaminated clothing.

25. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES

(1) CHANGE ROOMS

Where employees wear protective clothing and equipment, clean change rooms equipped with storage facilities for street clothes and separate storage facilities for protective clothing and equipment shall be provided.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES

(1) CHANGE ROOMS

Where employees are required to wear (protective) work clothing (and equipment) provided by the employer in accordance with paragraph (h) (1) of this section, clean change rooms equipped with storage facilities for street clothes and separate (storage) facilities for protective clothing and equipment shall be provided.

NOTE: Phrases in parenthesis are deletions. Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES

(1) Where employees are required to wear work clothing provided by the employer in accordance with paragraph (h) (1) of this section, clean change rooms equipped with storage facilities for street clothes and separate facilities for such work clothing shall be provided.

REASONS

The word "work" is substituted for the word "protective" per comment under paragraph (h) (1) above.

REASONS (continued)

Because of the costs involved, the requirement that special change rooms must be provided should be limited to facilities for those employees required to wear special clothing under paragraph (h) (1).

26. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

(2) SHOWERS

Employees working in regulated areas shall be required to shower before leaving at the end of the work shift. The employer shall provide shower facilities in accordance with Section 1910.141 (d) (3) of this part.

(3) LAVATORIES

Employees working in regulated areas shall be required to wash hands, face and forearms prior to drinking, eating or smoking. The employer shall provide an adequate number of lavatories for this purpose which shall meet the requirements of Section 1910.141 (d) (1) and (2) of this part.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

(2) SHOWERS

Employees working in regulated areas shall be (required) requested to shower before leaving at the end of the work shift. The employer shall provide shower facilities in accordance with Section 1910.141 (d) (3) of this part.

(3) LAVATORIES

Employees working in regulated areas shall be (required) requested to wash hands, face, and forearms prior to drinking, eating, or smoking. The employer shall provide an adequate number of lavatories for this purpose which shall meet the requirements of Section 1910.141 (d) (1) and (2) of this part.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 **ASBESTOS**

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

(2) SHOWERS

Employees working in regulated areas shall be requested to shower before leaving at the end of the work shift. The employer shall provide shower facilities in accordance with Section 1910.141 (d) (3) of this part.

(3) LAVATORIES

Employees working in regulated areas shall be requested to wash hands, face and forearms prior to drinking, eating or smoking. The employer shall provide an adequate number of lavatories for this purpose which shall meet the requirements of Section 1910.141 (d) (1) and (2) of this part.

REASONS

To place an obligation upon the employer to require that certain of his employees shower before leaving work and to require that they wash before drinking, eating or smoking raises some very difficult labor relations issues and would be virtually impossible to enforce. The ultimate employer's sanction, discharge, if applied, probably would be challenged, might lead to burdensome arbitration proceedings and seems excessive for the offenses of not washing or showering. Lesser sanctions also might be challenged and, at the least, would disrupt cooperative working relationships. In addition it would be patently absurd for a supervisor to be required to ascertain whether or not an employee had washed before he smoked or took a drink at a drinking fountain, or even to ascertain whether or not all employees working in a regulated area had showered before departing for home. We think it

REASONS (continued)

more feasible to provide shower and lavatory facilities, train employees in the health hazards of asbestos and ask that they shower and wash.

27. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

(4) ARRANGEMENT OF SHOWER FACILITIES

Clothes lockers and shower facilities shall be arranged so as to separate regulated areas and non-contaminated areas.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

(4) Delete

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

(4) Delete

REASONS

If it is the intent of the OSHA proposal that employees shall be able to enter or leave a regulated area only by passing through a clothes locker and shower facility, the concept is not practical. Materials used in the regulated area cannot enter through the locker room, nor can the product of the regulated area leave there through the locker room. And employees may (and sometimes must) move where materials and products move.

If it is the intent of the OSHA proposal to exclude non-regulated area employees from the regulated area locker and shower rooms because the rooms are dangerous, the objective is unnecessary. If airborne

REASONS (continued)

asbestos fiber levels in the locker and shower rooms exceed the permissable limits, those rooms themselves will be regulated areas and access will be limited to authorized personnel.

If it is the intent of the OSHA proposal that a locker room and shower facility shall be adjacent to each regulated area, the objective may be a very costly one to achieve and would serve no useful purpose. It is not feasible to confine regulated area employees exclusively to those areas, and other employees (i.e., maintenance employees) must be free to move from regulated to non-regulated areas. Under these circumstances, the passage of regulated area employees through non-regulated areas at the end of the work shift would seem to create little additional health hazard. In some existing plants, it would not be possible to construct shower and locker facilities adjacent to regulated areas, simply because the necessary space is not available. In other instances, the installation of such facilities, which may involve significant piping and plumbing expense, would be very costly indeed.

Change and shower rooms should, of course, be so located that an employee who has showered and changed at the end of his shift, may leave for home without reentering the regulated area; it would, however, be an exceptional workplace that already is not so arranged.

28. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

(5) ARRANGEMENT OF LAVATORY FACILITIES

Lavatory and toilet facilities which are located in regulated areas shall be arranged so that no access is available from them to uncontaminated areas.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * *

(5) Delete.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

(5) Delete.

REASONS

Lavatory facilities in a regulated area will be clearly identified by the signs required under paragraph (1) of this section. It would be an unreasonable burden on employers to require that they be physically walled or fenced off from non-regulated areas.

29. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

(6) PROHIBITION OF ACTIVITIES IN REGULATED AREAS

The presence or consumption of food or beverages, the presence or use of smoking or nonfood chewing products shall be prohibited in regulated areas.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

((6)) (4) PROHIBITED ACTIVITIES IN REGULATED AREAS

The employer shall advise employees that the presence of or consumption of food or beverages, the presence or use of smoking or nonfood chewing products (shall be prohibited) is not permitted in regulated areas.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(i) HYGIENE FACILITIES AND PRACTICES * * * * *

(4) PROHIBITED ACTIVITIES IN REGULATED AREAS.

The employer shall advise employees that the presence or consumption of food or beverages, the presence or use of smoking or nonfood chewing products is not permitted in regulated areas.

REASONS

See comments re paragraph (i) (2) and (3) above. It would seem as difficult for an employer to prohibit eating and drinking by his employees in regulated areas or to forbid the presence there of food, beverages or smoking and chewing materials as to require that they shower or wash at specified times or under specified circumstances. It

REASONS (continued)

would seem more reasonable and practical to train employees in the health hazards of asbestos and then advise them of prohibited activities.

30. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE

(1) GENERAL

Every employer shall provide or make available at his cost medical examinations relative to exposure to asbestos, as required by this paragraph. If an employee refuses a medical examination provided in accordance with this paragraph, the employer shall inform the employee of the possible health consequences of such refusal, and shall obtain a signed statement from the employee stating that such employee has been informed of the consequences and refused to be examined.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE

(1) GENERAL

Every employer shall provide or make available at his cost medical examinations relative to exposure to asbestos, as required by this paragraph. Medical examinations shall be performed by or under the supervision of a licensed physician selected by the employer. If an employee refuses a medical examination provided in accordance with this paragraph, the employer shall inform the employee (of) that the examination is part of a program to protect him against the possible health (consequences) hazards of asbestos (such refusal) and shall endeavor to obtain a signed statement from the employee stating that such employee has been informed of the (consequences) purpose of the procedure and refused to be examined. If the employee will not sign such a statement, it shall be noted on his personnel record that the examination was refused.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE

(1) GENERAL

Every employer shall provide or make available at his cost medical examinations relative to exposure to asbestos, as required by this paragraph. Medical examinations shall be performed by or under the supervision of a licensed physician selected by the employer. If an employee refuses a medical examination provided in accordance with this paragraph, the employer shall inform the employee that the examination is part of a program to protect him against the health hazards of asbestos, and shall endeavor to obtain a signed statement from the employee stating that such employee has been informed of the purpose of the procedure and refuses to be examined. If the employee will not sign such a statement, it shall be noted on his personnal record that the examination was refused.

