My name is Richard M. Duffy. I am the Industrial Hygienist and Occupational Health and Safety Coordinator for the International Association of Fire Fighters, AFL-CIO, CLC and I am here this morning to present to you our concerns and views associated with the role of the National Institute for Occupational Safety and Health in the testing and certification of respiratory protective equipment. I am accompanied today by Bill Hoyle, President of our Washington, D.C. affiliate. We will both be available to answer questions at the conclusion of this testimony.

In order for NIOSH, as well as others in attendance here, to fully understand what the International Association of Fire Fighters is and what its interests are in the testing and certification of respiratory protective equipment, I will first offer some brief, preliminary background information about our organization.

The International Association of Fire Fighters is an international union affiliated with the AFL-CIO and the Canadian Labor Congress. We have been in existence since 1918 and our offices are located at 1750 New York Avenue, N.W., Washington, D. C.

At present we represent approximately 180,000 paid professional fire service employees in the United States and Canada. This total membership represents approximately 75% of the paid professional fire fighters in the United States and approximately 95% in Canada. The membership of the IAFF works for various employers including the federal government, states, counties, municipalities, fire districts, airports, and industrial manufacturers. While our membership may be diverse in terms of geographical location, climate, fire ground tactics, apparatus, and equipment, one thing all our fire fighters have in common is that they utilize respiratory protective equipment, specifically self-contained breathing apparatus.

The IAFF has been deeply involved with fire fighters occupational safety and health problems for the past 25 years. We have worked with a number of government agencies on research and development projects designed to improve fire fighters' personal protective equipment. For example we have worked with the National Aeronautics and Space Administration on a project designed to incorporate advancing "space age" technology into the development of a new generation of self-contained breathing apparatus. In another project with NASA and the United States Fire Administration we are continuing work on a complete integrated fire fighters protective ensemble. Our organization developed specific standards under a National Bureau of Standards grant for fire fighters personal protective equipment and we have worked and will continue to work with various government agencies, such as the Occupational Safety and Health Administration and NIOSH, and consensus standard organizations, such as the National Fire Protection Association, on developing better standards for the protection of fire fighters' safety and health.

Another area which I would like to discuss briefly is the incidence of IAFF members' deaths, injuries, and illnesses. Each year we conduct an annual Death and Injury survey with the cooperation of our affiliates and the various fire department administrators. Over the past several years this survey has indicated that fire fighting is the most hazardous occupation in the United States. Our latest report indicates that a total of 135 IAFF fire fighters lost their lives in on-the-job accidents or from occupational diseases. There were 74 deaths of professional fire fighters in the line of duty during that year and 61 deaths attributed to occupationally induced diseases. Of those fire fighter deaths attributed to occupational diseases, heart disease is the

single greatest contributor to death at 77 percent and lung disease is second at 21 percent. These figures reflect recognition as an occupational related disease required by the applicable heart and lung statutes. An uncounted factor is the number of fire fighter deaths each year that occur due to occupationally induced diseases that are not recognized by statute and not included in the total.

The latest survey also indicates that 391 fire fighters were forced to retire or change occupations because of occupational diseases. Of this number, 260 had heart disease, 53 respiratory disease, and the remainder suffered from other ailments.

During the same year, 46,668 injuries were sustained by fire fighters, of which 33,353 injuries were sustained while at the scene of a fire. Injuries sustained on the job forced 587 fire fighters to leave their departments or retire.

Our statistics also reflect that 10 percent of the total injuries were caused by inhalation of toxic gases. While our survey does not identify the causal factors involved in fire fighter fatalities, a review of our files indicate that a large percentage of IAFF membership deaths can be contributed to the inhalation of toxic gases. Most in attendance here today have heard of the fire fighter deaths in Syracuse, New York, Lubbock, Texas, Los Angeles, California and most recently Dade County, Florida and Saskatoon, Saskatchewan, where the use of self-contained breathing apparatus played a role. These fire fighter deaths and many others that have occurred while utilizing SCBA can be attributed to breathing apparatus performance (demand versus positive pressure), deficiencies in fire department procedures governing SCBA use (testing, maintenance and repair), breathing apparatus malfunction (poor engineering design or

lack of maintenance and/or repair), or entrapment and/or disorientation with subsequent depletion of air supply.

While all fire fighters recognize the danger of a collapsing wall, explosion, backdraft, or other unanticipated events on a daily basis, they must also contend with fire, smoke, heat, and toxic gases as a regular condition of their employment. It is therefore, essential that there be sufficient and adequate personal protective equipment for the fire fighter to execute each and every hazardous assignment. In addition, the fire fighters' SCBA is his life line during a fire emergency and each time he enters a burning structure he places his life on its integrity.

Because of the importance of SCBA's the IAFF has in the past alerted NIOSH of the various problems we have uncovered in the field. Our efforts as well as those of NIOSH I am pleased to say, have especially intensified after the Lubbock, Texas incident. We are hopeful that this public hearing results in a program that will benefit the users of respiratory equipment.

