

## WORK PRACTICES

WILLIAM TODD

**MR. BAIER:**

Bob referred several times to work practices. To give you some overview of work practices, we have William Todd:

**MR. TODD:**

Thank you, Ed. I'm employed in the Protective Equipment Section of the Control Technology Research Branch; what I will have to say will deal generally with work practices, but my viewpoint is from that of personal protective equipment.

I reiterate that the NIOSH role is to perform research. We provide input into the development of criteria documents. We also provide technical information for the solution of occupational safety and health problems.

The OSHA Act states a priority in the use of control methods. First priority is given to engineering controls, which Bob Hughes has just addressed himself to. His section deals with the cause and how to engineer the cause out of the process or how to control the hazardous material or materials in the process.

Second in priority is sub-part G of the OSHA regulations which refers to administrative controls, that is, not allowing the workers to be exposed to harmful levels beyond the recommended exposure limits. For example, scheduling worker time in high toxic level areas so as to limit his exposure.

Third priority is the use of personal protective equipment.

So, the user would resort to personal protective equipment only if he cannot solve the problem by the first and second method that is by engineering controls or by administrative controls.

I would like to note that the success of personal protective equipment depends upon the coop-

eration of the worker; something that we in NIOSH recognize as a factor in measuring the effectiveness of personal protective equipment. The workers must use the equipment or it does them no good. This we also recognize as a management problem so this approach to protecting the worker loops back into administrative controls. Management must then take adequate measures to see that personal protective equipment is used and that proper procedures are followed.

What I have to say deals with what our Protective Equipment Section is doing or plans to do in the area of personal protective equipment research.

We have two projects which relate to problems in the rubber workers industry. Adsorption capacity studies are planned both in-house and by contract. These projects are proposed at this time for chemical compounds used in the rubber industry which are known to be harmful and volatile enough to cause concentrations in work areas above the TLV.

Respirator adsorbent cartridges used against chemical vapors are currently certified by a test method using carbon tetrachloride as the assault substance. This testing is done at the NIOSH Testing Certification Laboratory in Morgantown, West Virginia. It has been demonstrated that there is a wide range of capacity that a cartridge adsorbent such as charcoal has for different chemical vapors. This was manifested in work done on vinyl chloride when it was found that the typical activated carbon charged in a canister adsorbed only about one-tenth of the vinyl chloride that could be expected based upon the carbon tetrachloride certification test. This meant that most cartridges would not provide adequate service life to protect the worker.

We realize now that the only way we can be certain that a respirator adsorbent will provide adequate capacity is to test that adsorbent

against the particular chemical species. This is what we are intending to do, not only in the case of chemicals used in the rubber industry (this is a project which is proposed at this time), but also in other industries.

It will take a long time to do this but it's the only way to determine exactly what the adsorbent capacity is.

In another study, a contract is being let to develop performance criteria for protective clothing. Special attention is being given to several carcinogenic substances and, also, to the mechanism by which carcinogenic liquids pass through the protective clothing barrier. We must be able to define and measure how these materials will pass through or permeate through the protective clothing barrier and contact the wearers' skin.

In addition to the two projects I just mentioned, the Protective Equipment Section is responsible for input to criteria documents related to personal protective equipment. The following is a format recommended for review of criteria documents which is comparable to the criteria document format currently used for respirators. For example, with protective clothing — the items considered as input for criteria documents are conditions and work situations under which specific types of protective clothing must be worn; employer-employee responsibilities; required standard operating procedures; identification requirements for types of protective clothing; maintenance and storage requirements; training employees in proper procedures; eye and face protection requirements; need for full body impervious suits; emergency procedures; and a wearing time limitation for working conditions and substance exposures.

The Protective Equipment Section also has input to criteria documents for respiratory protection. We review criteria documents for specific working conditions and substance exposures under which respirators must be worn; employer-employees responsibilities; respiratory protection program requirements such as training, maintenance and program management. In addition to these items just mentioned, our research group will review the use of approved respirators, emergencies, and time of wearing limitations.

In developing recommended standards or performance criteria for a substance, NIOSH considers the basis for the recommendation of the use of personal protective equipment. The rationale for the selection and the use of personal protective equipment would include:

First, a decision logic similar to that used in the standards completion program for the selection of respirators and protective clothing.

Second, the documentation of pertinent toxicological information which was used in the selection of personal protective equipment. Information on such factors as wearer acceptance, warning properties, chemical properties and the concentrations dangerous to life and health would be reviewed. The rationale for using such information would also be provided.

Third, the documentation of the limitations of various types of personal protective equipment. For example; heat stress, adsorbent capacity for individual materials; permeation of chemicals through the protective clothing and the durability of the protective clothing.

Fourth and last, references to pertinent information sources.

# Proceedings of NIOSH STYRENE-BUTADIENE BRIEFING

Covington, Kentucky  
April 30, 1976

General Chairman — J. William Lloyd, Sc.D.  
Conference Coordinator — Barbara S. Woolf, M.S.  
Office of Extramural Coordination and Special Projects

Proceedings Editor — Lorice Ede, J.D.  
Division of Technical Services

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Public Health Service  
Center for Disease Control  
National Institute for Occupational Safety and Health  
Cincinnati, Ohio  
December 1976

## **DISCLAIMER**

The report of the official recorder of the proceedings is presented as edited by the participants and expanded to include reference material. The opinions, findings, and conclusions expressed are those of the speakers and not necessarily those of the National Institute for Occupational Safety and Health.

Mention of company name or product does not constitute endorsement by the National Institute for Occupational Safety and Health.

HEW PUBLICATION NO. (NIOSH) **77-129**