REASONS

To assure the high quality result which the purposes of the regulation demand, medical examinations should be conducted only by or under the supervision of a licensed physician; and to assure uniformity of interpretation of the data, a single physician with relevant training and experience must be selected by the employer to perform, or supervise the performance of, medical examinations upon all his employees.

Employers are not qualified by training or experience properly to "inform. . .of the possible health consequences of" a refusal to take a physical examination and, therefore, should not be required to perform this function.

An employer can do no more than ask an employee to sign a statement of refusal to take a physical examination. If he will not sign, a statement to that effect should be noted on his record.

31. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(2) PREPLACEMENT

The employer shall provide or make available to each of his employees, within 30 calendar days following his first employment in an area exposed to airborne concentrations of asbestos fibers, a comprehensive medical examination. Such examinations shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 X 17 inches), a history to elicit symptoms of respiratory disease, pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$) and for employees with 10 or more years of exposure to airborne concentrations of asbestos fibers or who are 45 years of age or older, a sputum cytology examination.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(2) PREPLACEMENT

The employer shall provide or make available to each of his employees, within 30 calendar days following his first employment in an area where he regularly will be exposed to airborne concentrations of asbestos fibers in excess of either of the allowable limits prescribed in paragraph (c) of this section, a comprehensive medical examination. Such examinations shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 X 17 inches), a history to elicit symptoms of respiratory disease, pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$) (and for employees with 10 or more years of exposure to airborne concentrations of asbestos fibers or who are 45 years of age or older, a sputum cytology examination).

NOTE: Phrases in parenthesis are deletions. Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(2) PREPLACEMENT

The employer shall provide or make available to each of his employees, within 30 calendar days following his first employment in an area where he regularly will be exposed to airborne concentrations of asbestos fibers in excess of either of the allowable limits prescribed in paragraph (c) of this section, a comprehensive medical examination. Such examination shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 X 17 inches), a history to elicit symptoms of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$).

REASONS

The words "an area exposed to airborne concentrations of asbestos fibers" describe every workplace in the United States. In most workplaces, asbestos containing materials will be present, if only as constituent parts of buildings or machinery; and, therefore, there will be at least a remote possibility that an asbestos fiber or two may be released. Even in workplaces where asbestos materials may not be present, atmospheric background levels of asbestos fibers will be encountered and, thus, there will be "airborne concentrations of asbestos fibers". Because of these words, the proposed regulation (the existing regulation contains similar wording) requires that virtually every employee in the United States be given a physical examination relative to asbestos exposure. If such an effect ever was intended for this provision, it would constitute a gross misapplication of limited medical resources and a serious failure properly to order industrial health priorities. Medical examinations to protect persons from the health hazards of asbestos must be administered only to individuals exposed to fiber concentrations above a stated level. For this purpose, the standard prescribed in paragraph (c) (1) (2 fibers

REASONS (contined)

per cc TWA) commends itself, first because it will be known (as a consequence of monitoring), second, because it is related to the basic purpose of the Occupational Safety and Health Act, and third, because it is at the lower level of reliability of the test method used to measure airborne fiber concentrations. In addition, a 2 fiber per cc TWA limit will relieve many small and intermittent users of asbestos and asbestos materials of the necessity of implementing a medical surveillance program.

There remains serious doubt about the value of sputum cytology as a diagnostic technique; and there are, in the United States, very few persons trained to make the test. It is premature to mandate the use of sputum cytology.

32. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(3) ANNUAL

Every employer shall provide or make available comprehensive medical examinations to each of his employees exposed to airborne concentrations of asbestos fibers at least annually. Such examination shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 X 17 inches), a history to elicit symptoms of respiratory disease, pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$) and, for employees with 10 or more years of exposure to airborne concentrations of asbestos fibers or who are 45 years of age or older, a sputum cytology examination.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(3) (ANNUAL) PERIODIC

Every employer shall provide or make available a comprehensive medical examination(s) to each of his employees regularly exposed to airborne concentrations of asbestos fibers in excess of either of the allowable limits prescribed in paragraph (c) of this section at the end of 5 years of employment, at the end of 10 years of employment and at least annually thereafter. Such examination shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 X 17 inches), a history to elicit symptoms of respiratory disease, pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$) (and, for employees with 10 or more years of exposure to airborne concentrations of asbestos fibers or who are 45 years of age or older, a sputum cytology examination).

NOTE: Phrases in parenthesis are deletions
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(3) PERIODIC

Every employer shall provide or make available a comprehensive medical examination to each of his employees regularly exposed to airborne concentrations of asbestos fibers in excess of either of the allowable limits prescribed in paragraph (c) of this section, at the end of 5 years of employment, at the end of 10 years of employment, and at least annually thereafter. Such examination shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 X 17 inches), a history to elicit symptoms of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$).

REASONS

See comments above re paragraph (j) (2) concerning the need to limit physical examinations to those employees exposed to airborne concentrations of asbestos fibers above a stated level.

Because there is widespread agreement among medical authorities that no detectable evidence of asbestos disease is likely to appear during the first 10 years following first exposure to airborne fibers, it is recommended that periodic medical examinations be given to employees only at the end of 5 and 10 years of employment and annually thereafter. This modification of the proposed regulation will obviate the necessity for giving periodic medical examinations to those employees who remain in the industry only for a short time, will reduce the cost of the medical surveillance and records retention program, and will limit X-ray exposure of individuals examined to that period of time within which a chest roentgenogram might be expected to provide useful diagnostic indications.

REASONS (continued)

The reference to sputum cytology is deleted for the reasons cited under sub-paragraph (2) above.

33. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(4) TERMINATION OF EMPLOYMENT

The employer shall provide or make available, within 30 calendar days before or after termination of employment of any employee exposed to airborne concentrations of asbestos fibers, a comprehensive medical examination. Such examination shall include, as a minimum, a chest roentgenogram (posterior-anterior 14 X 17 inches), a history to elicit symptoms of respiratory disease, pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$) and, for employees with 10 or more years of exposure to airborne concentrations of asbestos fibers or who are 45 years of age or older, a sputum cytology examination.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(4) Delete.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(4) Delete.

REASONS

If termination of employment should occur within the first 10 years following initial exposure to airborne asbestos fibers in excess of the limits prescribed in paragraph (c) of the section, it is unlikely that evidence of any asbestos disease would be observed as a consequence of a medical examination; so the termination examination would serve no useful purpose. See comments under paragraph (j) (3) above. If termination of employment should occur more than 10 years following

REASONS (continued)

initial exposure to airborne asbestos fibers in excess of the limits prescribed in paragraph (c) of the section, the terminated employee would have had a medical examination under the provisions of paragraph (j) (3) of the section within 12 months of termination. It is unlikely that a special termination examination would disclose any indications of disease not already observed during the last preceeding periodic examination. Moreover, employees often leave their jobs with little or no notice, providing no opportunity to schedule them for a termination medical examination; and, even if there is an opportunity to schedule them or if they can be traced, terminating or terminated employees have no incentive to take a physical examination. Paragraph (j) (4) of the OSHA proposal would be extremely difficult to implement.

34. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(5) RECENT EXAMINATIONS

No medical examination is required of any employee, if adequate records show that the employee has been examined in accordance with this paragraph within the past 1 year period.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(5) Renumber sub-paragraph.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(4) RECENT EXAMINATIONS

No medical examination is required of any employee, if adequate records show that the employee has been examined in accordance with this paragraph within the past 1 year period.

35. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(6) PHYSICIAN'S WRITTEN OPINION

(i) With respect to each examination required by this paragraph, the employer shall obtain a written opinion from the examining physician, containing the following:

(A) The physician's opinion as to whether the examined employee has any medical conditions which would place the employee at increased risk of material impairment of his or her health from exposure to asbestos fibers, or which would, directly or indirectly, be aggravated by such exposure.

(B) Any recommended limitations upon the employee's exposure to asbestos fibers, or upon the use of protective clothing and equipment, such as respirators; and

(C) A statement that the employee has been informed by the physician of any medical conditions which require further examination or treatment.

(ii) The written opinion shall not reveal specific findings or diagnoses unrelated to occupational exposure to asbestos fibers.

(iii) A copy of the written opinion shall be provided to the affected employee.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

((6)) (5) PHYSICIAN'S (WRITTEN OPINION) REPORT

(i) With respect to each examination required by this paragraph, the employer shall obtain a written (opinion) report from the examining physician, containing the following:

(A) The physician's (opinion as to whether the examined employee has any medical conditions which would place the employee at increased risk of material impairment of his or her health from exposure to asbestos fibers, or which would, directly or indirectly

RECOMMENDED CHANGES (continued)

be aggravated by such exposure) specific findings or diagnoses related to the employee's occupational exposure to asbestos.

(B) Any recommended limitations upon the employee's (exposure to asbestos fibers, or upon the) use of (protective clothing and equipment such as) respirators. (and)

((C) A statement that the employee has been informed by the physician of any medical conditions which require further examination or treatment.)

((ii) The written opinion shall not reveal specific findings or diagnoses unrelated to occupational exposure to asbestos fibers.)

((iii)) (ii) A copy of the physician's (written opinion) report shall be provided to the affected employee.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(5) PHYSICIAN'S REPORT

(i) With respect to each examination required by this paragraph, the employer shall obtain a written report from the examining physician, containing the following:

(A) The physician's specific findings or diagnoses related to the employee's occupational exposure to asbestos.

(B) Any recommended limitations upon the employee's use of respirators.

(ii) A copy of the physician's report shall be provided to the affected employee.

REASONS

The OSHA proposal appears to be unworkable. Because of the growing prevalence of malpractice claims, a physician either would refuse to give the opinion required by the OSHA wording or he would prepare an alarmist opinion for every employee recommending that he or she resign his or her job or otherwise terminate all possibility of exposure to airborne asbestos. A simple report of findings, instead of an "opinion" is recommended. The employee can take such a report to his personal physician who then can advise the employee in a fashion appropriate to the employee's capacity to comprehend and his individual temperament.

36. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(7) WITHDRAWAL FROM EXPOSURE

No employee shall be exposed to asbestos fibers in such a way as would put the employee at increased risk of material impairment of his or her health from such exposure. This determination may be based on the physician's written opinion.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(7) Delete.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(j) MEDICAL SURVEILLANCE * * * * *

(7) Delete.

REASONS

This provision obliges the employer to make a determination which he is not qualified to make.

Even if the opinion of an examining physician is made to control, the provision raises some of the same difficult labor-management issues discussed under paragraph (g) (iv) of the OSHA proposal.

37. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(k) EMPLOYEE INFORMATION AND TRAINING

(l) TRAINING PROGRAM * * * * *

(ii) The training program * * * * *

(A) The specific nature of the operations which could result in exposure to asbestos fibers as well as any necessary protective steps.

(B) * * * * *

(C) * * * * *

(D) * * * * * and

(E) A review of this standard.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(k) EMPLOYEE INFORMATION AND TRAINING

(l) TRAINING PROGRAM * * * * *

(ii) The training program* * * *

(A) The specific nature of the operations which could result in exposure to asbestos fibers in excess of either of the limits prescribed in paragraph (c) of this section, as well as any necessary protective steps.

(B) * * * * *

(C) * * * * *

(D) * * * * *

(E) An explanation of the monitoring and measurement procedures required by paragraph (e) of this section; and

(F) A review of this standard.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(k) EMPLOYEE INFORMATION AND TRAINING

(l) TRAINING PROGRAM * * * * *

(ii) The training program * * * * *

(A) The specific nature of the operations which could result in exposure to asbestos fibers in excess of either of the limits prescribed in paragraph (c) of this section, as well as any necessary protective steps.

(B) * * * * *

(C) * * * * *

(D) * * * * *

(E) An explanation of the monitoring and measurement procedures required by paragraph (e) of this section; and

(F) A review of this standard.

REASONS

Since everyone is exposed to asbestos fibers at some level, training should relate to the kind of event that might result in exposure above the prescribed standard. Hence it is recommended that employees be instructed in the "nature of the operations which could result in exposure . . .in excess of . . .the limits prescribed".

It would seem more appropriate and less disruptive of operations to give instructions in monitoring techniques during the training program than during actual monitoring of the workplace.

38. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(m) HOUSEKEEPING

(1) CLEANING

All exposed surfaces in any place of employment shall be maintained free of accumulations of asbestos fibers if their dispersion would create an airborne concentration in excess of the exposure limits prescribed in paragraph (c) of this section.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(m) HOUSEKEEPING

(1) CLEANING

All exposed surfaces in any place of employment shall, to the extent practicable, be maintained free of accumulations of asbestos fibers if their dispersion by any reasonably foreseeable plant operation would create an airborne concentration in excess of the exposure limits prescribed in paragraph (c) of this section.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(m) HOUSEKEEPING

(1) CLEANING

All exposed surfaces in any place of employment shall, to the extent practicable, be maintained free of accumulations of asbestos fibers if their dispersion by any reasonably foreseeable plant operation would create an airborne concentration in excess of the exposure limits prescribed in paragraph (c) of this section.

REASONS

Although accumulated dust which, if disturbed, might constitute a health hazard should be removed from workplace surfaces at frequent intervals; those surfaces could be "maintained free of accumulations" in many plant areas only by discontinuing all plant operations. The word "cleaning" used by OSHA in the title of this sub-paragraph implies that dust may be expected to accumulate for brief periods of time before it is removed. To maintain efficient manufacturing operations, dust removal must be accomplished at reasonably convenient times and by appropriate methods which will not increase health hazards. In addition, dust which is unlikely to be disturbed in the course of normal plant operations should be permitted to be removed less frequently.

39. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(m) HOUSEKEEPING * * * * *

(2) WASTE DISPOSAL

Asbestos waste, scrap, debris, bags, containers, equipment and asbestos contaminated clothing, consigned for disposal, which may produce in any reasonably foreseeable use, handling, storage, processing, disposal, or transportation, airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in paragraph (c) of this section shall be collected and disposed of in sealed impermeable bags, or other closed impermeable containers.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(m) HOUSEKEEPING * * * * *

(2) WASTE DISPOSAL

Asbestos waste, scrap, debris, bags, containers, equipment and asbestos-contaminated clothing, consigned for disposal, which may produce in any reasonably foreseeable use, handling, storage, processing, disposal, or transportation, airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in paragraph (c) of this section shall be collected and disposed of in sealed (impermeable) dust-tight bags, or other closed, (impermeable) dust-tight containers.

NOTE: Phrases in parenthesis are deletions.
Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(m) HOUSEKEEPING * * * * *

(2) WASTE DISPOSAL

Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, consigned for disposal, which may produce in any reasonably foreseeable use, handling, storage, processing, disposal or transportation, airborne concentrations of asbestos fibers in excess of the exposure limits prescribed in paragraph (c) of this section shall be collected and disposed of in sealed, dust-tight bags, or other closed, dust-tight containers.

REASONS

In a strict sense there is no such thing as an impermeable container. "Dust-tight" would be preferable wording.

40. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(n) RECORDKEEPING

(1) EXPOSURE RECORDS * * * * *

(ii) Each record of an employee's exposure shall be maintained for at least 40 years, or for the duration of the employee's employment plus 20 years, whichever period is longer.

(2) MEDICAL RECORDS * * * * *

(i) * * * * *

(A) Physician's written opinion * * * * *

(ii) Each record shall be maintained for at least 40 years or for the duration of the employee's employment plus 20 years, whichever period is longer.

(3) MECHANICAL VENTILATION MEASUREMENTS * * * * *

(ii) Each record shall be maintained for at least 3 years.

(4) EMPLOYEE TRAINING * * * * *

(ii) Each record shall be maintained for at least 3 years.

(5) ROSTERS

Each roster required by paragraph (d) of this section shall be maintained for at least 40 years or for the duration of the personnel's employment plus 20 years, whichever period is longer.

(6) AVAILABILITY

(i) All records required to be maintained by this section shall be made available, upon request, to the Assistant Secretary and the Director for examination and copying.

(ii) Employee exposure measurements records required by this paragraph shall be made available for examination and copying to employees, former employees and their designated representatives.

(iii) Employee medical records required by this paragraph shall be made available upon request for examination and copying to a physician designated by the employee or former employee.

40. OSHA PROPOSAL (continued)

(7) TRANSFER OF RECORDS

(i) In the event the employer ceases to do business, the successor shall receive and retain all records required to be maintained by this paragraph.

(ii) In the event the employer ceases to do business and there is no successor to receive and retain his records for the prescribed period, these records shall be transmitted by mail to the Director, and each employee and former employee shall be individually notified in writing of this transfer.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(n) RECORDKEEPING

(1) EXPOSURE RECORDS * * * * *

(ii) Each record of an employee's exposure shall be maintained for at least (40 years, or for the duration of the employee's employment plus 20 years, whichever period is longer) 5 years, at the end of which time the employer may destroy the record if he has not been directed to transmit it to the Director for permanent storage.

(2) MEDICAL RECORDS * * * * *

(i) * * * * *

(A) Physician's written (opinion) report. * * *

(ii) Each record shall be maintained for at least (40 years, or for the duration of the employee's employment plus 20 years, whichever period is longer) 5 years, at the end of which time the employer may destroy the record if he has not been directed to transmit it to the Director for permanent storage.

(3) MECHANCIAL VENTILATION MEASUREMENTS * * *

(ii) (Each record shall be maintained for at least 3 years). The most recent record for each installation which remains in service shall be maintained as a permanent file.

RECOMMENDED CHANGES (continued)

(4) EMPLOYEE TRAINING * * * *

(ii) Each record shall be maintained for (at least 3 years) a period of one year.

((5) ROSTERS

Each roster required by paragraph (d) of this section shall be maintained for at least 40 years or for the duration of the personnel's employment plus 20 years, whichever period is longer.).

((6)) (5) AVAILABILITY

(i) All records required to be maintained by this section shall be made available, upon request, to the Assistant Secretary and the Director for examination and copying.

((ii) Employee exposure measurements records required by this paragraph shall be made available for examination and copying to employees, former employees and their designated representatives.)

((iii)) (ii) Employee medical records required by this paragraph shall be made available upon request for examination and copying to a licensed physician designated by the employee or former employee.

(iii) Persons who examine or copy records under the provisions of this paragraph shall do so at their own cost and expense.

((7)) (6) TRANSFER OF RECORDS

(i) In the event that an (the) employer (ceases to do business, the successor) sells or otherwise transfers a business involving the use or handling of asbestos or products containing asbestos, his buyer or transferee shall receive and retain all records required to be maintained by this paragraph.

(ii) In the event that an employer discontinues permanently all use or handling of asbestos or products containing asbestos, he may, after a delay of 2 years, transmit by mail to the Director all records required to be maintained by this paragraph.

RECOMMENDED CHANGES (continued)

(iii) ((ii)) In the event that an (the) employer ceases to do business entirely (and there is no successor to receive and retain his records for the prescribed period, these records shall be transmitted) he may transmit forthwith by mail to the Director, all records required to be maintained by this paragraph.

NOTE: Phrases in parenthesis are deletions. Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(n) RECORDKEEPING

(1) EXPOSURE RECORDS * * * * *

(ii) Each record of an employee's exposure shall be maintained for at least 5 years, at the end of which time the employer may destroy the record if he has not been directed to transmit it to the Director for permanent storage.

(2) MEDICAL RECORDS * * * * *

(i) * * * * *

(A) Physician's written report. * * * *

(ii) Each record shall be maintained for at least 5 years, at the end of which time the employer may destroy the record if he has not been directed to transmit it to the Director for permanent storage.

(3) MECHANICAL VENTILATION MEASUREMENTS * * * * *

(ii) The most recent record for each installation which remains in service shall be maintained as a permanent file.

(4) EMPLOYEE TRAINING * * * * *

(ii) Each record shall be maintained for a period of one year.

(5) AVAILABILITY

(i) All records required to be maintained by this section shall be made available, upon request, to the Assistant Secretary and the Director for examination and copying.

INDUSTRY PROPOSAL (continued)

(ii) Employee medical records required by this paragraph shall be made available upon request for examination and copying to a licensed physician designated by the employee or former employee.

(iii) Persons who examine or copy records under the provisions of this paragraph shall do so at their own cost and expense.

(6) TRANSFER OF RECORDS

(i) In the event that an employer sells or otherwise transfers a business involving the use or handling of asbestos or products containing asbestos, his buyer or transferee shall receive and retain all records required to be maintained by this paragraph.

(ii) In the event that an employer discontinues permanently all use or handling of asbestos or products containing asbestos, he may, after a delay of 2 years, transmit by mail to the Director all records required to be maintained by this paragraph.

(iii) In the event that an employer ceases to do business entirely, he may transmit forthwith by mail to the Director, all records required to be maintained by this paragraph.

REASONS

Historical records of employee exposure to airborne asbestos and records of employee medical examinations have value only for two purposes: to provide information to assist in the health care of the individual employee and to provide data for future epidemiological studies. For the former purpose, five years of records should suffice to indicate change in physical condition or the development of any symptoms which may be present. For the latter purpose, the major portion of the data which will be generated within the industry will be of no use.

Sound epidemiological studies begin with the selection of populations suitable for analysis. The employees of small employers will be rejected, because the cohorts will not be large enough to

REASONS (continued)

support reliable statistical conclusions. Other cohorts may be rejected because the character of their exposure is poorly defined, not representative of a significant segment of the workforce, or complicated by simultaneous exposure to other detrimental substances. In addition, the quality of records, particularly X-ray films, stored by hundreds or thousands of different employers for many years under a variety of circumstances and often with questionable degrees of care, will be of doubtful quality and may have little utility for research. The OSHA proposal mandates long-term records retention by employers. It would seem more logical for the government, or private researchers acting through the government, to identify work-place populations worthy of detailed epidemiological study and then to direct that the records of these populations be transferred to a suitable repository for proper indexing and storage under suitable physical conditions. This kind of approach to the problem of expanding our knowledge of the health effects of asbestos would relieve the industry of significant costs and administrative burdens and would assure the creation of a high quality and convenient body of data for study and analysis by health scientists. We propose a five year period within which the government may take possession of an employer's exposure or medical records. If the government fails to act within that time; the employer may destroy the records, if he chooses.

The wording in paragraph (2) (i) (A) "physician's written opinion" should be changed to be consistent with the recommendation made in paragraph (j) MEDICAL SURVEILLANCE.