To begin our testimony today, I would like to state that the IAFF fully concurs with the NIOSH position, where under the Department of Health and Human Services, NIOSH <u>alone</u> would develop a new testing and certification program and become the sole agency to test and certify respiratory protective equipment. To illustrate the strong feeling of the IAFF on this position the following resolution will be submitted for membership vote at our 35th Convention this August, which was proposed by the IAFF Executive Board, our International Standing Committee for Occupational Safety and Health, and a number of our affiliates:

WHEREAS, the National Institute for Occupational Safety and Health is currently revamping its Testing and Certification Branch, which tests self-contained breathing apparatus and other personal protective equipment to assure that it conforms to government regulations, and

WHEREAS, some manufacturers of personal protective equipment would like to see NIOSH get out of the certification and testing business so as to allow for certification by independent labs or self-certification by the manufacturers, and

WHEREAS, other government agencies, such as the U. S. Fire Administration have expressed an interest for doing such certification and testing for which they are not qualified to perform, do not have the funding to perform, or have the credibility to perform, therefore, be it

RESOLVED, that the IAFF support the concept that the National Institute for Occupational Safety and Health be the sole governmental agency for certification of personal protective equipment, including self-contained breathing apparatus.

Our rationale for this position includes the following:

1) While MSHA has played a relatively passive role in the NIOSH/MSHA certification and testing program of respirators in the past, the potential jurisdictional disputes, bureaucratic entanglement, and duplication of efforts would not benefit the users if the agency decided to play an active role. In addition, the limited government resources and personnel should be utilized where they would be most beneficial and that we strongly believe, would be under a single agency jurisdiction.

2) We are well aware that during the course of these hearings those in attendance will hear a number of views on the advantages and disadvantages of NIOSH certifying private laboratories for the actual testing and certification of respirators utilizing NIOSH specified performance standards. We do not believe that this would be a viable alternative. First, our members would have less trust in the integrity of the product, which would certainly hamper this international union's efforts in educating our workforces need to don SCBA's at all fire emergencies. Second, NIOSH expertise and general understanding of a specific respiratory protective device, gained during a certification and testing exercise, would be lost. This loss would hamper the proposed field-auditing program and would inhibit and delay any stop-sales/recall procedure if engineering defects or unapproved changes were uncovered in the field. Third, the consistency of the actual testing between the various certified laboratories would, at best, be marginal. Recent experience with NIOSH and different manufacturers have proven that testing performed at different locations, while following specific criteria, have differed. The use of different types of testing equipment, geographic location or altitude, and a number of other variables may play an important part in the actual testing. Thus, to remain consistent, one location should be utilized for the certification and testing of all manufacturers products. We also believe that the "policing" of the independent laboratories and/or the manufacturers would use up as much resources as the in-house testing by NIOSH.

The following comments formulate the IAFF's position on the specific issues outlined in the June 18, 1980 Federal Register.

Performance Standards

Most in attendance here are well aware that the 30 CFR Part 11 Regulations, which specify the required tests to be performed in certifying respiratory protection devices, were developed by the Bureau of Mines, a government agency whose principal concern was for miners. Unfortunately, while NIOSH, whose statutory concern is for all workers, now certifies and tests respirators, only very limited changes have been made to the original BOM testing requirements. In essence, the testing and certification procedures (30 CFR Part 11) do not take into account the hostile environment faced by today's fire fighters.

I would like to give some specific examples of the short-comings of the present schedule which adversely affects the performance of the SCBA's used by fire fighters. First though, I would like to point out that the equipment manufactured today is built to satisfy the NIOSH/MSHA requirements. The requirements are essentially the recipe that each manufacturer follows for each piece of equipment. Because of the present equipment expense and the procurement practices of federal, state, and local governments (i.e., competitive bidding for products and services), manufacturers rarely diverge from the 30 CFR Part 11 requirements. Thus, any innovatives or changes on present equipment that would enhance the protection of the users are not incorporated, because the added expenses would place the product out of the competitive bidding market. Some examples of the shortcomings of the present SCBA requirements in relation to fire fighters' needs are as follows.

1) In the present requirements SCBA's are not required to pass either heat or flame resistance performance tests. A minimum specification for the extreme high air temperatures and radiant heat loads experienced by fire fighters -- on a daily basis in some areas -- must be set. Testing by Lawrence Livermore Labs have shown that present SCBA components will not withstand many of these extremes. They have recommended, and the IAFF concurs, that minimum specifications should be set at, or slightly above, those temperatures at which man can survive.

2) Corrosion and moisture resistance should also be addressed in NIOSH criteria. The effect of corrosion is apparent -- failure of breathing apparatus or increased breathing resistance to the user which can cause hyper-ventilation and injury. The causes of corrosion in fire fighter SCBA components is due to exposure of moisture or water, high-expansion foams used in certain fire fighting instances, and exposure to certain toxic chemicals. Corrosion is also accelerated by the use of electrochemically dissimilar metals -- such as copper alloys and aluminum -- which are used in some manufacturers' regulators. High relative humidity or direct water contact may also cause regulator malfunction and must also be addressed.

