

## Report of the Committee on

## Fire Service Occupational Safety and Health

Glenn P. Benarick, *Chair*

Vienna, VA [U] Rep. NFPA Fire Service Section

Murrey E. Loffin, *Secretary*

Virginia Beach Fire Department, VA [U]

Rep. NFPA Fire Service Section

(Alt. to Glenn P. Benarick)

Donald Aldridge, Lion Apparel, Inc., OH [M]  
 David J. Barillo, University of Florida College of Medicine, FL [SE]  
 Paul “Shon” Blake, City of Baytown Fire & Rescue Services, TX [E]  
 Rep. Industrial Emergency Response Working Group  
 Sandy Bogucki, Yale University Emergency Medicine, CT [SE]  
 Dennis R. Childress, Orange County Fire Authority, CA [U]  
 Rep. California State Firefighters Association  
 Bradd K. Clark, City of Claremore, Oklahoma Fire Department, OK [U]  
 Rep. International Fire Service Training Association  
 Dominic J. Colletti, Hale Products, Inc., PA [M]  
 Rep. Fire Apparatus Manufacturers Association  
 Thomas J. Cuff, Jr., Firemens Association of the State of New York, NY [U]  
 I. David Daniels, Fulton County Fire Department, GA [E]  
 Rep. International Association of Fire Chiefs  
 Phil Eckhardt, Mine Safety Appliances Company, PA [M]  
 Rep. International Safety Equipment Association  
 Jodi A. Gabelmann, Cobb County Fire and Emergency Services, GA [L]  
 Rep. Women in the Fire Service, Inc.  
 Richard F. Gale, West Allis Fire Department, WI [L]  
 Rep. International Association of Fire Fighters  
 Tom Hillenbrand, Underwriters Laboratories Inc., IL [RT]  
 Jonathan D. Kipp, Primex3, NH [I]  
 Steve L. Kreis, City of Phoenix Fire Department, AZ [E]  
 Tamara DiAnda Lopes, Reno Fire Department, NV [U]  
 David A. Love, Jr., Volunteer Firemen’s Insurance Services, Inc., PA [I]  
 Rep. Volunteer Firemen’s Insurance Services, Inc.  
 George L. Maier, III, New York City Fire Department, NY [U]  
 Stephen E. Norris, United Firefighters of Los Angeles City, CA [L]  
 Richard S. Pike, Wantagh Fire District, AZ [U]  
 Rep. Association of Fire Districts/State of New York  
 David J. Prezant, New York City Fire Department, NY [E]  
 Joseph W. Rivera, US Air force, FL [U]  
 Mario D. Rueda, Los Angeles City Fire Department, CA [U]  
 Daniel G. Samo, ENH - OMEGA, IL [SE]  
 Charles C. Soros, Fire Department Safety Officers Association, WA [E]  
 Rep. Fire Department Safety Officers Association  
 Donald F. Stewart, Medocracy Inc./Fairfax County Fire & Rescue, VA [E]  
 Philip C. Stittleburg, LaFarge Fire Department, WI [U]  
 Rep. National Volunteer Fire Council  
 Clifford H. Turen, University of Maryland Orthopaedics, MD [SE]  
 Teresa Wann, Santa Ana College, CA [SE] Rep. Santa Ana College  
 Don N. Whittaker, US Department of Energy, ID [E]  
 Hugh E. Wood, US Department of Homeland Security, MD [SE]  
 Kim D. Zagaris, State of California, CA [E]

## Alternates

Janice C. Bradley, International Safety Equipment Association, VA [M]  
 (Alt. to Phil Eckhardt)  
 Angelo M. Catalano, New York State Association of Fire Districts, NY [U]  
 (Alt. to Richard S. Pike)  
 Niles R. Ford, Fulton County Fire Department, GA [E]  
 (Alt. to I. David Daniels)  
 Craig A. Fry, Los Angeles City Fire Department, CA [U]  
 (Alt. to Mario D. Rueda)

John Granby, Lion Apparel, Inc., OH [M]  
 (Alt. to Donald Aldridge)  
 Gordon W. Harris, Jr., Elkhart Brass Manufacturing Company Inc., CT [M]  
 (Alt. to Dominic J. Colletti)  
 Allen S. Hay, Fire Department City of New York, NY [U]  
 (Alt. to George L. Maier)  
 Thomas Healy, Daisy Mountain Fire District, AZ [E]  
 (Alt. to Steve L. Kreis)  
 James Johannessen, Underwriters Laboratories Inc., PA [RT]  
 (Alt. to Tom Hillenbrand)  
 Sandra S. Kirkwood, Las Vegas Fire/Rescue Department, NV [SE]  
 (Alt. to Teresa Wann)  
 Gary L. Neilson, Reno Fire Department, NV [U]  
 (Alt. to Tamara DiAnda Lopes)  
 Cathleen S. Orchard, Monterey Park Fire Department, CA [L]  
 (Alt. to Jodi A. Gabelmann)  
 David Ross, Toronto Fire Services, Canada [E]  
 (Alt. to Charles C. Soros)  
 Thomas J. Ryan, US Air Force, FL [U]  
 (Alt. to Joseph W. Rivera)  
 Michael W. Smith, Nevada Division of Forestry, NV [U]  
 (Alt. to Philip C. Stittleburg)  
 Michael L. Young, Volunteer Firemen’s Insurance Services, Inc., PA [I]  
 (Alt. to David A. Love)

## Nonvoting

Matthew I. Chibbaro, US Department of Labor, DC [E]  
 Rep. Occupational Safety & Health Administration  
 Thomas R. Hales, US Department of Health & Human Services, OH [RT]  
 Robert B. Bell, US Department of Labor, DC [E]  
 Rep. Occupational Safety & Health Administration  
 (Alt. to Matthew I. Chibbaro)  
 Mark F. McFall, US Department of Health & Human Services, WV [RT]  
 (Alt. to Thomas R. Hales)

Staff Liaison: Carl E. Peterson

**Committee Scope:** This Committee shall have primary responsibility for documents on occupational safety and health in the working environment of the fire service. The Committee shall also have responsibility for documents related to medical requirements for fire fighters.

*This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the front of this book.*

The Technical Committee on **Fire Service Occupational Safety and Health** is presenting two Reports for adoption, as follows:

**Report I:** The Committee proposes for adoption, a complete revision to NFPA 1500, **Standard on Fire Department Occupational Safety and Health Program**, 2002 edition. NFPA 1500-2002 is published in Volume 10 of the 2004/2005 National Fire Codes and in separate pamphlet form.

NFPA 1500 has been submitted to letter ballot of the **Technical Committee on Fire Service Occupational Safety and Health**, which consists of 33 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

**Report II:** The Technical Committee proposes for adoption, a complete revision to NFPA 1582, **Standard on Comprehensive Occupational Medical Program for Fire Departments**, 2003 edition. NFPA 1582-2003 is published in Volume 11 of the 2004/2005 National Fire Codes and in separate pamphlet form.

NFPA 1582 has been submitted to letter ballot of the **Technical Committee on Fire Service Occupational Safety and Health**, which consists of 33 voting members. The results of the balloting, after circulation of any negative votes, can be found in the report.

1500-1 Log #CP46 **Final Action: Accept**  
(Entire Document)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Completely revise NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, 2002 edition as shown in the draft at the end of this report. All text from proposals with affirmative actions have been incorporated in the draft.

**SUBSTANTIATION:** In addition to the specific changes documented with committee proposals, the committee reviewed the entire document and has editorially clarified the language where appropriate.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-2 Log #CP26 **Final Action: Accept**  
(1.3.2)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Delete the words “or industrial fire departments”.

**SUBSTANTIATION:** There is confusion between 1.3.1 and 1.3.2 if industrial fire departments are mentioned in both paragraphs. NFPA 1500 is intended to be applicable to industrial fire departments.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-3 Log #CP27 **Final Action: Accept**  
(1.4.2)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Delete the phrase “as allowed in 5.2.11.”

**SUBSTANTIATION:** Paragraph 5.2.11 is not an equivalency issue and does not need to be referenced in Chapter 1.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-4 Log #3 **Final Action: Accept in Principle**  
(2.2, 2.3.4, 3.3, 7.18, 7.19, 8.5, A.7.19.2, H.1.2.1 & H.1.2.5)

**SUBMITTER:** Glenn P. Benarick, Fairfax County Fire and Rescue Dept.

**RECOMMENDATION:** NOTE: This Proposal originates from Tentative Interim Amendment 02-1(1500) issued by the Standards Council on August 6, 2003.

1. Add the following new reference to Section 2.2 to read:  
NFPA 1951, Standard on Protective Ensemble for USAR Operations, 2001 edition.

2. Revise the following reference in Section 2.2 to read:  
“NFPA 1981 Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services, 2002 edition.

3. Add the following new references to 2.3.4 as follows:  
NIOSH Self-Contained Breathing Apparatus for Use Against Chemical, Biological, Radiological, and Nuclear (CBRN) Agents Regulation 2002.  
NIOSH Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air Purifying Respirator Standard 2003.

4. Revise section 3.3 to add the following new definitions to read:  
“Biological Terrorism Agents. Liquid or particulate agents that can consist of a biological derived toxin or pathogen used to inflict lethal or incapacitating casualties.”

“Chemical Terrorism Agents. Liquid, solid, gaseous, and vapor chemical agents, and dual use industrial chemicals used to inflict lethal or incapacitating casualties.”

“USAR Operations. Specialized skills and abilities including search, rescue, recovery, and site stabilization functions for urban search and rescue incidents, but not including wilderness or water rescue incidents.”

5. Add a new section 7.18 to read:

7.18 Protective Ensembles for USAR Operations.

7.18. Members who engage in or are exposed to the hazards of USAR operations shall be provided with and shall use a protective ensemble that is certified as compliant with NFPA 1951, Standard on Protective Ensemble for USAR Operations.

7.18.2 The protective coat and protective trousers shall have at least a 50 mm (2 in.)

overlap of all layers so there is no gaping of the total thermal and barrier protection when the protective garments are worn.

7.18.2.1 The minimum overlap shall be determined by measuring the garments on the wearer, without respiratory protection, in both of the following conditions:

(1) Position A. Standing, hands together reaching overhead as high as possible.

(2) Position B. Standing, hands together reaching overhead, with the body bent forward at a 90 degree angle, with the body bent to either the left or right side and with the body bent to the back.

7.18.2.2 Single-piece protective coveralls shall not be required to have an overlap of all layers provided there is continuous composite protection.

7.18.3 Members engaged in USAR operations that require respiratory protection shall be provided with and shall use respirators that are certified by NIOSH to 42 CFR Part 84.

7.18.3.1\* Where air purifying respirators (APR) and powered air purifying respirators (PAPR) are selected to provide the respiratory protection, the APRs and PAPRs shall be provided with the proper chemical or particulate filter elements that provide protection against the specific contaminants based upon the anticipated level of exposure risk associated with different response situations.

7.18.3.2\* Where it cannot be determined that an APR or PAPR will provide effective protection against the contaminant, or if the identity of the contaminant is not known, members shall not use APRs or PAPRs.

7.18.3.3 Where SCBA are selected to provide the respiratory protection, the SCBA shall meet the applicable requirements of 7.10.1

7.18.4 USAR protective clothing and protective equipment shall be used and maintained in accordance with manufacturer’s instructions.

7.18.4.1 The fire department shall establish a maintenance and inspection program for USAR protective clothing and equipment.

7.18.4.2. Proper decontamination procedures for all USAR protective clothing and equipment shall be followed to prevent contamination of the user or support personnel.

6. Add a new Section 7.19 to read:

7.19 Protective Ensembles for Chemical and Biological Terrorism Incidents.

7.19.1 Members who engage in assessment, extrication, rescue, triage, treatment decontamination, and support function operations involving chemical or biological terrorism incidents shall be provided with the protective ensembles and protective equipment specified in this section.

7.19.2\* The approach to any potentially hazardous atmosphere, including biological hazards, shall be made with a plan that includes an assessment of the hazard and exposure potential, respiratory protection needs, entry conditions, exit routes, and decontamination strategies.

7.19.2.1 Before emergency response personnel are assigned to operations at chemical or biological terrorism incidents, the incident commander shall perform a risk assessment of the incident to determine the needs of the protective ensembles and protective equipment.

7.19.3 Where the risk assessment indicates one or more of the following, all members who will be performing the operations shall be provided with and shall use at least Class 1 ensembles certified as compliant with NFPA 1994, Standard on Protective Ensembles for Biological/ Chemical Terrorism Incidents:

(1) There is an on-going release of the agent with likely gas/vapor exposure.

(2) The identity or concentration of the vapor or liquid agent is unknown.

(3) Liquid contact is expected and no direct skin contact can be permitted.

(4) Exposure of members could be at levels that would result in substantial possibility of immediate death, immediate serious incapacitation, or the ability to escape will be severely impaired.

(5) Most victims in the area appear to be unconscious or dead.

(6) Members will be close to the point of release.

7.19.3.1 All members who engage in operations involving chemical or biological terrorism incidents and who are required to wear NFPA 1994 Class 1 ensembles specified in 7.19.3, or NFPA 1991, vapor-protective ensembles, specified in 7.19.3.2, shall be provided with and shall use either of the following respiratory protection:

(1) SCBA that meet the applicable requirements of 7.10.1, provided that the SCBA is fully encapsulated by the protective ensemble; or

(2) Open-circuit SCBA that are certified by NIOSH as compliant with the NIOSH Self-Contained Breathing Apparatus for Use Against Chemical, Biological Radiological, and Nuclear (CBRN) Agents Regulation.

7.19.3.2 Use of vapor-protective ensembles certified as compliant with NFPA 1991, Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies, and certified as compliant with the optional chemical and biological terrorism requirements specified in Section 5.9 of NFPA 1991, shall be permitted where the risk assessment indicates that NFPA 1994 Class 1 ensembles would provide the necessary protection for the incident or operation.

7.19.4. Where the risk assessment indicates one or more of the following, all members who will be performing the operations shall be provided with and shall use at least Class 2 ensembles certified as compliant with NFPA 1994, Standard on Protective Ensembles for Biological/ Chemical Terrorism Incidents.

