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Comments to be presented at 11/29/77 public meeting on approval requirements for respiratory protective devices

My name is Robert Mahon, I am Chief of the Protective Equipment Section of the National Institute for Occupational Safety and Health. The protective Equipment Section is located at 5555 Ridge Avenue, Cincinnati, Ohio.

My initial comments will be directed at the present status of three areas of 30 CFR 11 revision. These are areas being addressed by the National Institute for Occupational Safety and Health in its quest to provide the worker with better respiratory protection.

The first area is Subpart K - Dust, Fume and Mist Respirators. A major proposed revision relates to fit testing requirements and is largely based on research sponsored by NIOSH and performed by Los Alamos Scientific Laboratories (LASL). LASL personnel will be commenting on these proposed changes and the basis for recommending them. The NIOSH Division of Safety Research is currently drafting the amendments.

The second area pertains to single-use vinyl chloride respirators. The final amendments have been approved by the Secretary of Health, Education and Welfare and submitted to the Secretary of the Interior.

The third pertains to the approval of separate gas cylinders and valve assemblies for self-contained breathing apparatus. A public meeting was held on October 22, 1976 to obtain information and views on engineering feasibility, benefits, legalities and liabilities associated with the proposed amendments. The feasibility of approving component parts separately was concluded by NIOSH. An amended regulation has been submitted to the HEW General Counsel.

At this time I would like to discuss another area that should be of considerable interest to this group, NIOSH's Respirator Research Program, which is the responsibility of the Division of Physical Sciences and Engineering. The Protective Equipment Section is a part of that Division.

Prior to FY 75 respirator research by the NIOSH was performed largely by contract. Continuing development of in-house laboratory capability has enabled direct response to research needs and a balanced in-house/contractual effort in the development of testing and performance requirements for respirators. Working with me on this project and present today are Dr. Eugene Kennedy and Mr. David Smith.

What has the NIOSH been doing recently in respirator research? In FY 77 the NIOSH supported the following projects related to respirator research:

First, pesticide respirator evaluation

The purpose of this project was to evaluate the NIOSH certification test procedure for pesticide respirators. (A part of the project involved the in-house evaluation of the effectiveness of the testing procedure). Commercial pesticide respirators were tested using pesticides and fumigants. Included in the evaluation were sulfuryl fluoride, dimethyl dichlorovinylphosphate, methyl parathion, and dibromochloropropane. Dr. Kennedy reported some of the results at a recent NIOSH meeting on DBCP. The final report will be available by the end of FY 78.

A second project involves end-of-service-life indicators

A contract was let to develop a prototype respirator sorbent end-of-service-life indicator. The prototype devices will be delivered in late December or January along with a final report. In-house evaluation of the

device, including laboratory and field studies, will take place during FY 78.

A third involves the development of improved approval test methods for sorbents used for organic vapors

Through a joint effort with NASA, the NIOSH began work to upgrade the requirements of 30 CFR 11 Subpart L, bench test methods for organic vapor respirator cartridges in FY 75. This research is summarized in NIOSH Publication No. 77-209. Recommendations for a new test method and further research have influenced current research. We plan to submit our recommendations to the Testing and Certification Branch in FY 79.

A fourth involves the development of particulate filter service life test methods

Through an interagency agreement with ERDA, we have been exploring new methodologies for testing respirator particulate filter elements. In FY 77 LASL conducted research to develop a sodium chloride loading test for particulate respirator filters and conducted an interlaboratory study of initial filter penetration using a sodium chloride aerosol. LASL will be commenting on this research.

A fifth involves the development of improved fit test methods for gas and vapor respirators and powered air-purifying respirators

Also via an interagency agreement with ERDA in FY 77, NIOSH has sponsored development of quantitative fit test methods for gas and vapor air purifying respirators and for powered air-purifying respirators. The annual reports on work sponsored by NIOSH at LASL are usually available in March.

A sixth involves the field evaluation effectiveness of respirator filters and solvents against coke oven emissions and copper smelter contaminants

We conducted studies of the efficiency of respirator filters and sorbents in removing contaminants found in copper smelters and over the top of coke ovens. The results of these studies will be submitted to the AIHA Journal in December.

A seventh involves paint respirator test method development

A contract was completed to evaluate the current approval test method for paint spray respirators. The final report is being revised for publication. This should be completed by March 1978. The recommended procedure will be validated in-house.

An eighth involves evaluation of sorbents against solvents used in surface coating and degreasing operations

A contract study was completed to determine service life against several solvents at varying test concentrations, flow rates and humidities. The final report is being reviewed prior to its being published as a NIOSH document.

The ninth involves protective clothing material performance criteria and tests

The purpose of this project was to develop performance criteria, recommend performance tests and develop a permeation test for protective clothing against liquid carcinogens. Ten carcinogenic liquids were used in the study and ten types of protective clothing materials were evaluated. The final report will be received by November 30, 1977 and submitted for publication as a NIOSH report by April 1, 1978.

During FY 77 we held several meetings with OSHA personnel to identify their respirator research needs. We also obtained inputs from the Division of Safety Research, other research groups such as LASL and LLL. Valuable suggestions were also made by manufacturers, trade association and organized labor representatives.

Five of the major respirator research projects we are addressing in FY 78 are:

The first involves the in-house development of improved respirator test and performance criteria including the evaluation of existing gas and vapor respirator test methods. In-house activity in this project will also include the modification of the paint respirator test apparatus and revision of the analytical approach. A revised paint respirator test method will be submitted to TCB in FY 78.

The second involves evaluation and development of respirator equipment. We will perform laboratory and field evaluations of the prototype end-of-service-life indicator developed by contract. We will conduct an in-house and extramural evaluation and development of SCBA test methods and performance requirements.

The third involves evaluation of respiratory protection for coal cleaning system personnel.

The fourth involves developing respiratory protection for personnel exposed to carcinogens. We will perform an in-house evaluation of sorbents and filters used to protect personnel exposed to carcinogens.

The fifth project also involves work with carcinogens.

We will be developing performance criteria on the permeability of such materials as: Natural rubber latex, urethane, neoprene and butyl rubber when exposed to carcinogens or suspected carcinogens.

Research activity associated with projects four and five cannot proceed too far until we have access to our new carcinogen lab. We expect it to be operational by March 1978.

I wish to conclude my remarks by saying that Dr. Kennedy, Mr. Smith and I expect to be here through the remainder of the meeting. Your questions and suggestions are welcome.

We are interested in learning about any other respirator research currently underway as well as needs not presently being addressed.