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NATIONAL FIRE PROTECTION ASSOCIATION
INTERNATIONAL

January 24, 1978

Mr. Robert H. Schutz
Chief, Testing and Certification Branch
Division of Safety Research
National Institute for Occupational
Safety and Health
944 Chestnut Ridge Road
Morgantown, WV 26505

Dear Mr. Schutz:

In response to the request for comments regarding 30 code of Federal Regulations, Part II, the NFPA is pleased to submit the attached paper for consideration by NIOSH and MESA. We feel that there is room for significant improvement in the type of equipment now being authorized for use by the fire service. Hopefully, our position on this matter, along with that of other fire service organizations that have submitted comments, will offer substantial guidelines to NIOSH and MESA while concurrently emphasizing the need to proceed with due haste.

With the very able assistance of NIOSH and MESA representatives, NFPA will be working to develop a performance standard for self-contained breathing apparatus intended for fire service use. We are hopeful that the finished document will provide a useful standard against which NIOSH can test and certify equipment.

Again, we are pleased to submit this document and will be looking forward to working on this important project.

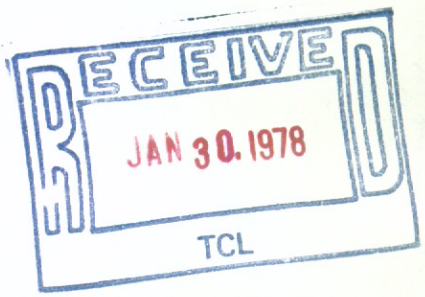
Sincerely,

Joseph M. Redden

Joseph M. Redden
Division Director
Public Protection Division

JMR:paa

cc: Charles S. Morgan
Robert W. Grant
Anthony R. O'Neill
Martin E. Grimes



RESPONSE BY THE NATIONAL FIRE PROTECTION ASSOCIATION TO REQUEST FOR COMMENTS REGARDING 30CFR-11 AS PUBLISHED IN THE FEDERAL REGISTER ON OCTOBER 28, 1977 PAGE 56805 ITEM 4110-87

The National Fire Protection Association is a voluntary non-profit organization, international inscope, whose sole purpose is to advance by science and education the protection of lives and property from fire. Membership in the Association now numbers approximately 32,000 organizations, institutions, and individuals. Public fire departments make up the largest single segment of the membership numbering approximately 25 percent.

Through our Protective Equipment for Fire Fighters Committee, the NFPA will be developing performance standards for self-contained breathing apparatus (SCBA's) intended for use in the fire service. The Committee membership represents a broad spectrum of fire service personnel, researchers, manufacturers, and regulating interests that together will develop a performance standard designed to deal with the medical and economical considerations at hand.

We would strongly urge NIOSH and MESA to assist our Committees in developing a performance standard against which NIOSH can test SCBA's for fire service use specifically. We firmly believe that only the fire service community can generate a performance standard for equipment that is such an important part of the fire fighters' personal protection. Experience gained through the use and abuse of this equipment along with the research efforts of organizations such as NASA, Lawrence Livermore Laboratories, Los Alamos Scientific Laboratories, Harvard University, and others, will allow the Committee to access a wealth of current information. We urge your continued vigorous support of research and of this important performance standard project.

The NFPA, and especially its fire service members, are vitally interested in the revision of 30 Code of Federal Regulations, Part 11. Accordingly, the following comments are offered regarding this matter.

1. Performance and testing criteria for SCBA should be specifically designed for fire service applications. The present criteria which is multi-industry does not speak to a significant number of conditions or problems that are common to the fire service. Among the areas that are not properly examined by the existing tests are:

A. The resistance of all components of SCBA's to rapid and dynamic changes in temperature during fire fighting situations, and where water is generally involved. There have been documented incidents where fire fighters have been subjected to severe hazards by virtue of the face piece lens cracking, valves freezing, or regulators malfunctioning when the apparatus is subjected to temperature changes that are normally encountered on the fireground in the northern portion of the United States. Realistically, the SCBA's must be able to withstand temperatures from approximately 40°F below zero to

approximately 250$^{0}$F. In addition, water spray from fire fighting situations often collects and freezes to a significant thickness on the apparatus. Any testing standard that is designed to simulate fireground conditions, should also take into consideration the extended periods of time that the apparatus is exposed to severe cold and/or heat.