(1) The agent or threat has generally been identified.

(2) The actual release has subsided but where the potential for direct contact with residual vapor or gas is probable.

(3) Surfaces at the emergency scene are highly contaminated.

(4) Victims in the area are symptomatic, not ambulatory showing, but showing signs of movement.

7.19.4.1 All members who engage in operations during chemical and biological terrorism incidents and who are required to wear NFPA 1994 Class 2 ensembles shall use either:

(1) SCBA that meet the applicable requirements of 7.10.1, provided that the SCBA is fully encapsulated by the protective ensemble; or

(2) Open-circuit SCBA that are certified by NIOSH as compliant with the NIOSH Self-Contained Breathing Apparatus for Use Against Chemical, Biological Radiological, and Nuclear (CBRN) Agents Regulation.

(3) APR with a minimum rated service life of at least 30 minutes that are certified by NIOSH as compliant with the NIOSH Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air Purifying Respirator Standard.

7.19.4.2 Use of NFPA 1994 Class 1 ensembles shall be permitted where the risk assessment indicates that NFPA 1994, Class 2 ensembles would provide the necessary protection for the incident or operation.

7.19.5 Where the risk assessment indicates one or more of the following, all members who will be performing the operations shall be provided with and shall use at least Class 3 ensembles certified as compliant with NFPA 1994 Standard on Protective Ensembles for Biological/ Chemical Terrorism Incidents:

(1) Exposure to liquids is expected to be incidental through contact with contaminated surfaces or victims well after the release has occurred.

(2) Victims are symptomatic but ambulatory.

(3) Operations are in the peripheral zone of the release scene for such functions as decontamination, patient care, crowd control, perimeter control, traffic control and clean-up.

7.19.5.1 All members who engage in operations during chemical and biological terrorism incidents and who are required to wear NFPA 1994 Class 3 ensembles shall use one of the following types of respirators:

(1) SCBA that meet the applicable requirements of 7.10.1, provided that the SCBA is fully encapsulated by the protective ensemble; or

(2) Open-circuit SCBA that are certified by NIOSH as compliant with the NIOSH Self-Contained Breathing Apparatus for Use Against Chemical, Biological Radiological, and Nuclear (CBRN) Agents Regulation.

(3) APR with a minimum rated service life of at least 30 minutes that are certified by NIOSH as compliant with the NIOSH Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air Purifying Respirator Standard.

7.19.5.2 Use of NFPA 1994 Class 1 and Class 2 ensembles shall be permitted where the risk assessment indicates that NFPA 1994 Class 3 ensembles would provide the necessary protection for the incident or operation.

7.19.6 Vapor-protective ensembles, certified as compliant with NFPA 1991, Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies and certified as compliant with the optional chemical and biological terrorism requirements specified in Section 5-9 of NFPA 1991, that are used in operations involving any exposure to chemical or biological terrorism agents shall be decontaminated following that use or shall be disposed of where decontamination will not stop the chemical or biological assault on the ensemble and the protective qualities would be diminished or nullified.

7.19.7 All NFPA 1994 Class 1, Class 2, and Class 3 protective ensembles that are used in operations involving any exposure to chemical or biological terrorism agents shall be disposed of following that use.

7.19.8 Disposal shall be in accordance with applicable local, state/provincial, and federal regulations.

7.19.9 All chemical/biological protective ensembles shall be inspected and maintained as required by the technical data package and manufacturer's instructions.

7. Add new 8.5.2.2 to read:

8.5.2.2 The rapid intervention crews/companies (RIC) at an incident where any SCBA being used are equipped with a rapid intervention company/crew (RIC) universal air connection (UAC) shall have the specialized rescue equipment include a fully charged breathing air cylinder with a NIOSH certified rated service time of at least 30 minutes and compatible pressure and capacity with the SCBA being used at the incident, or a high pressure air line of sufficient length to reach the location of the entrapped or downed fire fighter(s) and supplied by a pressurized breathing air source that can provide at least 100 liters of air per minute at the RIC UAC female fitting and at a pressure compatible with the SCBA being used at the incident.

8. Add new 8.5.2.3 to read:

8.5.2.3 Both the breathing air cylinder and the high pressure air line described in 8.5.2.2 shall be equipped with a RIC UAC filling hose assembly equipped with a RIC UAC female fitting.

9. Add new 8.5.2.4 to read:

8.5.2.4 The RIC UAC filling hose shall meet the requirements specified in 6.4.7 of NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services.

10. Add new 8.5.2.5 to read:

8.5.2.5 The RIC UAC female fitting shall meet the requirements specified in

6.4.6 of NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services.

11. Add new 8.5.2.6 to read:

8.5.2.6 The RIC UAC female fitting shall mate with the RIC UAC male fitting to form a RIC UAC coupling that meets the requirements specified in 6.4.8 of NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services.

12. Add new A.7.18.3.1 to read:

A.7.18.3.1 NIOSH provides nine classes of particulate filters (three classes of filter efficiency (95%, 99%, and 99.97%), each with three categories of resistance to filter efficiency degradation (N, R, and P)). Additionally, performance against toxic industrial gases, vapors, and certain CBRN agents are also specified by NIOSH.

13. Add new A.7.18.3.2 to read:

A.7.18.3.2 Air purifying respirators (APRs and PAPRs) do not supply oxygen. Use should be limited to known contaminants and known exposure levels, and used only in adequately ventilated areas. APRs and PAPRs cannot be used when concentrations of contaminants are unknown, or when appropriate exposure limit is not known, or when cartridge or filter service life is unknown.

14. Add new A.7.19.2 to read:

A.7.19.2 Any response plan involving a biological or WMD biological hazard should be based on relevant infectious disease or biological safety recommendations by the Centers for Disease Control and Prevention (CDC) and other expert bodies.

For the respiratory protection during these incidents, the respiratory protection program specified in Section 7.8 includes knowledge of hazards, hazard assessment, selection of proper respiratory protective equipment, fit testing, inspection and maintenance of equipment training in its use, assurance of air quality, and medical surveillance. Emergency response teams should be current with the respiratory protection program.

15. In section H.1.2.1 correct the reference to read: "ANSI Z88. Practices for Respiratory Protection 1992." (ANSI Z88.5 doesn't exist any longer.)

16. In section H.1.2.5 correct the reference to read: Under Title 29 Code of Federal Regulations Part 1910 correct the date of 29 CFR 1910.134 to read: "1998".

**SUBSTANTIATION:** Substantiation and Emergency Nature:

The TC on Fire Service Occupational Safety and Health reviewed the proposed Tentative Interim submitted by the Technical Correlating Committee on Fire & Emergency Services Protective Clothing & Equipment, TIA No. 734 published in the April 2003 issue of NFPA News, and felt that some aspects of the TIA were editorial in nature, and other parts that were not of an emergency nature requiring prompt action. Therefore, the Committee wishes to propose its own version of the TIA and is publishing it here for public review and comment.

New standards (NFPA 1951 and NFPA 1994) have been developed to address the specialized protection needs of fire and emergency service personnel who perform search and rescue and search and recovery operations, and during chemical or biological terrorism incident operations. NFPA 1500 was completed in the cycle following NFPA 1951 and NFPA 1994 but was not referenced in NFPA 1500. The proposed new Sections 7.18 and 7.19 will provide the necessary criteria for emergency responders regarding the appropriate PPE.

NFPA 1981 was in the same revision cycle as NFPA 1500. The new edition of NFPA 1981 includes an important safety device, a universal air connection for use by rapid intervention companies that would enable the rescuers to replenish the depleted breathing air supply in an entrapped or immobile emergency person without jeopardizing the breathing air supply of the rescuers. These issues are covered in the proposed revisions to Section 8.5.

This new universal air connection will be the same connection, regardless of the product manufacturer, and would be located in the same place on every new SCBA. It is important to include these requirements now. Also, the reference to the 1987 edition of NFPA 1981 is to say that SCBA now in service must not be certified to an earlier edition, but the requirement for new purchases to meet the current (2002) edition must also be stated.

Many of these proposed revisions are of an emergency nature as they reflect the safety and health of personnel performing hazardous operations. Especially considering the recent threats of terrorism acts and the actual terrorism attacks on September 11, 2001 the protection of emergency responders is receiving close attention from many agencies. These proposed revisions will support improved protection for fire and emergency responders who perform in regular emergency operations and during the newer threats and actual incidents involving terrorist attacks against civilian populations. Fire departments, law enforcement agencies hazardous materials response teams, and EMS providers deserve the attention to these issues now and can not afford to wait until the next revision of NFPA 1500 is adopted as this could take a minimum of 2 years.

**COMMITTEE MEETING ACTION: Accept in Principle**

Accept items 1 through 3

Add the proposed definition of "Chemical Terrorism Agents"

Add a definition of "Biological Terrorism Agents" to read as follows:

Biological materials that are capable of causing an acute disease or long-term damage to the human body. [1999:2003]

Add a definition for Technical Rescue to read as follows:

The application of special knowledge, skills, and equipment to safely resolve unique and/or complex rescue situations. [1670:2004]

Do not add the definition of USAR operations.

Add a new section as 7.8 to read as follows:

7.8 Protective Ensembles for Technical Rescue Operations.

7.8.1 Members of special teams whose primary function is search, rescue, recovery, and site stabilization operations for technical rescue incidents other than wilderness or water rescue incidents shall be provided with and shall use a protective ensemble that is certified as compliant with NFPA 1951, Standard on Protective Ensemble for USAR Operations.

7.8.2 The protective coat and protective trousers shall have at least a 50 mm (2 in.) overlap of all layers so there is no gaping of the total thermal and barrier protection when the protective garments are worn.

7.8.2.1 The minimum overlap shall be determined by measuring the garments on the wearer, without respiratory protection, in both of the following conditions:

(1) Position A. Standing, hands together reaching overhead as high as possible.

(2) Position B. Standing, hands together reaching overhead, with the body bent forward at a 90 degree angle, with the body bent to either the left or right side and with the body bent to the back.

7.8.2.2 Single-piece protective coveralls shall not be required to have an overlap of all

layers provided there is continuous composite protection.

7.8.3 Members engaged in technical rescue operations that require respiratory protection shall be provided with and shall use respirators that are certified by NIOSH to 42 CFR Part 84.

7.8.3.1\* Where air purifying respirators (APR) and powered air purifying respirators (PAPR) are selected to provide the respiratory protection, the APRs and PAPRs shall be provided with the proper chemical or particulate filter elements that provide protection against the specific contaminants based upon the anticipated level of exposure risk associated with different response situations.

7.8.3.2\* Where it cannot be determined that an APR or PAPR will provide effective protection against the contaminant, or if the identity of the contaminant is not known, SCBA shall be worn until it can be determined that other respiratory protection can be used.

7.8.3.3 Where SCBA are selected to provide the respiratory protection, the SCBA shall meet the applicable requirements of 7.11.1

7.8.4 Technical rescue protective clothing and protective equipment shall be used and maintained in accordance with manufacturer's instructions.

7.8.4.1 The fire department shall establish a maintenance and inspection program for technical rescue protective clothing and equipment.

7.8.4.2 Proper decontamination procedures for all technical rescue protective clothing and equipment shall be followed to prevent contamination of the user or support personnel.

Add annex material to new 7.8.3.1 and 7.8.3.2 to read as follows:

A.7.8.3.1 NIOSH provides nine classes of particulate filters (three classes of filter efficiency (95%, 99%, and 99.97%), each with three categories of resistance to filter efficiency degradation (N, R, and P)). Additionally, performance against toxic industrial gases, vapors, and certain CBRN agents are also specified by NIOSH.

A.7.8.3.2 Air purifying respirators (APRs and PAPRs) do not supply oxygen. Use shall be limited to known contaminants and known exposure levels, and used only in adequately ventilated areas. APRs and PAPRs cannot be used when concentrations of contaminants are unknown, or when appropriate exposure limit is not known, or when cartridge or filter service life is unknown.

Renumber existing 7.8 through 7.17 as 7.9 through 7.18

Accept items 6 but put the requirements in the document as 7.5.3 instead of 7.19.

Accept items 7 through 16.

**COMMITTEE STATEMENT:** The committee is integrating the wording of the TIA except is using the term technical rescue instead of USAR in new section 7.8 which was section 7.18 in the TIA. The committee feels the section is more appropriate as section 7.8. For this reason, the definition of USAR operations is not being added but a definition of technical rescue is being added.

The text in the TIA that was 7.19 is being renumbered as 7.5.3 as this is a more appropriate place in the standard for these requirements. Also the preferred definition of Biological Terrorism Agents is being used.

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-5 Log #CP4 **Final Action: Accept**  
(3.3 Definitions)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** 1. In 3.3.1, revise the definition of "aerial device" to read as follows: "An aerial ladder, elevating platform, or water tower that is designed to position personnel, handle materials, provide continuous egress, or discharge water. [1901:2003]"

2. In 3.3.10 revise the definition of "crew" to read as follows: "A team of two or more fire fighters."

3. In 3.3.16, revise the definition of "fire apparatus" to read as follows: "A vehicle designed to be used under emergency conditions to transport personnel and equipment, and to support the suppression of fires and mitigation of other hazardous situations. [1901:2003]"

4. In 3.3.18, revise the definition of "fire department" to read as follows: "An organization that provides fire suppression and other services."

5. Delete 3.3.21.1, Approach fire fighting.

6. Delete 3.3.21.2, Entry fire fighting, and delete the last sentence of A.3.3.21.3

7. Add a definition of "structural fire fighting" under 3.3.21 to read as follows: "The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, aircraft interiors, vehicles, vessels, aircraft, or like properties that are involved in a fire or emergency situation. [1710:2004]"

8. Renumber the definition of wildland fire fighting [3.3.65] so it appears under 3.3.21.

9. Delete 3.3.24, Flame resistance.

10. Delete 3.3.25, Fully enclosed area.

11. In 3.3.26, revise the definition of "hazard" to read as follows: "A condition that presents the potential for harm or damage to people, property, or the environment." Retain the existing annex for 2.2.26."

12. In 3.3.27, revise the definition of "hazardous area" to read as follows: "The area where members might be exposed to a hazard or hazardous atmosphere. A particular substance, device, event, circumstance, or condition that presents a danger to members of the fire department."

