

ARPED

Association for Respiratory Protective Escape Devices

94-064
1-8755 Ash Street
Vancouver, B.C.,
Canada V6P 6T3
Tel: (604) 324-3822
Fax: (604) 324-3821

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NIOSH Docket Office,
Robert A. Taft Laboratories,
Mail Stop C34,
4676 Columbia Parkway,
Cincinnati,
Ohio 45226,
USA.

Dear Sirs:

**RE: PUBLIC COMMENT ON THE NOTICE OF PROPOSED RULEMAKING
FOR 42 CFR PART 84 - RESPIRATORY PROTECTIVE DEVICES
- FEDERAL REGISTER VOLUME 59, NO 99, MAY 24, 1994.**

On behalf of the members of the Association for Respiratory Protective Escape Devices ("ARPED") I wish to submit the following comments on the above-referenced Notice of Proposed Rulemaking regarding the scope and applicability of the proposed rule modifications to a major and still largely under-appreciated hazard in our society, namely the unnecessarily severe injury levels and death rates associated with the inhalation of smoke from unwanted fires.

In short, the following comments postulate the need for the scope of 42 CFR 84 to be expanded to provide test and performance criteria for respiratory protective escape devices ("RPEs") that provide civilians (workers and members of the general public) with personal respiratory protection while they escape from the fireground.

Well-established summary statistics present a compelling case that smoke is by far the most important agent causing injury and death from fire in North America: over 75% of the 5,000 deaths and 60,000 serious injuries that result annually from North America's unwanted fires are caused, in whole or in part, by smoke inhalation; these smoke inhalation-related deaths and injuries are now driving, in both the U.S. and Canada, our national fire-related human loss records, which are among the worst in the industrialized world.

The fire smoke problem is just as severe, but not as frequent, in the context of occupational safety as it is for the general public housed in residential occupancies. Approximately 1,000 North Americans in occupational settings die annually from smoke inhalation. A further 12,000 suffer serious respiratory injuries. In February 1993 the World Trade Center bombing in New York injured 1,000 unprotected office workers. Most of their injuries were due to toxic smoke inhalation. While this incident was spectacular in its scope, similar incidents produce similar results on a smaller scale every day in an occupational setting somewhere in North America.

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ARPED believes that it is incumbent upon NIOSH in its standards setting role, and of OSHA through its enforcement mandate, to deal with the occupational hazards of fire. There has been no attempt within NIOSH to develop test and performance standards for appropriate RPEDs (due to their weight, bulk, training and maintenance requirements, SCBAs are not considered "appropriate RPEDs" for the contemplated need) designed to provide short term emergency protection against the effects of fire smoke resulting from unwanted fire in the workplace.

There is no overriding technical reason why NIOSH cannot address this oversight, although the nature of existing regulations, especially those governing air-purifying particulate (DFM) and escape-only types of respirators is such that up to now a rational technical design basis has not been possible.

Existing test protocols are not conducive to the proper engineering evaluation of respirator performance characteristics, particularly under conditions of use other than the strict conditions of the test. Not only has there been concern, therefore, about the effectiveness in use of some currently certified particulate filter respirators, but it has been impossible to extrapolate their performance characteristics to any reasonable degree.

The proposed change from specified DFM testing to a certification program based on particle size characteristics is a monumental step in the right direction; that is, an engineering-based system for evaluating air-purifying respirator performance. One major advantage of the proposed approach is its ability to assess performance against well-characterized generic particulate hazards, including particulate size ranges commonly found in fire smoke. As has been pointed out in the proposed modifications, since the tests are to be designed so that the penetration rate for ambient particulates (regardless of composition) will not exceed that of test particulates, this approach eliminates the need to test and classify filter performance according to the composition of the contaminant.

Although the proposed modifications were not necessarily developed for use outside of mining and general industry, we are aware that they are expected to be of particular value in addressing the significant potential health hazard posed by Mycobacterium tuberculosis-bearing aerosols in occupancies such as health care facilities. Respiratory protective performance criteria established for this purpose by the Center for Disease Control are directly addressed by the proposed modifications.

We believe that relevant performance criteria for protection against fire smoke particulates can be developed and structured in a similar manner and will be directly addressed by these same modifications.