3) Cold temperatures are also a problem for fire fighters. As specified by most manufacturers today, SCBA's are tested and certified at -25^{o} F. Since the passage or failure of test is determined during man-testing, it is a subjective test, and equipment would fail if the test subject experienced undue discomfort or breathing resistances. Questions regarding this test include whether it is adequate to assure proper performance of the SCBA in

northern locations during the winter months and whether there is a need for cold soaking of the device prior to any testing.

4) Thermal shock is also a problem experienced by fire fighters and may be a cause for equipment malfunction; therefore it also should be addressed.

5) There should also be performance standards for durability and dependability of the SCBA, which reflect fire fighters needs.

6) Facepiece size must also be addressed. Manufacturers presently have only one size facepiece, which does not allow proper fit for those who have smaller and slimmer facial features (i.e., woman).

7) More audible and more effective low-pressure warning devices are needed to be specified in the testing criteria. While present alarms are clearly audible in the station house, they can barely be heard or differentiated from others while in a hostile fire environment.

8) Aside from these specific criteria, the fire fighter also needs communication capabilities built into the SCBA, a buddy-breathing capability that will not affect the performance of the device, and the need to allow the interchangeability of air bottles during mutual aid responses, if, and only if, they are identical, standardized bottles.

The IAFF realizes that the first priority of NIOSH is the development of a new testing and certification program. However, considerable research has already been conducted in many of these areas which NIOSH should utilize so as not to cause any considerable delay in the upgrading of the approval criteria.

Quality Control

The IAFF is in agreement with the NIOSH position that the applicants Quality Control program should be the applicant's responsibility. The onus and liability of such a program must rest with the manufacturer. We also agree with the need for field auditing of both used and unused equipment. The field audits of used equipment could be used by NIOSH in upgrading the approval criteria and to point out areas that need careful examination during approval exercises.

Engineering Drawings with Dimensional Tolerances

While there may not be a need for careful NIOSH review and approval of engineering drawing, they should remain part of the approval package so that they remain on hand if a design problem does arise that needs immediate action. This would avoid the delay in procuring this information from the manufacturer and would thus afford the user better protection.

Changes to Approved Devices

While we agree with the NIOSH position in regards to handling changes to approved devices because of their present tax on TCB program resources, there is a need for better and specific definitions for "form, fit, or function". Also, one question that must be addressed is - would approval be voided if components from the previously approved device such as face mask or air bottles are used on the newer model, which may be essentially similar, but, for example, had engineering changes within the devices regulator.

Witnessing of Approval Tests

From our own experience in seeing first hand the "bickering" that has accompanied the testing in Morgantown, W. VA., we certainly concur with NIOSH's position.

Duration of Approval

The IAFF agrees that respiratory devices be submitted for reapproval every five years. We feel that this procedure would give the user greater confidence in the utilization of the device, knowing full well that the device has recently passed the approval requirements.

Unpublished Test Requirements

We agree with the need for the publishing of test requirements. We also believe that the test requirements be specific and clear. This should include the type of equipment used, the manufacturer (s) of test equipment components, the protocol for the test (including how equipment is calibrated, etc.) and the conditions in which the tests will be performed (temperature, humidity, etc.). This would allow the manufacturers, if they wish, to procure and utilize identical equipment and procedures as those that NIOSH will use during the certification of their products.

Approval Tests

We agree that only production models of respirators, identical to those sold to the user be tested. The reasons are quite obvious. We believe that present devices that are submitted for approval are carefully examined

and tested by the applicant's engineering staff prior to submission to NIOSH. This equipment may therefore be different, for example in quality, to those that are sold in the open market. The field-auditing would also verify that those devices submitted for approval are identical to those sold to the user.

Group Testing of Respirators

The IAFF reserves comment on the group testing of respirators until such time that the designated acceptance periods are defined. If these acceptance periods are spaced so far apart in time so as to preclude or delay new and advance equipment from reaching the user, we would have to take exception with this procedure.

User and Maintenance Manuals

Again, the need for specific user and maintenance manuals are obvious. We would hope they would be two separate and distinct manuals so that the users do not perform maintenance and/or repair on the equipment. The IAFF position is that only personnel that have been certified by the manufacturer or government agency be allowed to perform these tasks. We would also hope that there be uniformity among the various manufacturers manuals to avoid any confusion in the field.

NIOSH Systems Manual

We agree with the need for a specific manual that defines the entire operating procedures of the testing and certification program. We would

hope that each part of this manual is worded (or in the case of highly technical areas, summarized) so that the user can clearly understand the proceedings.

Publication of Test Data

The IAFF strongly agrees with the publishing of test data. This information could also be summarized so that the user would understand the results. We certainly agree that this would make the manufacturers more responsible while preparing the approval package, and would also give the user a specific data base to use when deciding which manufacturers equipment would best suit their needs. While we are sure that there will be disagreement by the manufacturers on this issue, it should be stated that much of this information is presently available under the Freedom of Information Act.

In summary, the IAFF supports the program that NIOSH is planning to develop and we hope that there is limited delay. We will be available for any assistance that NIOSH may need during development and implementation of this program. We certainly hope that this program will eventually allow the user to have confidence in a NIOSH-approved label -- their life depends on it. Thank you.