13. In 3.3.33 update the definition of "Immediately Dangerous to Life or Health (IDLH)" to read as follows: "Any condition that would pose an immediate or delayed threat to life, cause irreversible adverse health effects, or interfere with an individual's ability to escape unaided from a hazardous environment. [1670:2004]"

14. In 3.3.34.1 revise the definition of "emergency incident" to read as follows: "Any situation to which the emergency services organization responds to deliver emergency services, including rescue, fire suppression, emergency medical care, special operations, law enforcement, and other forms of hazard control and mitigation. [1561:2005]"

15. In 3.3.36, revise the definition of "incident commander" to read as follows: "The person who is responsible for all decisions relating to the management of the incident and is in charge of the incident site. [472:2002]"

16. In 3.3.37, revise the definition of "incident management system (IMS)" to read as follows: "A system that defines the roles and responsibilities to be assumed by responders and the standard operating procedures to be used in the management and direction of emergency incidents and other functions. [1561:2005]"

17. In 3.3.40, revise the definition of "life safety rope" to read as follows: "Rope dedicated solely for the purpose of supporting people during rescue, fire-fighting, other emergency operations, or during training evolutions."

18. Delete 3.3.49, Primarily assigned.

19. In 3.3.51, revise the definition of "protective ensemble" to read as follows: "Multiple elements of clothing and equipment designed to provide a degree of protection for fire fighters from adverse exposures to the inherent risks of structural fire-fighting operations and certain other emergency operations. [1974:3.85]"

20. In 3.3.52, add an attribution to show it is extracted from 1451, 2002 edition

21. In 3.3.53, revise the definition of "Rapid Intervention Crew/Company (RIC)" to read as follows: "A minimum of two fully equipped members who are on-site and assigned specifically to initiate the immediate rescue of injured or trapped members."

22. Revise 3.3.61.1 to read as follows: "~~Closed-Circuit Self-Contained Breathing Apparatus (SCBA)~~ . A recirculation-type SCBA in which the exhaled gas is re-breathed by the wearer after the carbon dioxide has been removed from the exhalation gas and the oxygen content within the system has been restored from sources such as compressed breathing air, chemical oxygen, and liquid oxygen, or compressed gaseous oxygen. [1981:2002]"

23. In 3.3.62, change the term being defined from "service testing" to "service test".

**SUBSTANTIATION:** 1. The definition of aerial device has been revised in NFPA 1901 and that revised definition is being used for this edition of NFPA 1500.

2. The definition of crew is being changed as a crew can be more than 2 persons.

3. The definition of fire apparatus has been revised in NFPA 1901 and that revised definition is being used for this edition of NFPA 1500.

4. The definition of fire department is being revised to broaden the term.

5. The definition of "Approach Fire Fighting" is not used in the document.

6. The definition of "Entry Fire Fighting" is not used in the document other than in the annex of the definition of proximity fire fighting where it is being deleted. The definition entry fire fighting is the same as proximity fire fighting other than the initial word "Extraordinarily" which is a subjective word.

7. A definition for structural fire fighting was omitted from the types of fire fighting operations and needs to be included to fill out the differences between these operations.

- 8. The definition of wildland fire fighting should be relocated under fire fighting to keep like terms together.
  - 9. The term “flame resistance” is not used in the document.
  - 10. The term “fully enclosed area” is not used in the document.
  - 11. The current definition of hazard extracted from NFPA 921 is too limiting for the way the term hazard is used in NFPA 1500.
  - 12. The current definition of hazardous area extracted from NFPA 101 is too limiting for the way the term is used in NFPA 1500 as hazardous areas can be inside or outside.
  - 13. The definition of Immediately Dangerous to Life or Health (IDLH) was revised in NFPA 1670 and that revised definition is being used for this edition of NFPA 1500.
  - 14. The committee is revising the definition of emergency incident to use the preferred definition.
  - 15. The committee is revising the definition of incident commander to use the preferred definition.
  - 16. The committee is revising the definition of incident management system to use the preferred definition.
  - 17. The current definition is a definition of rope, not life safety rope.
  - 18. The term “primarily assigned” is not used in the document.
  - 19. The committee is removing the word “structural” from the definition of “protective ensemble” as the term is used in this document to refer not only to structural protective ensembles but other types as well. With this change, the attribution to NFPA 1971 needs to be deleted as well.
  - 20. As part of the glossary of terms cleanup, this definition is extracted from NFPA 1451 and should be shown as such.
  - 21. The definition of Rapid Intervention Crew/Company (RIC) is being cleaned up to better explain what a RIC is.
  - 22. This change to closed-circuit SCBA will define the term as actually used in the document and use the preferred definition.
  - 23. The term “service test” better relates to the use in the standard.
- COMMITTEE MEETING ACTION: Accept**  
**NUMBER ELIGIBLE TO VOTE: 33**  
**BALLOT RESULTS:** Affirmative: 27  
**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-6 Log #2 **Final Action: Reject**  
**(3.3 Interoperability (New) )**

**SUBMITTER:** Gordon M. Sachs, Fairfield Fire & EMS  
**RECOMMENDATION:** Add a definition of Interoperability, as follows:  
 Interoperability: The ability of First Responder agencies to integrate and manage all communications and resources across jurisdictional and geographic boundaries, including the use of a single incident management system.  
**SUBSTANTIATION:** There currently is no definition of Interoperability in this document, nor is there a definition for this important term in the NFPA Glossary of Terms. Because it is such an important topic, there needs to be a clear, standardized definition used throughout NFPA documents that use the term or concept.  
**COMMITTEE MEETING ACTION: Reject**  
**COMMITTEE STATEMENT:** The term is not used in NFPA 1500 so does not need defining in this document.  
**NUMBER ELIGIBLE TO VOTE: 33**  
**BALLOT RESULTS:** Affirmative: 27  
**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-7 Log #CP29 **Final Action: Accept**  
**(4.2.3)**

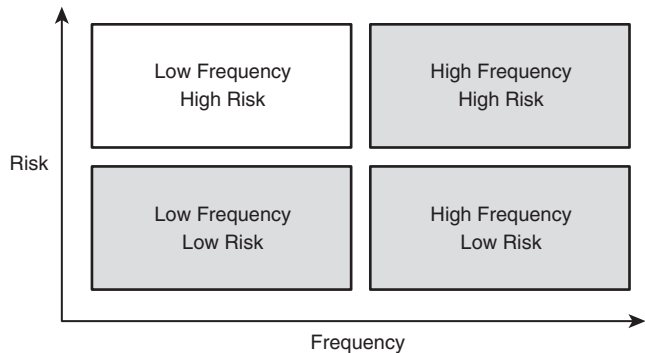
**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health  
**RECOMMENDATION:** Add a new 4.2.3(3) to read as follows:  
 Establishment of Priorities for Action. The degree of a hazard based upon the frequency and risk of occurrence.  
 Renumber existing (3) and (4) as (4) and (5)  
 Add a new A.4.2.3 to read as follows:  
 The entire risk management decision making process can be summarized as follows:

- Identify or recognize
- Evaluate
- Establish priorities for action
- Act and control
- Monitor and reevaluate

Discussions about frequency and risk arise in the Evaluation Phase. What are the real or potential risks in terms of frequency and severity to fire department members? How will the organization develop effective control measures to ensure a safe work environment for all members?

Since no two fire departments are alike, there is no standard scale to measure and evaluate frequency and risk. Some fire departments will have a greater or lesser degree of tolerance for risk than others. The intent of the risk management process is for a fire department to develop a standard level of safety. This standard level of safety defines the parameters of the acceptable

degree of risk for which members perform their job functions.  
 By definition, frequency is how often something does, or might, happen. Risk is a measure of the consequences if an undesirable event occurs. There are many factors that enter into the risk discussion, including cost, time lost from work, loss of use of resources, inability to deliver services, and fewer services available. Each risk will have its own set of factors that will dictate how the fire department will try to determine how severe the consequences might be.  
 This scale is used to establish the degree of priority. Priority of the risk is in direct relation to inherent risks that have had a harmful effect on the department and its members.  
 A primary purpose of the risk management plan is to focus efforts on incidents which may not occur very often (low frequency) but which may have severe consequences associated with them (high risk). The reason for the focus on low frequency/high risk incidents is that since they do not occur on a frequent basis responders may not be as prepared to deal with them, and the outcomes can be harmful or detrimental to fire fighters. Examples of low frequency/high risk events could include high rise fires, technical rescues, multi-alarm fires, or a mass casualty incidents.  
 There are two factors that will ensure that a low frequency/high risk event will be successful. The first factor is an aggressive training program. Every day is a training day. With an aggressive training program, this will ensure the successful outcome of an incident. The second factor is rapid prime decision making. Personnel, through training and continuous retraining, have the necessary knowledge, skills, and abilities (KSA) to ensure the successful outcome of a low frequency/high risk incident.  
 Figure A.4.2.3 illustrates the relationship between frequency and risk, and emphasizes the importance of addressing low frequency/high risk incidents.



**Figure A.4.2.3**

Add text as a new D1.3 to read as follows:  
 Establishment of Priorities for Action. Establishing priorities taken in combination with the results of the frequency and severity determinations will help to establish priorities for determining action.  
 (1) Any risk that has a low probability of occurrence, but will have serious consequences (high risk or severity), deserves immediate action and would be considered a high priority item.  
 (2) Non-serious incidents with a low likelihood of occurrence are a lower priority and can be placed near the bottom of the “action required” list.  
 Renumber existing D.1.3 through D.1.5 as D.1.4 through D.1.6.  
**SUBSTANTIATION:** Language describing the establishment of priorities was added for clarity. It was assumed that users would implement risk management control measures based on an evaluation of the need for the measure. This language, and its associated annex language, provides additional guidance.  
**COMMITTEE MEETING ACTION: Accept**  
**NUMBER ELIGIBLE TO VOTE: 33**  
**BALLOT RESULTS:** Affirmative: 27  
**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-8 Log #CPI **Final Action: Accept**  
**(4.4.5)**

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health  
**RECOMMENDATION:** Revise 4.4.5 to read as follows:  
 All accidents, near-misses, injuries, fatalities, illnesses, and exposures involving members shall be investigated.  
 Replace existing A.4.4.5 with the following:  
 The importance of investigating accidents to personnel, equipment, or vehicles in relation to the prevention of recurring accidents is time-proven. However, the incidence rate is rare considering the probability of occurrence of an accident.

Compared to the actual number of accidents reported, a significant number of incidents known as near-misses occur. The philosophy of investigating near-miss incidents deserves merit. There are countless “almost-accidents” that occur every day.

In an effort to truly prevent more accidents, and to effectively manage the safety of the personnel, near-miss incidents should be documented and quantified to truly determine the exposures to risk people, equipment, and vehicles are exposed to each day. These incident investigations begin with a culture that readily accepts near-miss incident reports without penalty or ridicule. A system must also be in place to investigate the near-miss incident to determine the causal factors involved. Examples can include human error; lack of education or training; lack of familiarity or operation of equipment; or equipment malfunctions or design shortcomings;

Managing the infinite possibilities of near-miss incidents and accidents are laborious and seemingly insurmountable. The investigation into real-world near-misses and accidents begins to humble the task. Attention to the risks measured in the workplace, and investigation into the potential incidents and accidents is, arguably, the beginning of an effective safety process.

See also A.4.4.3.

**SUBSTANTIATION:** The concept of near-misses has been very successful in the aviation industry. The fire service can utilize this concept to improve its safety and health record by investigating these incidents and implementing change to reduce the frequency and severity of accidents and injuries.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-9 Log #CP3 **Final Action: Accept**  
(4.7)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add new text to read as follows:

4.7 Appointment of the Health and Safety Officer.

4.7.1 The fire chief shall appoint a designated fire department health and safety officer.

4.7.2 The health and safety officer shall meet the qualification defined in NFPA 1521, Standard on Fire Department Safety Officer.

4.7.3 The fire chief shall ensure the fire department health and safety officer is given the authority to administer the health and safety program.

4.7.4 The health and safety officer shall perform the functions defined in NFPA 1521.

4.7.5 The fire department health and safety officer shall be responsible for the management of the occupational safety and health program.

4.7.6 The fire chief shall make available such additional safety officers and resources as required to fulfill the requirements of the occupational safety and health program to meet the requirements of NFPA 1521.

Add “NFPA 1521, Standard on Fire Department Safety Officer, 2002 edition” to 2.2.

**SUBSTANTIATION:** This new section defines the appointment and establishment of the Health and Safety Officer position to ensure compliance with NFPA 1521.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-10 Log #CP2 **Final Action: Accept**  
(4.7 through 4.20)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Delete Sections 4.7 through 4.20.

**SUBSTANTIATION:** This material was added during the last revision cycle in anticipation of NFPA 1521, Standard on Fire Department Safety Officer, being withdrawn during the Annual Meeting 2002 cycle. Since NFPA 1521 has not and will not be withdrawn, this is now duplicate material is being removed from NFPA 1500.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-11 Log #CP5 **Final Action: Accept**  
(Chapter 5)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise chapter 5 to read as follows:

Chapter 5 Training, Education and Professional Development

5.1 General Requirements.

5.1.1 The fire department shall establish and maintain a training, education and professional development program with a goal of preventing occupational deaths, injuries, and illnesses.

5.1.2 The fire department shall provide training, education and professional development for all department members commensurate with the duties and functions that they are expected to perform.

5.1.3 The fire department shall establish training and education programs that provide new members initial training, proficiency opportunities, and a method of skill and knowledge evaluation for duties assigned to the member prior to engaging in emergency operations.

5.1.4\* The fire department shall restrict the activities of new members during emergency operations until the member has demonstrated the skills and abilities to complete the tasks expected.

5.1.5 The fire department shall provide all members with training and education on the department’s risk management plan.

5.1.6 The fire department shall provide all members with training and education on the department’s written procedures .

5.1.7 The fire department shall provide all members with a training, education and professional development program commensurate with the emergency medical services that are provided by the department.

5.1.8 The fire department shall provide all members with a training and education program that covers the operation, limitation, maintenance, and retirement criteria for all assigned personal protective equipment expected to be utilized by members.

