NIOSH

Testimony to DOL

STATEMENT OF
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AT THE
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
U.S. DEPARTMENT OF LABOR
PUBLIC HEARING

ON
PROPOSED STANDARD FOR COKE OVEN EMISSIONS
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16. Abstract (Limit: 200 words)
The speaker testified that a total weight of particulate from a worker's breathing zone sample would best serve as a screening device for workplace evaluation of exposure to coke oven emissions. It was recommended that an interim exposure level for total particulates be set at 0.5 to 0.7mg/m3. When test results exceed this limit, a benzene soluble fraction should be analyzed, using the existing 0.2mg/m3 standard. Weight was given to findings that coke oven emissions were carcinogenic as were several polynuclear aromatic compounds produced by coking of coal. The recommendations also called for the benzo(a)pyrene (50328) content of the respirable particulate fraction to be analyzed twice yearly as an index for carcinogenic properties of this fraction. While it was acknowledged as difficult to determine which etiologic agent or agents would be most appropriately monitored, as the agents which cause the various types of cancer were unknown, consideration of the screening level based on total particulates, backed up by the benzene soluble standard as it currently existed, was recommended. Specific changes in standards included: extending medical surveillance to include maintenance workers; extending initial examinations to include urinary and skin symptoms such as bloody urine and skin photosensitization; extending pulmonary function tests to include forced expiratory volume in 1 second; and extending skin examinations for premalignant and malignant lesions and evidence of hyperpigmentation.

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I am Edward J. Baier, Deputy Director of the National Institute for Occupational Safety and Health (NIOSH). With me are Dr. J. William Lloyd, Director of the Office of Occupational Health Surveillance and Biometrics; Dr. Elliott S. Harris, Director of the Division of Laboratories and Criteria Development and Mr. John M. Bryant, Deputy Director of that Division; Mr. Paul E. Caplan, Deputy Director of the Division of Technical Services; Dr. Hector Blejer, Deputy Director of the Division of Field Studies and Clinical Investigations; and Mr. Vernon E. Rose, Director of the Office of Research and Standards Development.

I appreciate the opportunity to summarize the NIOSH position regarding a standard for coke oven emissions. Following this statement we will all be available to answer any questions or to provide comments on items bearing on the subject of this hearing.

On February 28, 1973, NIOSH submitted its "Criteria for a Recommended Standard....Occupational Exposure to Coke Oven Emissions" to the Department of Labor. This document contained recommendations for a workplace standard together with relevant background data. In essence, the criteria document contained recommendations for periodic medical examinations, work practices and the use of personal protective devices. No environmental limit was proposed, because, we believe there were not sufficient data to determine a safe level, and the recommendations were provided to supplement, rather than supplant,

the existing Occupational Safety and Health Administration's (OSHA) standard as contained in Part 1910, as published in the Federal Register.

Following a report from the OSHA Advisory Committee, at which Dr. Lloyd participated as the NIOSH representative, OSHA published its proposed standard in the Federal Register, July 31, 1975. The NIOSH comments are based on this proposed standard.

NIOSH does not concur with a respirable mass concept. "Respirable particulates" is defined in the proposed standard, but is not spelled out in the "permissible exposure limit" specified. We assume this was the intent, however.

The respirable fraction of particulates may be significant in effecting damage to the lower portion of the respiratory tree, including the alveoli. The larger particulates, which also, and possibly more effectively, absorb the polynuclear aromatic compounds, may adversely affect the upper respiratory tract, be ingested or be deposited on the skin producing systemic and/or dermal responses. Furthermore, since the "total size fraction" sample is invariably greater in weight than the "respirable size fraction," its analysis is proportionately easier to perform, less expensive to carry out and more conducive to greater accuracy. From a sampling point of view, the "total size fraction" sampling device, the 3-piece plastic cassette, is less expensive and less complicated than the "respirable size fraction" sampling device, namely the 3-piece cassette plus the cyclone separator. Furthermore, some tests indicate that it is less dependent on the proper orientation of the sampling system.