REASONS (continued)

Mechanical ventilation records are not relevant to epidemiological studies. They may have value to the compliance officer to indicate the degree of care which the employer is exercising in keeping his dust control equipment operating efficiently. For this purpose, the most recent record should suffice. Employers should be relieved of the burden of maintaining any additional mechanical ventilation test records.

Since, under the statute, an employer can be charged with a violation only within 6 months of its occurrence, a record of the most recent employee training program should be sufficient for the compliance officer.

Since, under paragraph (d), we have recommended that no roster of persons entering a regulated area be maintained, the requirement for retention of the rosters has been deleted here in paragraph (n). The following sub-paragraphs have been renumbered.

It is recommended that the provision requiring that employee exposure measurements be made available to employees, former employees, and their designated representatives be deleted. Exposure measurement records have no value to employees or former employees except in an action at law against the employer and others. If court proceedings are initiated, they are available upon subpoena.

REASONS (continued)

Persons who have the right, under the regulation, to examine or copy an employer's records, equitably should pay the cost of exercising this privilege.

Broader language is suggested for the transfer of records paragraph to cover additional situations which might be encountered. Provision should be made for the preservation of records both when an employer liquidates his entire business and when he simply discontinues his asbestos business.

It would be burdensome and, in some cases, impossible to notify all former employees of the transfer of records. Moreover, the benefit is not worth the effort, since every employee will know that his record may be found during the retention period either among the files of the employer or his successor or at the office of the Director.

41. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(o) OBSERVATION OF MONITORING * * * * *

(2) OBSERVATION PROCEDURES

(ii) Without interfering with the measurement, observers shall be entitled to receive an explanation of the monitoring or measurement procedures, observe all steps related to the measurements and to record the results obtained.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(o) OBSERVATION OF MONITORING * * * * *

(2) OBSERVATION PROCEDURES

(ii) Without interfering with the measurement, observers shall be entitled to (receive an explanation of the monitoring or measurement procedures,) observe all steps related to (the measurements) monitoring and to record the results obtained.

NOTE: Phrases in parenthesis are deletions. Phrases underlined are additions.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(o) OBSERVATION OF MONITORING * * * * *

(2) OBSERVATION PROCEDURES

(ii) Without interfering with the measurement, observers shall be entitled to observe all steps related to monitoring and to record the results obtained.

REASONS

If an explanation of monitoring procedures is required, that explanation might better be accomplished as part of the employee information and training program offered under paragraph (k). A corresponding change has been suggested for paragraph (k).

42. OSHA PROPOSAL

SECTION 1910.1001 ASBESTOS

(p) APPENDICES

The information contained in the appendices to this section is not intended, by itself, to create any additional obligations not otherwise imposed, or to detract from any existing obligation.

RECOMMENDED CHANGES

SECTION 1910.1001 ASBESTOS

(p) APPENDICES

Delete this paragraph and all the appendices.

INDUSTRY PROPOSAL

SECTION 1910.1001 ASBESTOS

(p) APPENDICES.

Delete this paragraph and all the appendices.

REASONS

Because it is easier to revise this material and to keep it up to date if it is not part of the regulation subject to cumbersome rule-making procedures; we recommend the elimination of the paragraph and of the appendices themselves. If they are to be retained, however, they must be revised to eliminate inaccuracies and inconsistencies with the regulation as finally adopted.

3

Statement by Hans Weill, M.D., on Rules on Occupational Exposure to Asbestos proposed by OSHA (Docket No. H-033)

By way of introduction, I am Professor of Medicine at Tulane University School of Medicine and direct a large interdisciplinary program in the investigation of occupational lung diseases. These research activities involve all varieties of inhalants including mineral and organic dusts and chemical vapors and gases. The goal of our program is to provide the scientific basis for the prevention of occupational lung disorders. Specific aims are to establish, whenever possible, causal relationships between environmental conditions and a definable biologic response, dose-response relationships, and threshold levels of exposure below which the adverse effect does not occur. As an independent university-based research unit, our work is in large part supported through competitive federal funding mechanisms, including the NIH and NIOSH. Published results of our investigations are available for peer review in the scientific literature. Because of the appropriate interest of responsible industry in protecting the health of their workers, a portion of our research activities has also been funded from industry sources. Our investigative interest in the health effects of asbestos exposure dates back approximately six years with a significant portion of this research having been accomplished with the collaboration of the Medical Research Council Pneumoconiosis Unit in Britain.

I would like to make clear my role in submitting these comments on the proposed new standard for occupational exposure to asbestos. I was asked to prepare an objective, scientific assessment of the literature cited by OSHA in support of its proposed standard change by the Asbestos Information Association of North America. I accepted this consultative task because I firmly believe that industry, in order to meet its occupational health responsibilities, must have available to them outside advice from academic and other sources. It is my objective in the following discussion to provide scientifically-based and dispassionate judgments on the issues raised and in no way assume an advocacy or adversary position.

There should be no doubt or confusion concerning the reasons or indeed justification for the setting of occupational health standards by regulatory agencies: these standards are set to protect workers exposed to environmental hazards in the work place. The standard-setting process should begin with a scientific data base providing quantitative information on the relationship between the environmental exposures and any associated health effects. Without data for both sides of this equation for a particular health hazard, resulting information is incomplete in terms of the important function of setting standards for safe levels of occupational exposures. Although these requirements have now been recognized by both government and non-governmental scientists, the fund of hard data of this type which is

available is clearly limited. This deficiency does not, of course, justify delay in the setting of standards using the best available quantitative information, however incomplete. Nor does our limited knowledge justify abdicating the role of science which is rationally applied to the problems of occupational health. Such a negative approach may be employed to support either extreme of little or no control on the one hand and unrealistically stringent control on the other, and is self-defeating and certainly counter-productive. It is often forgotten that standards, like science, are not written in concrete and as scientific evidence provides more information on dose-response relationships, the standard setting process must be responsive by means of regulatory action in either direction. It is clearly stated in the published OSHA proposal that the lowering of the permissible level of eight-hour time-weighted average exposure to 0.5 asbestos fibers per milliliter is based upon new medical and scientific evidence which has become available since the last asbestos standard was promulgated in 1972. My subsequent remarks will focus on this "new evidence".

There should be little debate concerning the causal association between occupational exposure to asbestos dust and certain adverse health effects, including but perhaps not limited to asbestosis, bronchogenic carcinoma of the lung, mesothelioma of the pleural and peritoneal surfaces, and gastrointestinal neoplasms. Most references cited by OSHA, dating

back to 1907, do not relate to the central issue, that being at what level (if any) of exposure do such effects fail to occur. Documenting that these health effects have occurred in workers who have had years of exposure to asbestos dust without relating measurement or reasonable estimates of past exposures to these effects has been of great importance, but does not materially assist in the standard setting process. It is respectfully suggested that the great majority of the 42 references cited in the proposal must be classified in this way.

Because of the emphasis placed by the writers of this proposal on a few, mainly unpublished, recent reports, these will be reviewed in some detail. Few studies have received as much attention and imputed importance in this standard setting process than the epidemiologic investigation of a cohort of workers employed in an asbestos textile plant in the industrial midlands of England. However, it is with some dismay that our British colleagues view the current use of their data, which is in many ways incomplete, by scientists and regulatory agencies in the U.S. Certain facts seem indisputable. The initial report published by Professor Doll in 1955 demonstrated a clear excess in respiratory cancer and pulmonary fibrosis in workers who had previous exposure for 20 or more years in this plant (1A). Follow-up of mortality data published in 1968 provided evidence that workers having their initial exposure since the asbestos regulations

took effect in 1933 had a decrease in lung cancer and asbestosis mortality and even suggested that the hazard of bronchial carcinoma had been eliminated in this population (13). It was clearly stated, however, that longer follow-up was necessary and "the data are insufficient to estimate the extent of the risk which may remain". While the improved health status of the more recently exposed workers was encouraging, limited dust exposure data presented indicated that this cohort had been exposed to average levels of asbestos dust which were often higher than current U.S. or U.K. standards.