5.1.9 As a duty function, members shall be responsible to maintain proficiency in skills, knowledge and professional development provided to the member through department training and education programs.

5.1.10 Training programs for all members engaged in emergency operations shall include procedures for the safe exit and accountability of members during rapid evacuation, equipment failure, or other dangerous situations and events.

5.1.11 All members who are likely to be involved in emergency operations shall be trained in the incident management and accountability system used by the fire department.

5.2 Member Qualifications.

5.2.1 All members who engage in structural fire fighting shall meet the requirements of NFPA 1001, Standard for Fire Fighter Professional Qualifications.

5.2.2\* All driver/operators shall meet the requirements of NFPA 1002, Standard for Fire Apparatus Driver/Operator Professional Qualifications.

5.2.3 All aircraft rescue fire fighters (ARFF) shall meet the requirements of NFPA 1003, Standard for Airport Fire Fighter Professional Qualifications.

5.2.4 All fire officers shall meet the requirements of NFPA 1021, Standard for Fire Officer Professional Qualifications.

5.2.5 All wildland fire fighters shall meet the requirements of NFPA 1051, Standard for Wildland Fire Fighter Professional Qualifications. (See Annex E.)

5.2.6\* All members responding to hazardous materials incidents shall meet the operations level as required in NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents.

5.3 Training Requirements.

5.3.1 \* The fire department shall adopt or develop training and education curriculums that meet the minimum requirements outlined in professional qualification standards covering a member’s assigned function.

5.3.2 The fire department shall provide training, education and professional development programs as required to support the minimum qualifications and certifications expected of its members.

5.3.3 Members shall practice assigned skill sets on a regular basis but not less than annually.

5.3.4 The fire department shall provide specific training to members when written policies, practices, procedures, or guidelines are changed and/or updated.

5.3.5 \* The respiratory protection training program shall meet the requirements of NFPA 1404, Standard for Fire Service Respiratory Protection Training.

5.3.6 Members who perform wildland fire fighting shall be trained at least annually in the proper deployment of an approved fire shelter.

5.3.7 \* All live fire training and exercises shall be conducted in accordance with NFPA 1403, Standard on Live Fire Training Evolutions.

5.3.8 \* All training and exercises shall be conducted under the direct supervision of a qualified instructor

5.3.9 \* All members who are likely to be involved in emergency medical services shall meet the training requirements of the authority having jurisdiction.

5.3.10 \* Members shall be fully trained in the care, use, inspection, maintenance, and limitations of the protective clothing and protective equipment assigned to them or available for their use.

5.3.11 All members shall meet the training requirements as outlined in NFPA 1561, Standard on Emergency Services Incident Management System.

5.3.12 All members shall meet the training requirements as outlined in NFPA 1581, Standard on Fire Department Infection Control Program.

5.4 Special Operations Training.

5.4.1 The fire department shall provide specific and advanced training to members who engage in special operations as a technician.

5.4.2 The fire department shall provide specific training to members who are

likely to respond to special operations incidents in a support role to special operations technicians.

5.4.3 Members expected to perform hazardous materials mitigation activities shall meet the training requirements of a technician as outlined in NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents.

5.4.4 Members expected to perform technical operations at the technician level as defined in NFPA 1670, Standard on Operations and Training for Technical Rescue Incidents, shall meet the training requirements specified in NFPA 1006, Standard for Rescue Technician Professional Qualifications.

5.5 Member Proficiency.

5.5.1 The fire department shall develop a reoccurring proficiency cycle with the goal of preventing skill degradation and potential for injury and death of members.

5.5.2 The fire department shall develop and maintain a system to monitor and measure training progress and activities of its members.

5.5.3 \* The fire department shall provide an annual skills check to verify minimum professional qualifications of its members.

Revise and add annex materials for Chapter 5 will read as follows

A.5.1.1 The primary goal of all training, education and professional development programs is the reduction of occupational injuries, illnesses, and fatalities. As members progress through various job duties and responsibilities, the department must ensure the introduction of the necessary knowledge, skills, and abilities to members who are new in their job titles, as well as ongoing development of existing skills.

These programs should include information to ensure that members are trained prior to performing individual duties, as well as ongoing professional development to ensure competency.

Training programs should include but not limited to:

1. Community Risk Reduction (Fire Prevention, Public Education, Investigation, etc.)
2. Health and Safety
3. Fire Suppression
4. Emergency Medical
5. Human Resources (Leadership, Supervision, Interpersonal Dynamics, EEO, etc.)
6. Incident Management System
7. Hazardous Materials
8. Technical Rescue
9. Information Systems and Computer Technology
10. Position Specific Development (Firefighter, Company Officer, Chief Officer, Telecommunicator, Investigator, Inspector, Driver Operator, etc.)

A.5.1.4 The use of a structured on-the-job training (OJT) program with close supervision can assist fire departments to utilize new members in non-IDLH environments during emergency operations.

A.5.2.2 Statistics presented by the National Fire Protection Association (NFPA) and the United States Fire Administration (USFA) indicate an alarming trend in the increased number of fire fighter fatalities and injuries associated with vehicle operations. Fire departments respond a variety of apparatus and the members operating this apparatus must have the appropriate knowledge, skills, and abilities to operate this apparatus.

The first step in this process is to properly train and educate members on the various types of apparatus they may be required to operate. NFPA 1451, Standard for a Fire Service Vehicle Operations Training Program provides the curriculum for members to develop the necessary knowledge, skills, and abilities to meet the requirements of this paragraph. The second step is to ensure that the fire department performs an annual proficiency evaluation of all driver/operators as required by Section 5.5. Also the training and education must address the standard operating procedures associated with vehicle operations, especially emergency response.

These are necessary components of the department's plan to reduce the risks associated with vehicle operations. This is a systems approach to ensure for the safety and health of members and the citizens they serve.

A.5.2.6 In the United States, federal regulations require a minimum amount of training for fire service personnel who respond to hazardous materials incidents. These requirements can be found in 29 CFR 1910.120, Hazardous waste operations and emergency response (OSHA) and in 40 CFR 311, Worker protection (EPA). These regulations affect all fire departments in the United States whether full-time career, part-time, combination career and volunteer, or fully volunteer. These regulations apply in all states, and not just in those states with federally approved state OSHA programs.

In the U.S. federal regulations, First Responder Operations Level is defined as follows:

First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposure. First responders at the operational level shall have received at least 8 hr of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed in the awareness level and the employer shall so certify:

- (1) Knowledge of the basic hazard and risk assessment techniques;
- (2) Know how to properly select and use proper personal protective equipment provided to the First Responder Operations Level;
- (3) An understanding of basic hazardous materials terms;
- (4) Know how to perform basic control, confinement, and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit;
- (5) Know how to implement basic decontamination procedures;
- (6) An understanding of the relevant standard operating procedures and termination procedures.

The First Responder Operations Level in both the U.S. federal regulations and NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents, is similar. Whereas the U.S. federal regulations (29 CFR 1910.120 or 40 CFR 311) govern the fire service in every state in the United States, the minimum level of training for all fire fighters must be the First Responder Operations Level.

A.5.2.9 In order to ensure compliance with the minimum requirements of NFPA 1001, Standard for Fire Fighter Professional Qualifications, fire department training programs should be certified through a recognized accreditation system. In addition, NFPA 1405, Guide for Land-Based Fire Fighters Who Respond to Marine Vessel Fires, provides recommended guidelines for those members who respond to marine vessel fires.

A.5.3.5 The essence of any successful respiratory protection training program is the establishment of written operational policies and the re-enforcement of those policies through comprehensive training.

The authority having jurisdiction should ensure that each member demonstrates knowledge of at least the following:

- (1) Why respiratory protection equipment is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
- (2) What the limitations and capabilities of the respiratory protection equipment are
- (3) How to use the respiratory protection equipment effectively in emergency situations, including situations in which the respiratory protection equipment malfunctions
- (4) How to inspect, put on and remove, use, and check the seals of the facepiece
- (5) What the procedures are for maintenance and storage of the respiratory protection equipment
- (6) How to recognize medical signs and symptoms that can limit or prevent the effective use of respiratory protection equipment
- (7) The requirements of Section 7.8

A.5.3.7 Several accidents have occurred where smoke bombs or other smoke-generating devices that produce a toxic atmosphere have been used for training exercises. Where training exercises are intended to simulate emergency conditions, smoke-generating devices that do not create a hazard are required.

A.5.3.8 Fire departments can utilize instructors who are not necessarily trained and/or certified to the requirements of NFPA 1041, Standard for Fire Service Instructor Professional Qualifications. However, in using these instructors they should ensure that they are familiar with the fire department, its organization, and operations and, in addition, are qualified in that particular area of expertise.

A.5.3.9 Members can be trained and/or certified at the local, state, or national level in Support (BLS), or Advanced Life Support (ALS). Jurisdictions can require specialty skills within certain levels.

A.5.3.10 Clothing that is made from 100 percent natural fibers or blends that are principally natural fibers should be selected over other fabrics that have poor thermal stability or ignite easily.

The very fact that persons are fire fighters indicates that all clothing that they wear should be flame resistant (as children's sleepwear is required to be) to give a degree of safety if unanticipated happenings occur that expose the clothing to flame, flash, sparks, or hot substances. This would include clothing worn under their structural firefighting protective ensemble.

A.5.5.3 An annual skills check should address the professional qualification specific to a member's assignment and duty expectation. As an example, a fire fighter is checked for skills required by NFPA 1001, Standard for Fire Fighter Professional Qualifications. A driver/operator would be checked for skills required by NFPA 1002, Standard for Fire Apparatus Driver/Operator Professional Qualifications.

**SUBSTANTIATION:** This is a complete reorganization of this chapter. The material was reorganized to improve the flow of text and separate sections by proper title and content.

The material was rewritten to reflect that as members strive towards various duties and responsibilities in the department, professional development must be included to enhance members' knowledge, skills, and abilities.

A new paragraph was added in Section 5.3 regarding the training requirements in NFPA 1561, Standard on Emergency Service Incident Management System. In addition, all references to the professional qualification standards were revised where necessary to require only those persons who were responsible for actually doing the job at the referenced professional qualification level meet the standard.

New annex material was added to Paragraphs 5.1.1 and 5.2.2 properly explain the goal of any safety and health program is to reduce the frequency and severity of accidents, occupational injuries and illnesses, and eliminating fatalities. Each fire department must develop a structured program to ensure

that all members are trained prior to performing assigned duties and responsibilities.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-12 Log #CP41 **Final Action:** Accept  
(6.1.8 and 6.3.3)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 6.1.8 to read as follows: "Members performing hoist rescue in the passenger area of the aircraft shall be secured by a vehicle safety harness or seat belt system."

Revise 6.3.3 to read as follows: "Members actively performing necessary emergency medical care while the vehicle is in motion shall be secured to the vehicle by a seat belt, or by a vehicle safety harness designed for occupant restraint, to the extent consistent with the effective provision of such emergency medical care."

**SUBSTANTIATION:** The term vehicle safety harness is defined but in these two references, the word "vehicle" needs to be added.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-13 Log #CP6 **Final Action:** Accept  
(6.2.1)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 6.2.1 to read as follows:

6.2.1\* Fire apparatus shall be operated only by members who have successfully completed an approved driver training program commensurate with the type of apparatus the member will operate or by trainee drivers who are under the supervision of a qualified driver.

**SUBSTANTIATION:** The technical committee felt it is imperative that members only operate the apparatus in which that have been properly trained or if they are being trained, they are under the guidance of a qualified driver.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-14 Log #CP7 **Final Action:** Accept  
(6.2.3.2 (New))

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add a new 6.2.3.2 as follows:

6.2.3.2 These rules and regulations shall also apply to the use of emergency lighting equipment and/or audible warning devices on private vehicles.

6.2.3.2.1 The rules and regulations shall specify the procedures for use of emergency lighting equipment and audible warning devices and shall be in compliance with the motor vehicle laws of the jurisdiction.

6.2.3.2.2 Emergency lighting equipment and audible warning devices shall not be installed without the fire department's approval.

Add an annex to 6.2.3.2 to read as follows:

A.6.2.3.2 For more information, see FA-220, Firefighter Fatality Retrospective Study, Federal Emergency Management Agency, United States Fire Administration, April 2002.

**SUBSTANTIATION:** Fire department members that respond in their privately owned vehicle must ensure that these warning devices are both approved by the jurisdiction and authorized by the fire department.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-15 Log #CP8 **Final Action:** Accept  
(6.2.7)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 6.2.7 to read as follows:

6.2.7\* The fire department shall develop standard operating procedures for safely driving fire apparatus during non-emergency travel and emergency response and shall include specific criteria for vehicle speed, crossing intersections, traversing railroad grade crossings, and the use of emergency

warning devices, and the backing of fire apparatus.

Add text to the end of A.6.2.7 to read as follows:

Fire fighter fatality studies describe 10 incidents that occurred from 1984 - 2004 in which fire fighters were killed during the backing of fire apparatus. This is a significant issue that the fire service must address in terms of standard operating procedures, training programs, and implementation.

When fire apparatus is in the backing mode, standard operating procedures need to dictate that members assigned to back apparatus be in communications with the driver/operator. This can be accomplished by using the radio system, intercom system, or other means. Standard operating procedures should dictate that the apparatus not be moved until verbal and visual contact is made with the driver/operator and the backer. Also, standard operating procedures must dictate that the backed be in the line of sight with the driver/operator via the apparatus mirrors on either side of the apparatus. The intent is to ensure that the backing of fire apparatus is accomplished in a safe and effective manner.

Revise 6.2.7.1 to read as follows:

6.2.7.1 Procedures for emergency response all responses shall emphasize that the safe arrival of fire apparatus to at the incident emergency scene is the first priority.

Add annex material to A.6.2.7.1 to read as follows:

Many incidents require the non-emergency response of fire apparatus. Each fire department must identify incidents that do not require the use of warning lights and sirens. Examples of non-emergency incidents can include lockouts, carbon monoxide detectors sounding, a fire reported out, assist law enforcement, backfills or move-ups, and other incidents as determined by the authority having jurisdiction. The intent is to reduce the risk to fire department members and the citizens of the community from unnecessary harm. The response can always be upgraded to emergency response if the situation warrants based upon additional information.

