proceeding, including materials discussed or relied on in the November 1983 and April 1984 notices, the record of the informal hearing, and all written comments and exhibits received.

III. Pertinent Legal Authority

The primary purpose of the Occupational Safety and Health Act (29 U.S.C. 651 et seq.) (the Act) is to assure, so far as possible, safe and healthful working conditions for every American worker over the period of his or her working lifetime. One means prescribed by the Congress to achieve this goal is the mandate given to, and the concomitant authority vested in, the Secretary of Labor to set mandatory safety and health standards. The Congress specifically mandated that:

> The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life. Development of standards under this subsection shall be based upon research, demonstrations, experiments, and such other information as may be appropriate. In addition to the attainment of the highest degree of health and safety protection for the employee, other considerations shall be the latest available scientific data in the field, the feasibility of standards, and experience gained under this and other health and safety laws. (Section 6(b)(5))

Where appropriate, OSHA standards are required to include provisions for labels or other appropriate forms of warning to apprise employees of hazards, suitable protective equipment, exposure control procedures, monitoring and measuring of employee exposure, employee access to the results of monitoring, appropriate medical examinations, and training and education. Moreover, where a standard prescribes medical examinations or other tests, they must be available at no cost to the employee (Section 6(b)(7)). Standards may also prescribe recordkeeping requirements where necessary or appropriate for the enforcement of the Act or for developing information regarding occupational accidents and illnesses (Section 8(c)).

In vacating OSHA's revision to its benzene standard, the Supreme Court required in *Industrial Union Department, AFL–CIO* v. *American Petroleum Institute*, 448 U.S. 601, 65 L. Ed. 2d 1010, 100 S. Ct. 2844 (1980), that before the issuance of a new or revised standard pursuant to section 6(b)(5) of the Act, OSHA must make two threshold findings. OSHA must find that a significant risk exists under the current standard and that the issuance of a new standard would reduce or eliminate that risk. The Court stated:

> We agree . . . that subsection 3(8) requires the Secretary to find, as a threshold matter, that the toxic substance in question poses a significant health risk in the workplace and that a new, lower standard is therefore "reasonably necessary or appropriate to provide safe and healthful employment and places of employment." 448 U.S. 607 at 614–15; 65 L. Ed. 2d 1010 at 1018–19.

The Court also stated:

> . . . Before he can promulgate any permanent health or safety standard, the Secretary [of Labor] is required to make a threshold finding that a place of employment is unsafe—in the sense that significant risks are present and can be eliminated or lessened by a change in practices. . . . (448 U.S. at 642, 65 L. Ed. 2d at 1035)

The decision, although it recognized the uncertainties involved, indicated that the determination of "significant risk" should, if at all possible, be established on the basis of an analysis of the best available evidence through such means as quantitative risk assessments. However, in making that determination, the Supreme Court in its general guidance for the future noted that

> . . . The requirement that a "significant" risk be identified is not a mathematical straitjacket. It is the Agency's responsibility to determine, in the first instance, what it considers to be a "significant risk." (448 U.S. at 655, 65 L. Ed. 2d at 1043)

It pointed out that while OSHA

> . . . must support its findings that a certain level of risk exists by substantial evidence, we recognize that its determination that a particular level of risk is "significant" will be based largely on policy considerations. (448 U.S. at 656, 65 L. Ed. 2d at 1043, n. 62)

Finally, the Court pointed out that

> . . . OSHA is not required to support its finding that a significant risk exists with anything approaching scientific certainty.
>
> Although the Agency's findings must be supported by substantial evidence . . . OSHA [has] some leeway where its findings must be made on the frontiers of scientific knowledge. (448 U.S. at 656, 65 L. Ed. 2d at 1043)

In the only concrete example of significance, the Court stated:

> Some risks are plainly acceptable and others are plainly unacceptable. If, for example, the odds are one in a billion that a person will die from cancer by taking a drink of chlorinated water, the risk clearly could not be considered significant. On the other hand, if the odds are one in a thousand that regular inhalation of gasoline vapors that are 2% benzene will be fatal, a reasonable person might well consider the risk significant and take appropriate steps to decrease or eliminate it. (Id. at 655, 658 L. Ed. 2d at 1043.)

After OSHA has determined that a significant risk exists and that such risk can be reduced or eliminated by the proposed standard, it must set the standard "which most adequately assures, to the extent feasible on the basis of the best available evidence, that no employees will suffer material impairment of health . . ." (section 6(b)(5) of the Act). The Supreme Court has interpreted this section to mean that OSHA must enact the most protective standard possible to eliminate a significant risk of material health impairment, subject only to the constraints of technological and economic feasibility. (*American Textile Manufacturers Institute, Inc.* v. *Donovan*, 452 U.S. 490 (1981)).

Moreover, section 4(b)(2) of the Act provides for OSHA standards to apply to construction, maritime, and other workplaces where the Secretary determines that these standards are more effective than the existing standards that would otherwise apply to these workplaces. The Secretary so finds, and these standards will therefore apply to all workplaces where the Secretary has authority to regulate.

IV. Health Effects

A. Overview of Asbestos-Related Diseases

OSHA is aware of no instance in which exposure to a toxic substance has more clearly demonstrated detrimental health effects on humans than has asbestos exposure. The diseases caused by asbestos exposure are life-threatening or disabling. Among these diseases are lung cancer, cancer of the mesothelial lining of the pleura and peritoneum, asbestosis, and gastrointestinal cancer. Of all of the diseases caused by asbestos, lung cancer constitutes the greatest health risk for American asbestos workers. Lung cancer has been responsible for more than half of the excess mortality from asbestos exposure in some occupational cohorts.

The relationship between lung cancer and asbestos exposure has been established in numerous epidemiologic studies of diverse groups. Asbestos-induced lung cancer usually has a latency period in excess of 20 years, and this cancer may be manifested at a younger age than is true for lung cancer victims who are not exposed to asbestos (Craighead et al., Ex. 84–033). Few cases of lung cancer are curable, despite advances in medical and surgical

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