The most recent update on the mortality experience of this cohort was presented at the International Congress on Occupational Health, held in Brighton, England, in September, 1975 (30). This continued follow-up for an appropriately longer period of time revealed a modest excess of respiratory cancer in the working population first employed since 1933. Perhaps of greatest interest was that even in a sub-cohort comprising 255 men and 93 women entering the industry for the first time since 1951 and having more than 10 years exposure, five deaths from respiratory cancer were observed in individuals with more than 15 years since first exposure. The expected number would be 1.86, an excess which was statistically significant at $p = .04$. This risk was found to be greatest in those individuals having more than 20 years' exposure. Importantly, while it was indicated that major dust control measures were completed in this plant in the late 1950's, no specific

dust exposure data were presented nor were claims made in regard to the utility of these results in setting safe standards or in generating dose-response relationships between asbestos exposure and risk of developing respiratory cancer.

Because of the importance placed on this study and the recent orally presented (but not published) report, and the requirements outlined above for the scientific basis of rationally promulgated occupational health standards, I undertook a visit to this plant during the week of January 12, 1976, with the hope of obtaining specific dust exposure data during the period since 1951, with the view of correlating level of exposure to asbestos dust with the demonstrated mortality results. Exceptional cooperation by the medical director, industrial hygienist, and management of this plant resulted in their providing extensive exposure information for this cohort, which formed the basis for the following comments. Dust data between 1951 and 1960 are based on sampling using the Casella Thermal Precipitator giving particles per milliliter, and since 1961 are based on static or area sampling using the membrane filter method and providing fibers per milliliter. For the decade prior to 1961 (when fiber counts first became available), the particle counts were converted to fiber levels. Using these data, an individual exposure estimate was reconstructed for each member of the mortality cohort for the period 1951 through 1974, using yearly average data

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obtained for each job site in order to provide cumulative exposure during the total work time in this plant for all of those employees entering the industry since 1951 and having ten years or more exposure. While my purpose is to summarize and highlight relevant aspects of this information, fuller exposition of the data can be obtained by requesting direct testimony from plant officials, possibly for the hearings to be held on this proposed standard. It should also be noted that concurrent with my receipt of these data, the identical information was supplied to Dr. John Gilson, Director of the Medical Research Council Pneumoconiosis Unit in South Wales, who is concerned with the British Occupational Hygiene Society (BOHS) standard (see below) and Professor Richard Doll of the Oxford Epidemiology Unit, the author of the mortality papers.

The current U.K. chrysotile-asbestos standard was published by the Department of Employment in 1970 with the permissible continuous exposure level being 2 fibers per milliliter . For intermittent exposure up to 12 fibers per milliliter the action required by the factory inspectorate is dependent upon the level and duration of the exposure. Exposure data from the study plant clearly indicate decreasing fiber levels during the 1960's so that in many job areas in the plant dust levels after 1970 were at or near the standard of 2 fibers per ml. It is fair to state that the goal of reaching this standard is being achieved in this factory. However, fiber counts between 1961 and

1972 reveal mean values in some job areas ranging as high as 26 fibers per ml., with standard deviations close to that number, indicating that some individual counts would have to have been many times the current standard in either country. Again, it must be emphasized that in the main these very high values were obtained prior to the 1969 asbestos regulations (U.K.). However, in carding and several other job sites, more recent sampling data continued to show some average values of 4, 5 and 6 fibers per ml., with standard deviations around the mean again indicating individual fiber counts at higher levels.

Among those individuals first exposed to asbestos dust in this plant since 1951, ten have now been certified by the Pneumoconiosis Medical Panel as having asbestosis. The minimum exposure period of this group was 10 years, maximum 18 years, mean of 14 years; and the cumulative mean group exposure was 170 fiber-years per ml. All of these workers were men and entered the plant between 1951 and 1956. Their individual cumulative exposure calculations ranged from 66 to 280 fiber years per ml.

Six individuals in the cohort first employed since 1951 have died of respiratory cancer, five of these whose time from initial exposure to death was greater than 15 years. These persons were all cigarette smokers whose year of first exposure ranged from 1952 until 1956. In each of these six individuals, the average yearly exposure to asbestos while employed exceeded

4 fibers per ml. Asbestosis was indicated on the death certificate in two of these six respiratory cancer deaths, but obviously this in no way indicates the absence of histologic (or radiographic) evidence of dust-related pulmonary fibrosis in the remaining four.

While the concept of a cumulative exposure calculation is probably deficient in that it ignores the residence time of fiber in the lungs and concentration of airborne fiber, the current U.K. asbestos standard is based on the premise that a cumulative exposure of 100 fiber-years per ml. over a working lifetime constitutes an acceptable risk in terms of adverse health effects. In this regard, it should be noted that approximately one-third of the post-1951 cohort has had cumulative exposures exceeding this amount in what has been considerably less than a "working lifetime". Maintenance workers in this plant (and in the rest of the world) have had intermittent high exposures continuing to the present time. In this plant, this is documented by recent dust data obtained between carding machines grouped within an enclosure where ordinarily production workers are not stationed. Some of these fiber counts are in the 20's and 30's but with mean values generally below 10 fibers per ml.

Finally, the exposure analyses reveal an interesting group of 58 workers in the weaving department whose average exposures have usually been 2 fibers per ml. or below. Cumulative individual exposures in this

sub-population have been below 75 fiber years per ml. in workers first exposed since 1951. It is of interest that in this population, there have been no cases of certified asbestosis or lung cancer, encouraging preliminary evidence in regard to the safety of a 2 fiber per ml. average exposure.

There have been no cases of mesothelioma in the post-1951 cohort of this plant.

The conclusions to be drawn from the biologic and exposure data from this asbestos textile plant since 1951 are reasonably straightforward. It is probable that an excess risk for the development of respiratory cancer exists in the post-1951 cohort being studied by the Oxford group. The numbers are small and Professor Doll indicated to me in January, 1976, that this excess has not yet been firmly established. In addition, asbestosis has appeared in members of this cohort. In this population, asbestos exposures during the past 20 or more years have on average clearly exceeded the current 2 fibers per ml. standard and these studies in no way invalidate that standard in regard to its adequacy in protecting from asbestos-related health effects. The use of this report (30) in supporting a change from a standard (2 fiber per ml.) which has not yet become operational in the U.S. to 0.5 fibers per ml. must be considered at best invalid and at worst misleading.

Often not recognized, particularly in the U.S., is the fact that the current British asbestos standard of 2 fibers per ml. is not based on the Doll

mortality studies discussed previously. The standard is the result of a recommendation by the British Occupational Hygiene Society (BOHS) published in 1968 (10). This standard of 2 fibers per ml. for chrysotile asbestos was suggested by the BOHS subcommittee on asbestos after review of morbidity data provided by Dr. John Knox, medical director of this same British asbestos textile plant. While both clinical and radiographic information was considered in assessing the asbestosis risk, the earliest indicator of disease (upon which the standard is based primarily) is the finding of inspiratory rales on auscultation of the lungs. This standard was reviewed by the BOHS committee and their findings published in 1973 (2A). They concluded that no change in the standard should be recommended at that time but there should be continuing review. Approximately one year prior to this published review of the asbestos standard in Britain, an article authored by the current chief medical officer of this British plant, Dr. Lewinsohn, precipitated considerable controversy, primarily emanating from this side of the Atlantic (14). It was suggested that this "new information" indicated a greater prevalence of radiographic changes of asbestosis than the previous work by Dr. Knox had documented. The arguments are complex, if not confusing, but certain points should be mentioned. The experimental classification used in determining radiological change in the Lewinsohn paper results in significant differences from those published in the BOHS report. The interpretation of the observed radiological abnormal-

ities with respect to their significance to asbestosis was not attempted in the Lewinsohn paper. Equating the lowest category of radiographic change with the disease, asbestosis, is obviously of questionable merit and as previously indicated, the x-ray appearance was not the primary basis for the establishment of the BOHS standard. In view of the described dust exposure levels in this plant since 1951, the controversy concerning differences in interpretation of morbidity data is less relevant in assessing the safety of a 2 fiber per ml. average exposure standard. The BOHS subcommittee has for the past several months been reviewing the asbestos standard in the U.K. Updated dust exposure data similar to those described previously are being correlated with the various indicators of a biologic response in exposed workers, including clinical, radiographic and physiologic information. A recent meeting of this subcommittee (mid-January, 1976) failed to result in even a preliminary position concerning the asbestos standard and it appears that it will be some months before a report to the full BOHS standards committee will be completed. It is only after the BOHS committee has approved the final report that it will become generally available.