Fire department water tankers (tenders) provide a mobile water supply to support fire fighting and other fire department operations. They are generally used in rural areas without fire hydrant coverage but can also be found in the fleets of many suburban and urban fire departments.

Although their number as a percent of the overall apparatus fleets is small, estimated at just two percent, they are involved in a disproportionate number of crashes that are fatal to firefighters and others. A study of firefighter fatalities from 1990 through 2000 found that fire tankers were the second most common vehicle type involved in crashes that killed firefighters. Tankers/tenders were second only to personal vehicles in the number of fatal crashes.

The United States Fire Administration produced a report entitled "Safe Operation of Fire Tankers" in 2003. The report (FA-248) is available free from the USFA in print and can be downloaded from the USFA web site at [www.usfa.fema.gov](http://www.usfa.fema.gov). The report provides comprehensive information on the safe construction, use, and operation of fire department tankers/tenders. The report dealt with fire apparatus with water tanks sizes of 1,000 gallons or more. The recommendations contained in the report, therefore, can apply to any piece of fire apparatus with a large water tank.

Attention to a small number of operational recommendations can make the operation of fire tankers/tenders safer for firefighters and those that share the road with this type of apparatus.

The following recommendations should become part of standard operating procedures for departments operating tankers (tenders).

(1) Firefighters should always wear seat belts when driving or as the passenger in any vehicle, including tankers/tenders. The firefighter's best chance for survival is to remain with the vehicle during a crash and to be protected by the structure of the vehicle. During the period from 1990 to 2001, 82% of the firefighters killed in tanker/tender crashes were not wearing seat belts.

(2) If the right-hand wheels of the apparatus leave the paved surface of the roadway for any reason, the apparatus should be slowed before attempting to return all wheels to the roadway. In 66% of the fatal tanker/tender crashes from 1990 - 2001, the right wheels of the apparatus left the roadway. If the vehicle is returned to the roadway surface at speed, the apparatus can veer violently to the left, drivers often overcompensate by steering to the right, and the apparatus either begins to roll or leaves the roadway and crashes. Slowing the vehicle prior to returning to the roadway will minimize the chances of such an event.

(3) Slow down. Speed was cited as a factor in 55% of fatal crashes of fire department tankers/tenders from 1990 - 2001. The weight of the water and the weight of the apparatus combine to make fire department tankers/tenders very heavy vehicles. They cannot stop quickly and their handling characteristics are unlike other fire apparatus. The USFA "Safe Operation of Fire Tankers" report recommends that tankers/tenders never be operated over the posted speed limit and that they be controlled to speeds at or less than the cautionary speeds listed on yellow signs on curves.

(4) Make sure that the apparatus is up to the task. Fuel or milk tankers converted to fire department water tankers usually do not have the brake capacity or tank baffles that are needed to transport water - fuel and milk are lighter than water. The total weight of a tanker/tender should not exceed the rated capacity of the vehicle's braking system. In addition to weight concerns, tankers/tenders must be maintained in a ready state. Their mechanical systems must be checked and maintained on a regular basis.

(5) Ensure that driver/operators have the necessary knowledge, skills, and abilities to specifically drive and operate tankers/tenders. Tankers/tenders do not operate or have the same driving characteristics as other fire apparatus. Drivers should be specifically trained on each vehicle and untrained drivers



should not be allowed to operate tankers/tenders.

(6) Drive with the tank completely full or completely empty. Even with proper baffling, a semi-full water tank will allow water to move more freely. This water movement can create control problems for the apparatus operator. If the full tank of water is not used, dump the rest of the load in a safe place and drive the tanker/tender empty until the entire tank can be filled.

**SUBSTANTIATION:** Due to the potential risks involved in the backing of fire apparatus, the technical committee wanted to add text to emphasize the importance of proper backing procedures. Paragraph 6.2.7.1 is being revised and annex material is being added to reflect that all responses, whether emergency or not, need to be done safely.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-16 Log #CP9 **Final Action:** Accept  
(7.2.5 and 7.2.5.1)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 7.2.5. and 7.2.5.1 to read as follows:

7.2.5 The fire department shall adopt and maintain a protective clothing and protective equipment program that addresses the selection, care, maintenance, and safe use of structural fire fighting protective ensembles, and training in its use.

7.2.5.1 The selection, care, and maintenance of protective ensembles for structural fire fighting shall be as specified in NFPA 1851, Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles.

**SUBSTANTIATION:** This will update the referenced text to the requirements as specified in NFPA 1851.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-17 Log #CP30 **Final Action:** Accept  
(7.3.1 and 7.3.1.1)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 7.3.1 to read as follows:

Members whose primary responsibility is proximity fire fighting operations and members who participate in proximity fire fighting training shall be provided with and shall use proximity fire fighting protective ensembles that are compliant with NFPA 1976, Standard on Protective Ensemble for Proximity Fire Fighting.

Delete 7.3.1.1.

**SUBSTANTIATION:** This updates the requirement for who needs to use proximity fire fighting protective ensembles and requires use of full proximity fire fighting protective clothing.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-18 Log #CP39 **Final Action:** Accept  
(7.4.1, 7.4.2)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 7.4.1 to read as follows:

7.4.1 Members who perform emergency medical care or are otherwise likely to be exposed to blood or other body fluids shall be provided with emergency medical garments, emergency medical face protection devices, emergency medical examination gloves, emergency medical work gloves, and emergency medical footwear or emergency medical footwear covers that meet the applicable requirements of are compliant with NFPA 1999, Standard on Protective Clothing for Emergency Medical Operations.

Revise 7.4.2 to read as follows:

7.4.2\* Members shall wear emergency medical examination gloves when providing emergency medical care.

Revise A.7.4.2 to read as follows:

A.7.4.2 In order to avoid all potential exposure to infectious diseases, it is important that all members use medical gloves when providing patient care. All members who could come in contact with the patient should use medical gloves.

**SUBSTANTIATION:** These changes bring the terminology and requirements for the use of emergency medical protective clothing in NFPA 1500 in line with NFPA 1999.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-19 Log #CP31 **Final Action:** Accept  
(7.4.5)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 7.4.5 to read as follows:

7.4.5 Contaminated emergency medical protective clothing shall be cleaned and disinfected or disposed of as specified in NFPA 1581, Standard on Fire Department Infection Control Program.

Add a new 7.4.5.1 and 7.4.5.2 to read as follows:

7.4.5.1 Emergency medical examination gloves and emergency medical footwear covers shall not be reused and shall be disposed of after each use.

7.4.5.2 Any item of emergency medical protective clothing that is not designated for "multiple use" shall not be reused and shall be disposed of after each use.

**SUBSTANTIATION:** This updates the requirement for the cleaning and disinfecting of, or disposal of, protective clothing used by persons providing emergency medical care.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-20 Log #CP10 **Final Action:** Accept  
(7.8.1, 7.8.1.1 and 7.8.1.2)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 7.8.1 (numbered as 7.9.1 in the draft) to read as follows:

The fire department shall adopt and maintain a respiratory protection program that addresses the selection, care, maintenance, and safe use of respiratory protection equipment, medical surveillance, training in respirator its use, and the assurance of air quality.

Add a new 7.8.1.1 (numbered as 7.9.1.1 in the draft) to read as follows:

The selection, care, and maintenance of open-circuit SCBA shall be as specified in NFPA 1852, Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA).

Add a new 7.8.1.2 (numbered as 7.9.1.2 in the draft) to read as follows:

Training in respirator use shall include knowledge of hazards, hazard assessment, selection of proper respiratory protective equipment based on hazard exposure levels, proper fit testing of respirators, and respirator inspection.

Revise A.7.8.2 to be annex to 7.8.1.1 (shown as A.7.9.1.1 in the draft) to read as follows:

Selection of respiratory protection devices is an important function, particularly where resources are limited and respirators have to be used for different applications with different equipment. USAR, CBRN, confined space, hazardous materials, and other operations can require different filter elements, SCBA breathing air cylinders, umbilical connections, and features that are easier to ascertain and coordinate with a selection stage.

Add "NFPA 1852, Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA), 2002 edition" to Section 2.2.

**SUBSTANTIATION:** These changes reference the text to the requirements as specified in NFPA 1852 which is a new document since the last edition of NFPA 1500.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-21 Log #CP11 **Final Action:** Accept  
(7.9)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise section 7.9 (numbered as 7.10.1 in the draft) to read as follows:

Breathing Air. Breathing air used to fill SCBA cylinders shall meet the requirements specified in NFPA 1989, Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection.

Delete 7.9.2 through 7.9.5.

Add NFPA 1989, Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection as a referenced publication in Chapter 2.

Delete the reference to ANSI/CGA G7.1, Commodity Specification for Air, in chapter 2.

**SUBSTANTIATION:** Paragraph 7.9.1 was changed to require breathing air to meet the requirements of NFPA 1989, Standard on Breathing Air Quality for Fire and Emergency Services which makes paragraphs 7.9.2 through 7.9.5 unnecessary as that material is in NFPA 1989. With this change, the reference to ANSI/CGA G7.1 is no longer needed in chapter 2 but a reference to NFPA 1989 is needed.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-22 Log #CP12 **Final Action:** Accept  
(7.10.1.1)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 7.10.1.1 (numbered as 7.11.1.2 in the draft) to read as follows:

Open-circuit SCBA that does not meet the 1992 or later editions of NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service, shall be removed from fire service use.

**SUBSTANTIATION:** The 1992 edition of NFPA 1981 includes a total flame and heat test, representative of a flashover condition, and third-party testing, neither of which were included in the 1987 edition of the standard. Their inclusion provides for more heat resistant SCBA and also for testing and certification by unbiased, nationally recognized test agencies.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-23 Log #CP33 **Final Action:** Accept  
(7.10.1.1 (New) )

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add a new requirement as 7.10.1.1 (numbered as 7.11.1.1 in the draft) to read as follows:

All open-circuit SCBA that is purchased new shall be certified as compliant with NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services and shall also be certified by NIOSH as compliant with NIOSH Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Open Circuit Self-Contained Breathing Apparatus (SCBA).

Renumber existing 7.10.1.1 through 7.10.1.3 as 7.10.1.2 through 7.10.1.4. (7.11.1.2 through 7.11.1.4 in the draft).

**SUBSTANTIATION:** It is important that newly purchased SCBA meet the current edition of NFPA 1981 and in addition meets the NIOSH CBRN regulation. This regulation requires SCBA to provide respiratory protection against exposure to sarin and mustard gas, representative of potential terrorist agents. Approval to NFPA 1981 and the NIOSH regulation represents the highest level of respiratory protection available today for first responders.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-24 Log #CP42 **Final Action:** Accept  
(7.10.2.2)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 7.10.2.2 (numbered as 7.11.2.2 in the draft) to read as follows:

Supplied-air respirators, other than SCBA shall not be used in IDLH atmospheres unless equipped with a NIOSH-certified emergency escape air cylinder and a pressure-demand facepiece.

**SUBSTANTIATION:** This requirement does not apply to SCBA and is being modified to reflect that fact.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-25 Log #CP44 **Final Action:** Accept  
(7.13 (New) )

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add a new section as 7.13 in the draft to read Using Respiratory Protection.

Add a new 7.13.1 to read "Respirators shall not be worn when a member has any conditions that prevent a good face seal."

Renumber 7.12.7 through 7.12.15 as 7.13.2 through 7.13.10.

**SUBSTANTIATION:** Splitting the material in current section 7.12 between fit testing and using respiratory protective devices organizes the material better. Also, the addition of a requirement that restricts a member from wearing a respirators when that member has any conditions that prevent a good face seal has been implied but not stated.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-26 Log #CP32 **Final Action:** Accept  
(7.13.2)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add new text as 7.13.2 (numbered as 7.15.2 in the draft) to read as follows:

7.13.2 New SCBA purchased by fire departments shall include an integrated PASS .

Renumber 7.13.2 and 7.13.3 as 7.13.3 and 7.13.4. (7.15.3 and 7.15.4 in draft).

Move the first 2 paragraphs of A.7.13.1 to be annex to current A.7.13.2 (shown as A.7.15.3 in the draft) and revise by adding an additional sentence to the end of the second paragraph to read as follows:

Training and operational procedures are imperative to ensure activation of all units whenever stand-alone PASS devices are used.

Move the last paragraph of A.7.13.1 to be annex to the new 7.13.2 (shown as A.7.15.2 in the draft) and revise by deleting the sentence that reads "Fire departments are encouraged to utilize this technology."

**SUBSTANTIATION:** The use of stand alone PASS units during operations that require SCBA usage provide protection only if they are always worn and always activated. Failure to don the stand alone PASS, or failing to activate it eliminates the protection which it was intended to provide. A PASS integrated into the SCBA makes it impossible to forget, and ensures that it is activated when the SCBA is in the operational mode. Firefighter protection is increased via the use of integrated PASS devices.

With the inclusion of integrated PASS devices in the body of the standard, the annex that "encouraged" its use is no longer necessary. Other changes are to better align annex material with the requirement and to be sure training and operational procedures are in place for stand-alone use of PASS devices.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-27 Log #CP13 **Final Action:** Accept  
(7.15.3)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 7.15.3 (numbered as 7.17.3 in the draft) to read as follows:

When operating in the hazardous area at an emergency scene without the full facepiece or respiratory protection being worn, members shall ~~deploy the helmet goggles for~~ wear appropriate eye protection.

**SUBSTANTIATION:** When operating in a hazardous area, eye protection of the type appropriate for the hazard must be utilized by members.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-28 Log #CP14 **Final Action: Accept**  
(7.17.3)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 7.17.3 (renumbered as 7.19.3 in the draft) to read as follows:

Members' personal protective ensembles ~~manufactured prior to the 1986 edition of NFPA 1971, Standard on Protective Ensemble for Structural Fire Fighting,~~ shall be taken out of removed from service after 15 years from date of manufacture, regardless of testing or inspection procedures.