From a technical point of view, the concept of "respirable size fraction" and "respirable sampling," were designed originally and tested to relate to inorganic, silicosis-producing dusts only. Their relevance for sampling and analysis of other types of particulates, such as organic, potentially carcinogenic compounds, has not yet been tested or demonstrated.

NIOSH believes that a total weight of particulate from a sample taken in the breathing zone of exposed workers would serve as the best practical screening device for evaluating exposure. NIOSH further recommends that an interim exposure level for total particulates be set at 0.5 to 0.7 mg/M^3. If the compliance officer's or employer's tests exceed this level, the sample could be analyzed for the benzene soluble fraction, utilizing the existing 0.2 milligram per cubic meter of air (0.2 mg/M^3) standard.

The proposed standard is based on the carcinogenic properties of Coke Oven Emissions and the known carcinogenicity in animals to the several polynuclear aromatic compounds (PNA) produced by coking of coal and their quantitative correlation to the respirable fraction. The proposed standard does not address itself to this relationship. Also, Benzo(a)pyrene (BaP), a carcinogenic PNA Compound, is to be analyzed semi-annually as an index for evaluation of the carcinogenic properties of the respirable particulate fraction. Without a number value it will be a meaningless exercise, except as it would indicate

the trend of exposures to a known carcinogen. If this is the goal, it should be so stated.

Ideally, in addition to total particulates, "benzene solubles" and BaP or some other indicator should be used as an index of exposure, but the etiologic agent or agents which cause the various types of cancer is unknown. It is difficult to state, with any degree of certainty, which is most appropriate. Nevertheless, for regulatory purposes, we propose consideration of the screening level based on total particulates, backed up by the benzene solubles standard as it currently exists. Measurements for BaP could then be required to evaluate trends in control.

Regarding medical requirements, we propose the following specific changes (underlined) as stated in the proposed standards (page 32279):

(j) Medical surveillance

(1) General requirements

Each employer shall institute a medical surveillance program for all employees <u>including maintenance workers</u> who work in regulated areas at least 30 days per year.

(2) Initial examinations

(i) A work history and a comprehensive medical history which shall include the presence and degree of respiratory, <u>urinary and skin symptoms</u>, i.e., breathlessness, cough, sputum production, wheezing, <u>bloody urine and skin photosensitization</u>.

(b) Pulmonary function tests to include forced expiratory volume in one second (FEV_1) and forced vital capacity (FVC) with recording of the equipment used; and

(d) A skin examination for premalignant and malignant lesions and evidence of hyperpigmentation and photosensitivity.

(e) Urinalysis for sugar, albumin and microscopic tests for red blood cells.

(4) Alternative medical examinations

(i) Obtains a statement from the examining physician setting forth the alternative medical examinations and the rationale for their substitution and submits such statement to the Secretary for approval as to the medical acceptability of such alternative examinations; and....

If there are any questions, we will be pleased to answer them.

Addendum to NIOSH Statement:

Yesterday afternoon we met to discuss the proceedings. We observed that this hearing differed significantly from previous OSHA hearings in that the affected employers and the affected employees were represented, at least in part, by professional industrial hygienists. Not only professionals, but by leaders in the profession. There are less than 1,000 persons who have become board certified in this field in the world. Yet, practically all industrial hygienists present here yesterday were Board certified. In fact, the Chairman of the Certifying Board was here and asked questions. Three members of the American Industrial Hygiene Association Board of Directors were here as were Past-Presidents and former Directors of that Association. The Companys have physicians who are Board Certified in occupational medicine. This is far different, because these talents are NOT available to most persons affected by OSHA standards in other areas.

Yet, the debate so far has centered on "numbers," numbers with statistical coefficients of variance, though. Cancers have been demonstrated in exposed workers. It's our job here to prevent this in the future. Perhaps we should forget numbers and develop a checklist of "Thou Shalts" such as thou shalt have air-conditioned cabs on larry cars, thou shalt have air-conditioned pulpits, etc. Perhaps Appendix B of the proposed standard should BE the standard.