Considerable attention has also been directed toward the report of an investigation by NIOSH presented at the Conference on Occupational Carcinogenesis, New York Academy of Sciences, in March, 1975 (41). This study entitled "Morbidity and Mortality among Hard Rock Miners exposed to an

Asbestiform Mineral", has been cited by OSHA in support of their proposed change in the standard for occupational exposure to asbestos. The study purports to show that a population of miners who have been exposed to non-commercial amphibole fibers (cummingtonite, grunerite), in low concentrations and with the preponderance of fibers shorter than 5 microns in length, have experienced an excess of respiratory cancer associated with this exposure. Widespread critical comment concerning this study, its design and interpretation of results, has resulted in two major substantive revisions by the authors since the OSHA citation.

Among workers having achieved a minimum of five years underground gold mining experience by 1960, ten deaths due to malignant neoplasms of the respiratory system were observed with an expected of 2.7. Two of these tumors did not involve the lung, being classified as carcinoma of the maxillary sinus and mediastinum, locations not previously related to occupational asbestos exposure. In two additional tumors of the lung, it was not specified whether these lesions were primary or secondary in the lung. In the remaining six, a primary malignant neoplasm of the bronchus and lung was specified. The possibility must be considered that a definite excess of primary respiratory cancer in this population has not been demonstrated. Perhaps of greater importance is the fact that this population has been exposed to a number of potentially carcinogenic materials. In the early drafts of their paper, it was stated that arsenic levels of 5 to 6

micrograms per cubic meter were measured in this mine in 1974. Although the authors preclude the possibility that arsenic (a known carcinogenic material) may have played a role in any excess respiratory cancer risk, a NIOSH investigator added to the list of authors in the last draft presented a separate paper on inorganic arsenic at the same New York Academy of Sciences meeting in March with the following statement included in the published abstract of this report: "the only quantitative epidemiological study, reported in 1974, revealed a dose-response demonstrating an increased lung cancer mortality risk at arsenic concentrations above 1 microgram per cubic meter, calculated as the average occupational exposure over a 40-year work life". The conclusions of these NIOSH investigators in this same meeting seemed contradictory, and it is difficult to understand why specific reference to the arsenic levels have been deleted from the final gold mine study draft.

Two of these same NIOSH investigators have previously pointed out the pulmonary carcinogenic effect of radon daughter exposures in the uranium mining industry (3A). Dr. Wagoner also authored a paper entitled "Unusual Cancer Mortality among a Group of Underground Metal Miners" published in the New England Journal of Medicine in 1963 showing a respiratory cancer excess of a magnitude similar to that claimed in the gold mine study (4A). No etiologic factor was firmly established, although trace metals,

arsenic, and radioactivity were mentioned as possible causes for this observed mortality experience. In a 1971 monograph published jointly by the National Institute for Environmental Health Sciences (NIEHS) and NIOSH, reference is made to the underground hard rock mining experience reported in 1963 with the conclusion that although radon daughter exposure levels were low in 1958, previous exposures were probably significantly higher due to poorer ventilation in past years (5A). Certainly, this same explanation for significant radon daughter exposure levels in the past could also have been applied to the gold mine study but for some reason was not. It is also very curious that in none of the three drafts of the gold mine study was there reference to the 1963 metal mining publication although the current study claims to show excess respiratory cancer mortality which the same author had already described in metal mining more than ten years previously. The causal factors may have been different in the two mines, but this is by no means proven.

Additional confusing factors concerning the gold mine study should be noted. The initial draft contained morbidity information concerning the prevalence of radiographic changes thought to be consistent with pneumoconiosis. The final draft has dropped this aspect of the report. In the second draft of this paper, the authors state "These samples indicated an airborne silica concentration of 3.3 to 7.2 milligrams per cubic meter,

both of which exceed the TLV for silica". These airborne silica data are excluded from the last draft. This is of particular interest since the authors claim that a statistically significant excess in non-malignant respiratory disease was noted in this cohort. In the earlier draft, this excess is entirely explained by a diagnosis of "silicosis" in four of these miners. It would be difficult to associate the finding of silicosis at death with past exposures to small asbestos fibers. This subject is further confused when in the last draft the term "pneumoconiotic disease" is substituted for silicosis as the cause of death in the non-malignant respiratory disease category.

Smoking analysis, which was included in earlier drafts, is no longer present in the pre-publication or last draft. Additionally, the single paper which was presented orally at the conference was divided into two papers after the second draft, the additional paper now entitled "Asbestos Fiber Exposures in a Hard Rock Gold Mine". It describes the amphibole fiber measurements indicating an average concentration of 0.36 fibers per ml. greater than 5 micron in length, and an average total fiber concentration of 4.82 fibers per ml., with 94% of the fibers being less than 5 microns in length. The conclusions of this second paper, however, include broad statements concerning the health effects of this exposure, none of which are supported or even dealt with in the results reported in the manuscript.

It can be appreciated from the above that there is little or no evidence presented to support an association between the fibrous dust exposure in this gold mine and an excess risk for the development of respiratory cancer in a cohort of past mining employees. These workers have been exposed to a number of potential carcinogenic agents and indeed an excess mortality risk for respiratory cancer in metal mining had previously been demonstrated by the NIOSH group. The exposures to these other potential inhalants, particularly radon daughters and arsenic, have been inadequately characterized in this cohort, particularly in the last draft. Information from previous drafts suggests that at least for arsenic, the exposures may have exceeded those levels suggested separately by one of the authors to be associated with an excess respiratory cancer risk. In view of these comments, it is difficult to understand OSHA's justification for citing this study in support of its proposed asbestos standard change.