**SUBSTANTIATION:** The technical committee believes that 15 years is more than an adequate life for personal protective ensembles. Only destructive testing can determine the safety of the garment. Over time materials used in outer shells and moisture barriers will degrade. Over the past 15 years, materials have improved, garments are designed to prevent the intrusion of blood borne pathogens, breathable moisture barriers have become standard, and third party testing of garments is now required.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS,

PREZANT, TUREN, ZAGARIS

1500-29 Log #CP15 **Final Action: Accept**  
(8.2)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add a new section title as 8.2 to read Communications.

Renumber existing text 8.1.9 through 8.1.12.2 as 8.2.1 through 8.2.4.2.

**SUBSTANTIATION:** Placing this text in its own section emphasizes the importance of proper communication during fire department operations.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS,

PREZANT, TUREN, ZAGARIS

1500-30 Log #CP35 **Final Action: Accept**  
(8.3.10)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 8.3.10 (numbered as 8.4.10 in the draft) to read as follows:

The fire department shall develop, implement, and utilize the system components required to make the personnel accountability system effective.

Revise A.8.3.10 (numbered as A.8.4.10 in the draft) to read as follows:

The personnel accountability system is a method of maintaining constant awareness of the identities and location of all personnel involved in emergency operations. The personnel accountability system philosophy starts with the Incident Command System principles of company unity and unity of command. These duties can be fulfilled initially maintaining company accountability by documenting the situation status and resource status on the tactical worksheet. Other methods include command boards, apparatus riding lists, company personnel boards, and electronic bar-coding systems. These components can be used in conjunction with one another to facilitate the tracking of personnel by both location and function. The components of the personnel accountability system should be modular and expand with the size and complexity of the incident.

At major incidents, this function should be separate from the role of the incident commander. The function of personnel accountability should be assigned to an accountability officer (resource status and situation status) who is responsible for maintaining the status of all assigned resources at an incident. As the incident escalates, this function would be placed under the planning section.

**SUBSTANTIATION:** Fire fighter accountability is a critical component to ensure for the safety of all members operating at an emergency incident or training exercise. The new language requires that a fire department have procedures in place to effectively account for all members. This function is separate from the roles and responsibilities of the incident commander. The annex material describes methods that can be implemented to maintain accountability at an emergency incident.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS,

PREZANT, TUREN, ZAGARIS

1500-31 Log #CP16 **Final Action: Accept**  
(8.4)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Change wording "hazard area" to "hazardous area" where used in Section 8.4.

**SUBSTANTIATION:** This will make the wording consistent and use wording that is defined in Chapter 3. See also Proposal 1500-5 (Log #CP4) which revises the definition of hazardous area.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS,

PREZANT, TUREN, ZAGARIS

1500-32 Log #CP17 **Final Action: Accept**  
(8.4.19 and 8.4.20)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Renumber text in 8.4.19 as 8.4.18.1 and 8.4.20 as 8.4.18.2. (see 8.5.18.1 and 8.5.18.2 in the draft)

**SUBSTANTIATION:** Clarifies text and reduces confusion as to the content of the material.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS,

PREZANT, TUREN, ZAGARIS

1500-33 Log #CP18 **Final Action: Accept**  
(8.5 (New) )

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add a new section after current section 8.4 (numbered as 8.7 in the draft) to read as follows:

8.5\* Roadway Incidents.

8.5.1 When members are operating at an emergency incident and their assignment places them in potential conflict with motor vehicle traffic all efforts shall be made to protect the members.

8.5.2 Each department shall establish, implement and enforce, standard operating procedures regarding emergency operations for highway incidents.

8.5.3 Apparatus and warning devices shall be placed to take advantage of topography and weather conditions (uphill / upwind) and to protect firefighters from traffic.

8.5.4 Fire apparatus shall be positioned in a blocking position, so if it is struck, it will protect members and other persons at the incident scene.

8.5.5 Fluorescent and retro-reflective warning devices such as traffic cones with DOT-approved retro-reflective collars, DOT-approved retro-reflective signs, illuminated warning devices such as highway flares, or other appropriate warning devices shall be used to warn oncoming traffic of the emergency operations.

8.5.6 The first arriving unit shall ensure that traffic is controlled before addressing the emergency operations.

8.5.7 Members shall position themselves and any victims in a secure area.

8.5.8 Members shall park or stage unneeded fire apparatus and personal vehicles off the roadway whenever possible.

8.5.9\* When members are operating at a roadway incident and their assignment places them in potential conflict with motor vehicle traffic, they shall wear a garment with fluorescent and retro-reflective material visible from all directions.

8.5.10 Members used for control traffic purposes shall receive training that is commensurate with their duties and in accordance with any applicable state and local laws and regulations.

A.8.5.10 Proper training on traffic control can be obtained from local or state highway departments, law enforcement, and other agencies involved with the controlling roadway traffic.

Delete existing text 8.4.25 through 8.4.27.

Add an annex to A.8.5 to read as follows:

A.8.5 For additional information on establishing safe practices at highway incidents, see IFSTA publication, Incident Management System Model Procedures Guide for Highway Incidents; USFA Publication FA-272, Emergency Vehicle Safety Initiative, and DOT publication, Manual on Uniform Traffic Control Devices for Streets and Highways, Chapter 61.

Add an annex to A.8.5.9 to read as follows:

A.8.5.9 Members that operate on roadway incidents should be provided with vests or garments that ensure proper reflectivity such as a highly retro-reflective vest (strong yellow green and orange ).

**SUBSTANTIATION:** Fire fighters are killed and injured each year at roadway incidents. The committee has created a new section on highway incidents and expanded the requirements in 8.4.25 through 8.4.27 to provide increased requirements to emphasize the importance of proper safety precautions at roadway incidents and thus improve the safety of members operating at these incidents.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-34 Log #CP37 **Final Action:** Accept  
(8.5 (New))

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add a new section after section 8.4 (numbered as 8.6 in the draft) to read as follows:

8.5 Control Zones.

8.5.1 Control zones shall be established at emergency incidents.

8.5.1.1 The perimeters of the control zones shall be designated by the incident commander and communicated to all members.

8.5.1.2 If the perimeters of the control zones change during the course of the incident, these changes shall be communicated to all members on the scene.

8.5.2\* Hazard control zones shall be designated as hot, warm and cold.

8.5.2.1 All members shall wear all of the appropriate PPE (SCBA, flash hood, etc.) while in the hot zone.

8.5.2.2\* All members operating within the hot zone shall have an assigned task. Where an exclusion zone is designated, no personnel shall enter the exclusion zone due to imminent hazard(s) or the need to protect evidence.

Add an annex to the new 8.5.2 to read as follows:

A.8.5.2 The hot zone is the area presenting the greatest risks to members and will often be classified as an IDLH (immediately dangerous to life and health) atmosphere. Hot zone may include exclusion zones. Examples of exclusion zones could be holes in floors, explosive devices, crime scenes etc.

The warm zone is a limited access area for members directly aiding or in support of operations in the hot zone. Significant risk of human injury (respiratory, exposures etc.) may still exist in a warm zone.

The cold zone establishes the public exclusion or clean zone. There are minimal risks for human injury and or exposure in this zone.

Wherever possible, control zones should be identified with colored hazard tape, signage, cones, flashing beacons, fences or other appropriate means. However, because of the nature or location of the incident, available resources, or other considerations, it may not always be possible or practical to mark the control zones.

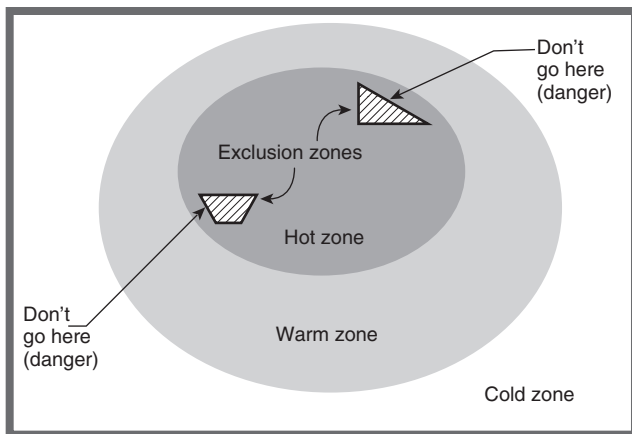


Figure A.8.5.2 Example of control zones

Add an annex to the new 8.5.2.2 to read as follows:

A.8.5.2.2. Members entering the hot zone without an assigned task are placing themselves at greater risk for no reason. In addition they may be increasing the risk of others operating

Add 4 definitions after 3.3.9 to read as follows:

3.3.10 Control Zones. The areas at an incident that are designated based upon safety and the degree of hazard.

3.3.10.1 Cold Zone. The control zone of an incident that contains the command post and such other support functions as are deemed necessary to control the incident.

3.3.10.2 Hot Zone. The control zone immediately surrounding a hazardous area, which extends far enough to prevent adverse effects to personnel outside

the zone.

3.3.10.3 Warm Zone. The control zone outside the hot zone where personnel and equipment decontamination and hot zone support takes place.

Delete 3.3.32 and its annex which is the current definition of hot zone.

**SUBSTANTIATION:** This system is to be used during structural fire fighting to enhance the safety of members operating at emergency incidents. This system is similar to the system used during hazardous materials mitigation operations. The intent is to define control zones for ensuring members are wearing and using the proper personal protective clothing and equipment when working in a particular control zone as designated by the incident commander.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-35 Log #CP20 **Final Action:** Accept  
(8.6)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Delete the last 3 sentences of A.8.6.1

Revise 8.6.2 (numbered as 8.9.2 in the draft) to read as follows:

The incident commander shall consider the circumstances of each incident and initiate rest and rehabilitation in accordance with the standard operating procedures and with NFPA 1561, Standard on Emergency Services Incident Management System.

Add an annex to 8.6.2 (numbered as A.8.9.2 in the draft) to read as follows:

See NFPA 1584, Recommended Practice on Rehabilitation of Members Operating at Incident Scene Operations and Training Exercises for guidelines for implementing incident scene rehabilitation.

Revise 8.6.3 (numbered as 8.9.3 in the draft) to read as follows:

Such on-scene rehabilitation shall include at least rest, hydration, active cooling where required, basic life support care, food where required, and protection from extreme elements.

Combine A.8.6.2 and A.8.6.3 and revise to read as follows (numbered as A.8.9.3 in the draft):

Rest should be provided away from potentially toxic exposures and loud noises, preferably with the opportunity to dress down and sit down.

Adequate water supplies should allow for up to 1 quart (1 Liter) per person for incidents lasting an hour or more. Water must be potable, such as sealed individualized plastic bottles. Avoid caffeinated and high sugar beverages.

In hot humid conditions, and/or where members have been working hard for more than 40 minutes, a means to actively cool core body temperature should be provided to prevent heat stress. Forearm immersion in cool water, misting fans, cooling vests etc. are types of active cooling. For more information on active cooling, see "Current Fire Fighter Occupational Medicine Issues, Approaches for Fire Fighter Rehabilitation" by Dr. Tom McLellan.

Medical evaluation and treatment in the on-scene rehabilitation area should be conducted according to EMS protocols developed by the fire department in consultation with the fire department physician and the EMS medical director. If ALS personnel are available, this level of EMS care is preferred.

The assignment of an ambulance or other support crew to the rehabilitation function is essential during long-duration or heavy-exertion incident operations. This crew can assist with rehabilitation functions as well as be available to provide immediate life support needs for members.

Food should be made available for longer duration incidents (more than three hours). If possible supplied food should be nutritious. Members should be provided with a means to wash contaminants from their hands and faces before refueling.

Weather factors during emergency incidents can impact severely on the safety and health of members, particularly during extremes of heat or cold. Where these factors combine with long-duration incidents or situations that require heavy exertion, the risks to members increase rapidly. The fire department should develop procedures, in consultation with the fire department physician, to provide relief from adverse climatic conditions.

Typical rehabilitation considerations for operations during hot weather extremes are as follows:

- (1) Moving fatigued or unassigned personnel away from the hazardous area of the incident
- (2) Removal of personal protective equipment
- (3) Ensuring that personnel are out of direct sunlight
- (4) Ensuring that there is adequate air movement over personnel, either naturally or mechanically.
- (5) Provide for active cooling by using forearm immersion, misting fans or other devices proven to quickly and effectively lower a members' core body temperature to avoid heat stress.
- (5) Providing personnel with fluid replenishment, especially water
- (6) Providing medical evaluation for personnel showing signs or symptoms of heat exhaustion or heat stroke
- (7) Provide a change of clothing and possibly a change of protective garments.

Typical rehabilitation considerations for operations during cold weather extremes are as follows:

- (1) Moving fatigued or unassigned personnel away from the hazardous area of the incident
- (2) Providing shelter from wind and temperature extremes
- (3) Providing personnel with fluid replenishment, especially water
- (4) Providing medical evaluation for personnel showing signs or symptoms of frostbite, hypothermia, or other cold-related injury
- (5) Provide a change of clothing and possibly a change of protective garments.

Add a reference in H.1.2 to the following

Dr. Tom McLellan, Defense Research and Development Canada, "Current Fire Fighter Occupational Medicine Issues, Approaches for Fire Fighter Rehabilitation", September 2003, IAFF John P. Redmond Foundation Health and Safety Seminar, San Francisco

Delete the words "and rest" in 8.6.4.

**SUBSTANTIATION:** The rehabilitation component during emergency operations is essential to the safety and health of members operating at the incident. A reference to NFPA 1584 was added as this is a new recommended practice that was adopted since the last edition of the standard.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-36 Log #CP19 **Final Action:** Accept  
(8.7)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Change the title of section 8.7 (numbered as 8.10 in the draft) to read as follows:

Scenes of Violence, Civil Unrest, or Terrorism.

**SUBSTANTIATION:** The title better describes the text in the section as to the type of incidents the fire department responds regarding violence, civil unrest, or terrorism.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-37 Log #CP21 **Final Action:** Accept  
(8.7.1)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Replace existing 8.7.1 (see 8.10.1 and 8.10.2 in the draft) with the following text.

8.7.1.\* Fire department members shall not become involved in any activities at the scene of domestic disturbance, civil unrest or similar situations where there is ongoing violence without the confirmed presence of law enforcement personnel who have deemed the scene secure.