The existing NIOSH mandate for worker respiratory protection, up until now under the jurisdiction of the Department of Labor, is admittedly a poor fit for regulating hazards confronted by the general public. However, ARPED believes that the responsibility for developing standards for testing and certification of RPEDs for general public use properly falls within the jurisdiction of the Center for Disease Control and Prevention of the U.S. Public Health Service. However, certain anomalies, in the basic descriptive language of the regulations, inhibit the development of appropriate test and performance standards in this important area.

Specifically, the current and proposed descriptive bases for all certifiable particulate air-purifying filters include requirements for protection against atmospheres that contain adequate oxygen to support life and are contaminated with particulates not IDLH (proposed Section 84.170). The former requirement is consistent with the essentially uncompromised oxygen content of fire smoke atmospheres encountered at any point along a viable escape path. The latter requirement is breached by many fire smoke atmospheres which may be characterized by high concentrations of particulate matter that are extremely IDLH. This situation would not be dissimilar to that potentially found in health care facilities where dangerously high levels of Mycobacterium tuberculosis can be found. In fact, it may be argued that no measurable level of Mycobacterium tuberculosis should be considered below IDLH.

Recent large scale epidemiological studies on the health effects of particulate air pollution demonstrate clearly that significant negative health effects accrue from surprisingly low particulate concentrations and that these effects increase predictably with pollutant concentration over several orders of magnitude. Even exposure levels previously considered safe are capable of causing low-level, chronic ill effects which can generate irreversible impairment of respiratory function. Unlike gases and vapors whose physiological and toxicological effects are typically more readily quantified and understood, the concept of IDLH is arguably not appropriate for a great many if not all particulate irritants.

The long term negative effects that afflict some people after relatively brief exposures to certain substances (such as airborne asbestos) are cases in point. No reasonable IDLH values can be set for such exposures. Should this observation lead one to argue, therefore, that respiratory protective standards should not be set or that performance criteria cannot be properly established for air-purifying type respiratory protective devices? If so, then it may be argued further that there is no place for RPEDs in any regulatory context.

ARPED does not hold such a view because it does not recognize the improved capability of current air-purifying filter technology. Nor does this view acknowledge the urgent and demonstrated need for simple and effective RPEDs as aids to escape from fire smoke and many related acute atmospheric threats.

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Short term occupational exposure to smoke is, in fact, a scenario that is explicitly contemplated in the proposed section 84.170. In many real-world situations, however, a contradiction arises between the use requirement not to exceed IDLH concentrations and the known danger of short duration exposures coupled with high concentrations of particulates. Yet, the utility of air-purifying respiratory protective devices for short-term use against acute exposures (not for use in firefighting) has been well-documented. There is a need, where justified, to remove this unnecessary restriction to non-IDLH atmospheres and to develop suitable performance and test standards for RPEDs intended for use as emergency escape aids against fire smoke and related hazards.

In summary, there is an obvious need for reliable, well-engineered and user-friendly RPEDs to facilitate peoples' rapid escape from fire smoke. A significant portion of the use potential for this type of device would fall necessarily within the occupational context, but as there is typically little distinction between gross fire hazards in or outside the workplace, there is little justification for identifying fire hazards in occupational settings as generically different from, or in some way more deserving of regulatory attention than, fire hazards in residential occupancies.

The transfer of nominal regulatory responsibility for Respiratory Protective Devices from the Department of Labor (Title 30) to the Public Health Service (Title 42) establishes the appropriate format and context for general public health regulatory measures to be brought to bear now to address this hitherto neglected area of concern which has caused unacceptably high human losses in North America.

To improve North America's human fire loss record, the fire survival process must focus on its root cause: smoke inhalation. To evoke this focus we urge NIOSH to expand the present scope of proposed Rule making for 42 CFR Part 84 to include devices whose purpose is to provide workers and the general public with personal respiratory protection while they escape from the fireground. This re-thinking is imperative for high-risk groups including children, the elderly and disabled North Americans.

ARPED contemplates that these devices will be used in combination with established and cost-effective fire protection measures such as detection, suppression and fire resistive construction. Used appropriately, RPEDs offer an additional weapon in the arsenal of protective measures against products of combustion.

Yours sincerely,
**ASSOCIATION FOR RESPIRATORY
 PROTECTIVE ESCAPE DEVICES**

per: 
 Roger Killen - President.