I would like to turn now to a briefer summary of the additional "new evidence" cited by OSHA in support of the proposed standard change. A cancer risk was again noted in a cohort of insulation workers being followed by Selikoff (16). This review is essentially an update of previously presented data but does not relate the mortality experience with information concerning past asbestos dust exposure. As with most of the other studies available, no information upon which numerical standards of asbestos exposure can be

based is forthcoming in this latest report presented at the International Conference on Biological Effects of Asbestos, in Lyon, France, in 1972. At this same meeting, Dr. Selikoff's group again confirmed the interaction between asbestos exposure and cigarette smoking and the risk of developing carcinoma of the lung (20). It was suggested that this risk may also extend to asbestosis but again in the absence of exposure information, it is difficult to justify the inclusion of this report in the literature purporting to support the asbestos standard change. Also made available in the recent past is a paper reporting the presence of asbestosis, lung cancer, and mesothelioma in a cohort of workers who have had past exposure in an amosite insulation manufacturing operation (18). It is clearly stated that "no information is available concerning dust levels in this plant" and this interesting study is hardly useful in the setting of safe asbestos standards. A study of insulation workers in Belfast, published in 1971, confirmed the New York insulation experience and found excess mortality in asbestos-exposed insulators for the specific causes of lung fibrosis, lung cancer, mesothelioma, and gastro-intestinal malignancy (26). Of interest is that the lung cancer cases had associated pulmonary fibrosis (asbestosis) while those individuals who died of mesothelioma did not. This result speaks to the controversy concerning whether asbestos-related lung cancer is associated with a level of exposure which has also resulted in pulmonary fibrosis. Again, in the absence of

exposure information, this report does not help in the standard-setting process. A report by Enterline in 1972 (17) reveals that in workers engaged in the manufacture of asbestos products who have had mixed fiber exposures that maintenance men had a greater risk of developing respiratory cancer than production workers, presumably because of high intermittent exposures. It was also pointed out that men in maintenance jobs may have had a higher crocidolite exposure and that this type fiber may be more carcinogenic than chrysotile. That crocidolite exposure at similar total asbestos dust levels may be more hazardous in regard to the development of asbestosis was recently reported at the Fourth International Symposium on Particles and Vapors, in Edinburgh, in September, 1975 (6A). Little relevance to occupational standard setting is gleaned from these reports except that they suggest the possibility that, as in the U.K., there should perhaps be a different occupational standard for crocidolite fiber than there is for chrysotile.

Three reports are cited in the OSHA proposal which draw attention to the health effects associated with past employment in dockyard and shipyard workers (35, 39, 40). No dust exposure information is available in these studies and the comments made above in regard to requirements for standard-setting apply equally to these reports. Fletcher (40) suggested that a better association existed between malignancy and pleural plaques than with pulmonary fibrosis.

A number of cited references concern themselves with the association between asbestos exposure and the risk for the development of pleural or peritoneal mesothelioma (21, 22, 23, 25, 32, 33, 34, 37, 38). As no environmental dust data are reported in any of these studies, dose-response relationships can to date not be established for these malignant tumors. Considerable credit should be given to Wagner (21) for recognizing and reporting this association in 1960. These tumors have been reported in cases where the exposure had been occupational but also where contact had been in the household or in the vicinity of an industrial or mining asbestos source. It should be recognized, however, that these non-occupational sources of exposure are not necessarily low but probably of the "intermittent high level" type, perhaps similar to those exposures experienced by individuals in factory maintenance jobs. In the absence of more precise information, the demonstration of these associations does not help in setting safe levels of asbestos exposure. Certainly, there is no scientific basis for concluding that household or other non-occupational exposures have been in the range of 2 fibers per ml. or less. Newhouse and Berry (25) reported on a statistical model designed to predict future mesothelioma rates in a cohort of workers previously employed in an asbestos textile factory near London. Past exposures had been admittedly high prior to the closing of the plant in 1968. Dust levels, however, were not available and this

interesting paper presented at the Brighton meeting in late 1975 again does not help us in setting standards. Webster (32) reported a differing risk for the development of mesothelioma in South African residents in regard to two deposits of crocidolite asbestos (Cape and Transvaal). He suggests the possibility of an additional mineral in the Cape crocidolite area which had the higher mesothelioma rate but other evidence suggests that the differing structure of fibers from these two sources may prove to be the explanation for these differing biologic effects. Greenberg and Lloyd Davies (33) point out that two-thirds of their cases of mesothelioma registered by the Employment Medical Advisory Service in Britain had a recognizable past exposure to asbestos.

Two reports are cited in the proposal suggesting an association between asbestos exposure and laryngeal carcinoma (27, 28). This association, while requiring confirmation, is certainly not surprising in view of the potential for fiber deposition in the upper respiratory tract. Its relevance to the changing of an asbestos occupational standard is unclear.

Edge (42) emphasizes the presence of pleural plaques in asbestos-exposed men who ultimately developed the described health effects associated with this exposure. No quantitative environmental information is available. Anderson (15) reports radiographic abnormalities consistent with asbestos-associated effects in a group of household members of workers in the

amosite plant previously discussed. Both pleural and parenchymal changes were found but the association of these radiographic abnormalities with asbestos exposure must be studied further and the x-ray readings should be confirmed. Assuming the changes to be present, the past level and intermittency of exposure in these households is completely unknown. Considerable asbestos dust must have been brought to the homes by workers returning from a factory without significant dust control, since the same New York group of investigators have recently found evidence of significant asbestos fiber accumulation in these homes up to the present time.

An interesting and provocative paper presented at Brighton by Nicholson (19) reviews the factors involved in arriving at a threshold limit value (TLV), particularly the limitations of this approach. While this review or editorial provides stimulus for further scientific and philosophical discussion concerning the standard setting process, it does not claim to present evidence supporting the proposed change in the asbestos standard to an average of 0.5 fibers per ml. I agree with the statement in Dr. Nicholson's summary: "in the case of asbestos, current exposures can only be described crudely at any level of exposure, and health effects are only known for past high, but ill-defined, exposures." Finally, in another thoughtful paper cited by OSHA, Berry (11) stresses the importance of acceptable risk as balanced by the benefits of using the particular material

for which the standard is being considered. He uses as an illustration the promulgation of the 1968 BOHS standard of 2 fibers per ml. (10).

The remainder of the references cited in the OSHA proposal including an article by Jane Brody in the New York Times must be considered irrelevant to the current standard setting procedure and hardly requires further discussion.

Finally, it seems to me that there are two major alternatives presently available in the setting of an occupational standard for asbestos exposure. The first depends upon the premise that the adverse health effects demonstrated in workers have resulted from high but poorly quantitated levels of asbestos dust. Where such information is available, dose-response relationships have indicated that for mortality from malignant disease (7A) and for asbestosis (8A, 9A), these risks were associated with levels of exposure considerably higher than the current or proposed asbestos standards. That a working population has not had long-term exposure to even current standard levels of exposure has already been emphasized. In the absence of such epidemiologic data, one can hardly find convincing evidence on which to base present further lowering of the asbestos standard. Nor can these non-existent data invalidate the 1976 standard of 2 fibers per ml. Because no population has been available whose working lifetime exposure has averaged 2 fibers per ml., one

cannot finally conclude at this time that this level is "safe" in regard to all health effects recognized to be associated with asbestos exposure, in all exposed individuals. However, it is also impossible to state that the proposed average exposure of 0.5 fibers per ml. for a working lifetime is free of these health hazards. However, the limited information available from studies on both sides of the Atlantic, which attempt to define dose-response relationships, is encouraging in regard to a 2 fiber per ml. standard.

The other alternative depends upon the following argument. Occupational exposure to asbestos at some level has been shown to be associated with a carcinogenic risk. Since a safe threshold level of exposure cannot be scientifically proven at this time, the standard must require that all exposures be at or below the lowest technologically feasible level. The implications of this approach, vis a vis the multitude of carcinogenic materials in our environment, are far-reaching and must be faced. Those who favor this alternative must vigorously support a uniform approach and defend the resulting consequences on life in our society. I favor the first alternative as being prudent and protective of the worker's health in light of the best available current scientific information. The 2 fiber per ml. standard, which is to take effect in this country in mid-1976, has not yet become a reality in either the U.S. or U.K. This standard should be given

a reasonable trial while further epidemiologic investigation establishes its safety or lack of it. In conclusion, I wish to indicate that I am pleased to have had the opportunity to comment on the OSHA proposal for a new asbestos occupational exposure. In view of the importance attached to the most recent report on the British studies, I would like to emphasize and again draw attention to the new exposure information which I have summarized earlier in this statement. It is in light of these past exposures that the biologic data must be interpreted.

References

References with numerals only (1-42) are those cited in the OSHA proposal.

1A through 9A follow:

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