8.7.2. Under no circumstances shall fire department equipment or personnel be used for crowd control or dispersement purposes.

Add an annex to the new 8.7.1 (numbered as A.8.10.1 in the draft) to read as follows:

A.8.7.1. Fire department members should not enter environment where there is ongoing violence, or the threat of violence such as persons with weapons; without coordination with law enforcement personnel. This does not necessarily limit the ability of cross trained fire/law enforcement personnel or specialty trained EMS personnel from entering a violent scene to assist the law enforcement or fire department responders.

Renumber existing 8.7.2 going forward as 8.7.3 going forward (see text starting at 8.10.3 in the draft.)

Move 8.2.6 to be the paragraph after existing 8.7.9 (shown as 8.10.11 in the draft) and revise to read:

At civil disturbances or similar incidents where protective equipment generally considered as law enforcement related such as body armour shall be utilized only by members who are trained and qualified to use such equipment.

**SUBSTANTIATION:** Fire departments are increasingly being called to incidents that involve domestic and other acts of violence as they are the EMS providers. Firefighters have been injured and even killed in at such incidents. The committee is adding text to establish that fire department personnel must not become involved in such situations until law enforcement personnel have deemed the scene safe. Other changes are to get all text regarding scenes of violence, civil unrest, or terrorism in one section.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-38 Log #CP45 **Final Action:** Accept  
(9.1.4)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 9.1.4 to read as follows: "All existing and new fire department facilities shall have carbon monoxide detectors installed in locations in sleeping and living areas, such that any source of carbon monoxide would be detected before endangering the members."

Add an annex as A.9.1.4 to read as follows: "The intent is to ensure that members assigned to these fire department facilities are protected by carbon monoxide detectors, especially in areas where the members are sleeping. NFPA 720, Recommended Practice for the Installation of Household Carbon Monoxide Warning Equipment, can serve as a reference."

**SUBSTANTIATION:** As currently worded, the requirement for carbon monoxide detection in ambiguous. As there is no standard to reference, the committee is adding clarification of the requirement and intent.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-39 Log #CP22 **Final Action:** Accept  
(9.1.7 (New) )

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add new text after 9.1.6 to read as follows:

9.1.7 Any components of the protective ensemble that are contaminated shall not be allowed in sleeping and living areas.

Renumber 9.1.7 as 9.1.8.

**SUBSTANTIATION:** It is important for health reasons to prevent contamination of living and sleeping areas from contaminated fire fighter's protective ensembles.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-40 Log #CP23 **Final Action:** Accept  
(9.1.8 (New) )

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add a new 9.1.8 (numbered as 9.1.9 in the draft) to read as follows:

9.1.8 Stations utilizing poles to provide rapid access to lower floors shall ensure that the area around the pole hole is secured by means of a cover, enclosure or other means to prevent someone from accidentally falling through the pole hole.

Add an annex to the new 9.1.8 (numbered as A.9.1.9 in the draft) to read as follows:

A.9.1.8 As part of the fire station inspection program, the areas around the pole hole and the padding at the bottom of the pole should be regularly checked to ensure for the safety of members using the pole.

**SUBSTANTIATION:** Statistics have shown that injuries and fatalities have been associated with the poles in fire stations. It is imperative that the necessary safety precautions be taken to prevent needless accidents involving members.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-41 Log #CP24 **Final Action:** Accept  
(10.2.3, 10.2.4, and 10.2.6)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise 10.2.3 to read as follows:

Candidates shall be certified by the fire department as meeting the physical performance requirements specified in NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Fighters*, prior to entering into a training program to become a fire fighter.

Revise 10.2.4 to read as follows:

10.2.4 Members who engage in emergency operations shall be annually evaluated and certified by the fire department as meeting the physical performance requirements specified in NFPA 1583.

Revise 10.2.6 to read as follows:

10.2.6 Members who are unable to meet the physical performance requirements specified in NFPA 1583 shall enter a physical performance rehabilitation program to facilitate progress in attaining a level of performance commensurate with the individual's assigned duties and responsibilities.

**SUBSTANTIATION:** Where 10.2.1 requires the fire department to develop physical performance requirements, the other paragraphs should refer to those requirements, not just arbitrarily to NFPA 1583. Revised text clarifies the intent of Section 10.2 regarding physical performance requirements.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-42 Log #CP25 **Final Action:** Accept  
(10.7 (New))

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add a new section 10.7 to read as follows:

10.7 Fitness for Duty Evaluations.

10.7.1 Fire departments shall establish a process to evaluate the ability of a member to perform essential job functions.

10.7.2 The process shall evaluate the fitness of a member to perform essential job functions shall be conducted by an appropriate medical professional and confirmed by the fire department physician.

10.7.3 When a member is determined to be unable to perform the essential job functions, the member shall be provided adequate assistance and/or treatment intended to return the member to condition that will allow them to perform the essential job functions.

10.7.4 A member that has been determined to be unable to perform the essential job functions will only be returned to duty when an appropriate medical professional has confirmed that the member can perform the essential job functions.

**SUBSTANTIATION:** A fire department must have a method to evaluate members returning to full duty from an illness, injury, or other situation in which the member has not been allowed to function in a full duty capacity.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-43 Log #CP28 **Final Action:** Accept  
(A.4.2.1)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise A.4.2.1 to read as follows:

A.4.2.1 The risk management plan should consider all fire department operations, the duties and responsibilities of members (uniform and civilian), and policies and procedures. The risk management plan should include goals and objectives to ensure that the risks associated with the daily operations of the fire department are identified and effectively managed.

A primary purpose of the risk management plan is to focus efforts on incidents which may not occur very often (low frequency) but which may have severe consequences associated with them (high risk). The reason for the focus on low frequency/high risk incidents is that since they do not occur on a frequent basis responders may not be as prepared to deal with them, and the outcomes can be harmful or detrimental to fire fighters. Examples of low frequency/high risk events could include high rise fires, technical rescues, multi-alarm fires, or a mass casualty incidents.

For additional guidance on the development of a risk management plan, see NFPA 1250, Recommended Practice in Emergency Service Organization Risk Management.

Delete table A.4.2.1.

**SUBSTANTIATION:** The revised text makes it clear that the risk management plan is to address all personnel, including civilian employees, and all activities, not just emergencies. Table 4.2.1 was removed since the committee believed that it may have prevented users from addressing all of their own risks because only a limited number of examples were listed.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-44 Log #1 **Final Action:** Reject  
(A.4.2.2(6))

**This Proposal appears as Comment 1500-55 (Log # 3) which was held from the F2001 ROC on Proposal 1500-15**

**SUBMITTER:** Wayne Waggoner, Southern Regional Fire Code Dev. / Rep. Southern Regional Fire Code Dev.

**RECOMMENDATION:** Add the following text to this

X.X Fire Fighter Building Safety Marking System.

X.X.1 General.

X.X.1.1 The fire fighter building safety marking system provides basic building information for fire fighters responding to the building or structure.

X.X.1.2 All buildings and structures, except for one- and two-family dwellings, shall have the fire fighter building safety marking system installed in a location(s) approved by the fire department.

X.X.1.3 The fire fighter building safety marking system shall be readily visible from the street or fire lane or as approved by the fire department.

X.X.1.4 The fire fighter building safety marking system shall be made of a white reflective background with black letters of a durable material and permanently affixed to the building or structure in an approved manner.

X.X.2 Sign.

X.X.2.1 The fire fighter building safety marking system shall be a Maltese cross as shown in Figure X.X.2.1.

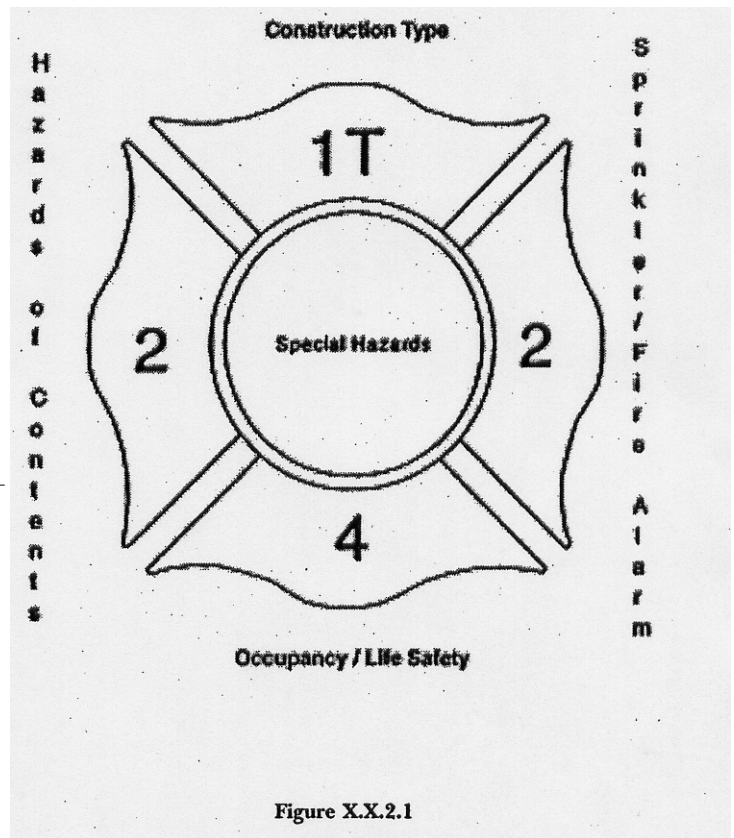


Figure X.X.2.1

X.X.2.2 The size of the assigned ratings shall be in accordance with Table X.X.2.2 or as approved by the fire department.

**Arrangement and order of hazard ratings— optional form of application**

Distance at which hazard ratings must be legible	Minimum size of hazard ratings required
50 ft (15.24 m)	1 in. (2.54 cm)
75 ft (22.86 m)	2 in. (5.08 cm)
100 ft (30.48 m)	3 in. (7.62 cm)
200 ft (60.96 m)	4 in. (10.16 cm)
300 ft (91.44 m)	6 in. (15.24 cm)

Table X.X.2.2

X.X.3 Ratings.

X.X.3.1 Ratings shall be determined by the Construction Type, Hazards of Contents, Automatic Fire Sprinkler Systems and Fire Alarms Systems, Occupancy/Life Safety, and Special Hazards in accordance with this section as approved by the authority having jurisdiction.

X.X.3.2\* Construction Type. The construction type shall be rated by determining its construction type and assigning the appropriate rating to the top of the Maltese cross.

- 1 – Fire Resistive Type I(443) and I(332)
- 2 – Noncombustible Type II(222)
- 3 – Ordinary Type II(111) and III(211)
- 4- Heavy Timber Type IV(2HH)
- 5 – Noncombustible(no ratings), Wood Frame Type II(000), III(200) and V(000)

- T – Unprotected Truss Construction
- V – Unprotected Vertical Openings

A.X.X.3.2 Type I – Fire Resistive, Type II – Noncombustible, Type III – Ordinary, Type IV – Heavy Timber, Type V – Wood Frame. Arabic Numbers: First Arabic Number. Exterior bearing walls, Second Arabic Number. Columns, beams, girders, trusses and arches, supporting bearing walls, columns, or loads from more than one floor, Third Arabic Number. Floor construction.

X.X.3.3 Hazards of Contents. The hazards of contents shall be rated by determining its hazard and assigning the appropriate rating to the left of the Maltese cross.

- 1 – Low Hazard - Low hazard contents shall be classified as those of such low combustibility that no self-propagating fire therein can occur or where the quantity and/or combustibility of contents is low and fires with relatively low rates of heat release are expected.
  - 2 – Ordinary Hazard - Ordinary hazard contents shall be classified as those that are likely to burn with moderate rapidity or to give off a considerable volume of smoke or where combustibility is low, quantity of combustibles is moderate, stockpiles of combustibles do not exceed 8 ft (2.4 m), and fires with moderate rates of heat release are expected.
  - 3 – Moderate Hazard - Moderate hazard contents shall be classified as those that are likely to burn with moderate rapidity or to give off a considerable volume of smoke or where the quantity and combustibility of contents is moderate to high, stockpiles do not exceed 12 ft (3.7 m), and fires with moderate to high rates of heat release are expected.
  - 4 – High Hazard - High hazard contents shall be classified as those that are likely to burn with extreme rapidity or from which explosions are likely.
  - 5 – Extra Hazard - Extra Hazard contents shall be classified as those where the quantity and combustibility of contents is very high and dust, lint, or other materials are present, introducing the probability of rapidly developing fires with high rates of heat release but with little or no combustible or flammable liquids or with moderate to substantial amounts of flammable or combustible liquids or occupancies where shielding of combustibles is extensive.
- X.X.3.4 Automatic Fire Sprinkler/Fire Alarms. The automatic fire sprinkler and fire alarm systems shall be rated by determining its level of protection and assigning the appropriate rating to the right of the Maltese cross.

- 1 – Automatic Fire Sprinkler and Fire Alarm System installed throughout
- 2 – Automatic Fire Sprinkler System installed throughout
- 3 – Partial Automatic Fire Sprinkler System installed
- 4 – Fire Alarm System installed throughout
- 5 – None

X.X.3.5 Occupancy/Life Safety. The occupancy/life safety type shall be rated by determining the occupancy type and assigning the appropriate rating to the bottom of the Maltese cross.

- 1 – Day Care, Detention and Correction Institutes, Health Care
- 2 – Ambulatory Health Care, Assembly, Board and Care, Educational
- 3 – Apartment, Hotel and Dormitories, Lodging and Rooming Houses
- 4 – Business, General Industrial, Mercantile
- 5 – Storage, Special Purpose Industrial, High Hazard Industrial

L – Unusual Life Hazard

X.X.3.6\* Special Hazards. The special hazards can be assigned to the center of the Maltese cross.

704 system

DNE – Do not enter

A-X.X.3.6 The NFPA 704 system can be incorporated into this marking system as long as all the requirements of NFPA 704 are met.

**SUBSTANTIATION:** This Fire Fighter Building Safety Marking System was developed by the Southern Regional Fire Code Development Committee and has been submitted to NFPA 5000, and NFPA 1 for inclusion in their respective documents. We believe that it should be added into 1500 as an appendix item to assist fire departments that want to require a marking system.