B. The inability of the universal face piece to provide a tight seal on all individuals and under impact conditions. Many problems associated with SCBA's are directly traceable to the lack of a tight fit on a fire fighter's face. Future standards must take into consideration the fact that not all facial bone, skin, or hair configurations can be served by one universal face piece. Additionally, the problem of a face piece being dislodged by normal impact conditions encountered on the fireground, must be considered when designing and testing the face piece harness.

C. The flame resistance and corrosion resistance of all components of SCBA's. Serious incidents have occurred where components of the apparatus have been attacked by fire or corrosive materials regularly encountered in fireground operations. The net result of this damaging contact is generally a serious exposure of the fire fighter to toxic environments. Areas that are particularly susceptable to fire and corrosion are the harness webbing and the air hoses.

D. The high resistance to breathing in positive pressure type SCBA's. Although there has been some recent improvement on the part of several manufacturers, the high resistance to breathing continues to be a problem with positive pressure apparatus. The additional fatique related to this resistance is presenting a significant draw back to the use of this generally superior equipment.

E. The potential for interchangeability among various manufacturer's equipment without voiding any approvals. The present difference in threads, webbing, harnesses, regulators, and even bottles, is an intolerable situation for the fire service. Many municipalities are bound to accept the lowest competitive bid for their breathing apparatus. This requirement does not allow a great degree of standardization on one manufacturer's product. Consequently, the collection of various brands of SCBA's that may arrive on a multiple alarm fire situation is indeed variable. In these instances, significant time is necessary to replace malfunctioning equipment with equipment of the same manufacturer.

F. The lack of simple non-ratchet type valves and uniform hose connections. The operation of the rather complicated valving system on existing SCBA's is often time consuming, confusing, and irritating to fire fighters. Uniform, quick connect hose couplings would also contribute to the rapidity of donning and simplicity of the apparatus.

2. Ongoing research should be encouraged and additional research funded in the following areas of concern regarding SCBA's.

A. Integral face piece communications systems. The problem of communicating both remotely and in the adjacent environment when wearing SCBA's remains significant. Built in amplifiers and radio transmitters must be

able to withstand fire service environmental conditions as well as being economically feasible.

B. Simultaneous breathing capabilities for the fire fighter and a rescued person. The ability of one fire fighter to rescue a citizen or another fire fighter from within hazardous atmospheres without removing his face piece, is indeed an important improvement. The technology to develop this system exists. These devices should be tested, approved, and required as an integral part of SCBA's for the fire service.

C. Minimum air flow requirements for fire fighters in hazardous atmospheres. There seems to be some significant disagreement among research teams in the United States and Europe regarding the minimum air flow requirements. One thing that is generally agreed upon however, is the current minimum is not sufficient.

3. The criteria for establishing time duration ratings for SCBA's for the fire service should be revised to prevent a more realistic figure for the various units.

4. Performance criteria for air purification systems associated with bottle filling stations should be set forth by NIOSH. Many fire departments are in the process of purchasing or up-dating compressed air filling stations. The only information regarding the efficiency of, or the necessity for, filtration systems is that supplied by the manufacturer of the particular compressor.

5. A system of monitoring defect experience, fire service information exchange, and an associated manufacturer recall procedure should be defined and implemented by NIOSH and/or MESA. Past experience has shown that although manufacturers demonstrated a willingness to repair defective equipment, there has been little or no feedback to the approval agency regarding recurring problems. It is felt that the approving agency has an obligation to monitor the quality of labeled products and to insure that recurring problems are handled through a recall process of all similar equipment.

The NFPA is extremely interested in the improvement of the entire fire fighters' protective envelope as a means of significantly reducing injury to fire fighters. We feel that it is well within the scope of NIOSH to vigorously proceed with sponsored research, development of, and promulgation of testing standards towards this end. Certainly, the respiratory protection area deserves your immediate attention, but we strongly encourage you to broaden your activities in all of the pertinent areas.