**COMMITTEE MEETING ACTION: Reject**

**COMMITTEE STATEMENT:** Putting this in the annex of NFPA 1500 will not get it used or adopted. This needs to be adopted as part of NFPA 1, Uniform Fire Code to get it into use. The submitted text is not written appropriately for annex material as it uses mandatory language. The committee feels that its current Annex C addresses some of the submitters concerns.

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-45 Log #CP34 **Final Action: Accept**  
(A.7.11.1)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Revise the first sentence of A.7.11.1 (numbered as A.7.12.1 in the draft) to read as follows:

Procedures for fit testing are given in 29 CFR 1910.134 and in ANSI Z88.2, Practices for Respiratory Protection.

Delete the second sentence in its entirety.

Change the reference in the third sentence from ANSI Z88.5 to ANSI Z88.2. Add a new paragraph before the existing paragraph to read:

Proper respiratory protection programs include provisions for conducting a respirator fit-testing to ensure that the respirator fits the user properly. Fit testing is a procedure used to evaluate how well a given respirator fits a given person by assessing leakage around the face seal; fit testing can either be qualitative (i.e., relying on a subjective response of the wearer) or quantitative (i.e., using a measurement of actual leakage). Without fit testing, persons unknowingly may have poor face seals, allowing contaminants to leak around the mask and be inhaled. Poor face seals are due to certain facial characteristics (facial size, beards, large sideburns, scars, or other facial uniqueness) which prevent direct contact between the skin and the sealing surface of the respirator and results in leakage or inadequate respiratory protection.

**SUBSTANTIATION:** ANSI Z88.5 has been withdrawn and ANSI Z88.2 is the correct reference. In addition 29 CFR 1910.134 needs to be mentioned as it specifies the appropriate fit testing methods. The second sentence is being deleted as it is incorrect. 29 CFR 1910.134 specifies the appropriate fit testing methods.

The new first paragraph adds additional information on fit testing for the user of this document.

**COMMITTEE MEETING ACTION: Accept**

**NUMBER ELIGIBLE TO VOTE: 33**

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

---

1500-46 Log #CP43 **Final Action: Accept**  
(A.8.1.5)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add a second paragraph to the annex to A.8.1.5 to read as follows:

Due to the high number of fire fighter injuries and deaths attributable to lack of or poor implementation of the safety function on the incident scene, the incident commander should recognize the importance of integrating the safety function into the incident command structure as described in NFPA 1561.

**SUBSTANTIATION:** The technical committee is adding annex material to emphasize the need to integrate the safety function into the incident management system to reduce injuries and deaths to firefighters.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-47 Log #CP40 **Final Action:** Accept  
(A.8.1.7)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add annex material to 8.1.7 to read as follows:

Due to the high number of fire fighter injuries and deaths attributable to lack of or poor implementation of incident management, incident managers should be familiar with the use of incident management teams or incident command team as described in NFPA 1561.

**SUBSTANTIATION:** The committee is adding annex material to emphasize the need to use incident management teams or incident command teams to reduce fire fighter injuries and deaths attributable to lack of or poor implementation of incident management at incidents.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-48 Log #CP36 **Final Action:** Accept  
(A.8.5.4)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Add a new annex to 8.5.4 (numbered as A.8.8.4 in the draft) to read as follows:

The difficulty in rescuing a downed member or member in trouble cannot be overstated. While one crew/company may suffice at a single family dwelling, the act of rescuing a member who is lost, trapped, or missing will become increasingly difficult at a large commercial building or high rise building.

The ability to rapidly deploy a rapid intervention crew/company from the Command Post to an area remote from the location of the command post can adversely affect the successful rescue of a member. Consideration should be given to assigning a rapid intervention crew/company to each point of crew entry at a commercial building.

For example, if the incident commander has established a tactical level management component (TLMC) at the front and rear of a commercial building, consideration should be given to assigning a rapid intervention crew/company to each TLMC. Likewise, at a working fire in a high rise building, consideration should be given to assigning multiple rapid intervention crews/company to vertical positions near the area(s) of operation. At incidents such as the ones described, it may be desirable for the incident commander to establish a rapid intervention crew/company tactical level management component comprised of multiple companies dependent upon the complexity of the incident.

**SUBSTANTIATION:** The annex material addresses the importance of implementing rapid intervention crews (RIC) during incidents involving commercial structure fires, high rise fires, or other incidents that pose a high risk to fire fighters. The new material provides examples that must be considered when operating tactical level management components (TLMC). If the situation warrants, the incident commander may need to establish a rapid intervention crew/company tactical level management component.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS

1500-49 Log #CP38 **Final Action:** Accept  
(A.9.1.6)

**SUBMITTER:** Technical Committee on Fire Service Occupational Safety and Health

**RECOMMENDATION:** Delete the last 3 paragraphs of A.9.1.6.

**SUBSTANTIATION:** Based upon the current language in A.9.1.6, the technical committee is concerned with the accuracy of the material presented in the last three paragraphs without references. The technical committee is researching the issue of diesel exhaust in fire stations and fire department facilities. Once definitive material is developed, a public comment will be submitted to add new or updated language.

**COMMITTEE MEETING ACTION:** Accept

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS,

PREZANT, TUREN, ZAGARIS

1500-50 Log #4 **Final Action:** Reject  
(Entire Document)

**SUBMITTER:** Denyse DuBrucq, AirWars Defense

**RECOMMENDATION:** Add new text as follows:

Liquid Nitrogen applied appropriately generates inert gas, Nitrogen, displacing air, which contains Oxygen, and cools the air, liquids and solids. This stops fires, prevents additional explosions, and gels or solidifies fuel, postpones, often, explosions of IEDs, and asphyxiates suicide bombers and hostage takers and their victims. It also asphyxiates people who are not wearing breathing apparatus in the midst of the Nitrogen atmosphere.

When fire companies equip to use Liquid Nitrogen to fight fires and control other crises, the personnel should be provided with breathing apparatus including full face coverage to protect the eyes, covers that are cryogenic temperature tolerant for rubber boots and other footwear, and Malden Mills fleece mittens that allow holding cryogenic temperature apparatus with the hands. Equipment should have fleece padding where one might grab the device to prevent freezing to the apparatus.

When buildings in the community build in Liquid Nitrogen fixed fire control systems, the fire companies should be equipped to carry to the scene extra Liquid Nitrogen and provide the above personnel equipment. The building will be equipped with breathing apparatus for occupants and instructions for resuscitation if one is caught in the Liquid Nitrogen atmosphere resulting from use of the system.

**SUBSTANTIATION:** The mechanism stopping breathing is lack of CO2 produced in the Oxygenation exchange in the lungs. With low CO2, the breathing stops. This prevents one from breathing in fire destroying the lungs. In toxic attacks as chemical and biological agents, it stops invasion through the nasal passage and lungs. These are all lifesaving IF rescue comes in time with immediate resuscitation once a living being is accessed during crises.

Resuscitation should include elevated CO2 content gas to jump start breathing and an Oxygen rich air supply to sustain breathing and life as the living being is removed from danger. In the case of toxic attack, the breathing apparatus should have a full-face cover with windows or glasses installed so the eyes are not compromised in the recovery process.

Because Liquid Nitrogen cools the environment as well as laying out an atmosphere of pure Nitrogen gas, those overcome with lack of CO2 production have a longer safe time before recovery than were they not breathing at room temperature or fire temperatures. Drowning victims are often resuscitated with no damage when pulled from cold waters when having ceased from breathing for extended periods.

Liquid Nitrogen can end hostage crises by causing people to quickly pass out. Rescuers handcuff criminals and resuscitate all people and animals. The risk of making all unconscious to prevent death of victims is something those working the crisis must make.

LN is recommended for storage of flammables, silos, manufacturing, cleaning or servicing with fire hazards, and buildings where destruction of equipment, papers, customers' property and packaging is unacceptable. Primary water states as Colorado, Utah, Nevada, New Mexico, Arizona, and California preserve water if they substitute Liquid Nitrogen for water in fire fighting.

Those caught in these fires would perish. If downed with Liquid Nitrogen, they may survive if rescuers in breathing apparatus with protection enter the fire, place breathing apparatus on victims found and resuscitate them and then remove them from the damaged area. The fire will be out faster with the Nitrogen atmosphere preventing victims from suffering burns and disfigurement.

**COMMITTEE MEETING ACTION:** Reject

**COMMITTEE STATEMENT:** The submitter has not provided specific language written in mandatory terms nor has the submitter indicated where in the document they want material added. The standard already requires the use of SCBA in IDLH atmospheres.

**NUMBER ELIGIBLE TO VOTE:** 33

**BALLOT RESULTS:** Affirmative: 27

**BALLOT NOT RETURNED:** 6 GABELMANN, GALE, NORRIS, PREZANT, TUREN, ZAGARIS



**NFPA 1500  
Standard on  
Fire Department Occupational Safety and Health Program  
2007 Edition**

NOTICE: An asterisk (\*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, Annex H lists the complete title and edition of the source documents for both mandatory and nonmandatory extracts.

Information on referenced publications can be found in Chapter 2 and Annex H.

### Chapter 1 Administration

**1.1 Scope.** This standard shall contain minimum requirements for a fire service–related occupational safety and health program.

#### 1.2 Purpose.

**1.2.1** The purpose of this standard shall be to specify the minimum requirements for an occupational safety and health program for a fire department.

**1.2.2** This standard shall specify safety requirements for those members involved in rescue, fire suppression, emergency medical services, hazardous materials operations, special operations, and related activities.

**1.2.3\*** The authority having jurisdiction shall identify which performance objectives of this standard existing programs or policies meet.

**1.2.4** Nothing herein shall be intended to restrict any jurisdiction from exceeding these minimum requirements.

#### 1.3 Application.

**1.3.1\*** The requirements of this standard shall be applicable to public, governmental, military, private, and industrial fire department organizations providing rescue, fire suppression, emergency medical services, hazardous materials mitigation, special operations, and other emergency services.

**1.3.2** This standard shall not apply to industrial fire brigades meeting the requirements of NFPA 600, *Standard on Industrial Fire Brigades*.

#### 1.4 Equivalency.

**1.4.1\*** The authority having jurisdiction shall be permitted to approve an equivalent level of qualifications for the requirements specified in Chapter 5 of this standard.

**1.4.2** The fire department shall provide technical documentation to demonstrate equivalency.

#### 1.5 Adoption Requirements.

**1.5.1\*** When this standard is adopted by a jurisdiction, the authority having jurisdiction shall set a date or dates for achieving compliance with the requirements of this standard.

**1.5.2** The authority having jurisdiction shall be permitted to establish a phase-in schedule for compliance with specific requirements of this standard.

**1.5.3** The fire department shall adopt a risk management plan as specified in Section 4.2 of this standard.

**1.5.3.1** This risk management plan shall include a written plan for compliance with this standard.

### Chapter 2 Referenced Publications

**2.1 General.** The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

**2.2 NFPA Publications.** National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 10, *Standard for Portable Fire Extinguishers*, 2002 edition.

NFPA 101<sup>®</sup>, *Life Safety Code*<sup>®</sup>, 2006 edition.

NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents*, 2002 edition.

NFPA 473, *Standard for Competencies for EMS Personnel Responding to Hazardous Materials Incidents*, 2002 edition.

NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, 2002 edition.

NFPA 1002, *Standard on Fire Apparatus Driver/Operator Professional Qualifications*, 2003 edition.

NFPA 1003, *Standard for Airport Fire Fighter Professional Qualifications*, 2005 edition.

NFPA 1006, *Standard for Rescue Technician Professional Qualifications*, 2003 edition.

NFPA 1021, *Standard for Fire Officer Professional Qualifications*, 2003 edition.

NFPA 1051, *Standard for Wildland Fire Fighter Professional Qualifications*, 2002 edition.

NFPA 1071, *Standard for Emergency Vehicle Technician Professional Qualifications*, 2000 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 2002 edition.

NFPA 1403, *Standard on Live Fire Training Evolutions*, 2002 edition.

NFPA 1404, *Standard for Fire Service Respiratory Protection Training*, 2002 edition.

NFPA 1521, *Standard for Fire Department Safety Officer*, 2002 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System*, 2005 edition.

NFPA 1581, *Standard on Fire Department Infection Control Program*, 2005 edition.

NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*, 2003 edition.

NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Fighters*, 2000 edition.

NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents*, 2004 edition.

NFPA 1851, *Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles*, 2001 edition.

NFPA 1852, *Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)*, 2002 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2003 edition.

NFPA 1906, *Standard for Wildland Fire Apparatus*, 2001 edition.

NFPA 1911, *Standard for Service Tests of Fire Pump Systems on Fire Apparatus*, 2002 edition.

NFPA 1912, *Standard for Fire Apparatus Refurbishing*, 2001 edition.

NFPA 1914, *Standard for Testing Fire Department Aerial Devices*, 2002 edition.

NFPA 1915, *Standard for Fire Apparatus Preventive Maintenance Program*, 2000 edition.

NFPA 1925, *Standard on Marine Fire-Fighting Vessels*, 2004 edition.

NFPA 1931, *Standard for Manufacturer's Design of Fire Department Ground Ladders*, 2004 edition.

NFPA 1932, *Standard on Use, Maintenance, and Service Testing of In-Service Fire Department Ground Ladders*, 2004 edition.

NFPA 1936, *Standard on Powered Rescue Tool Systems*, 2005 edition.

NFPA 1951, *Standard on Protective Ensemble for USAR Operations*, 2001 edition.

NFPA 1961, *Standard on Fire Hose*, 2002 edition.

NFPA 1962, *Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose*, 2003 edition.

NFPA 1964, *Standard for Spray Nozzles*, 2003 edition.

NFPA 1971, *Standard on Protective Ensemble for Structural Fire Fighting*, 2000 edition.

NFPA 1975, *Standard on Station/Work Uniforms for Fire and Emergency Services*, 2004 edition.

NFPA 1976, *Standard on Protective Ensemble for Proximity Fire Fighting*, 2000 edition.

NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting*, 1998 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*, 2002 edition.

NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*, 1998 edition.

NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components*, 2001 edition.

NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*, 2003 edition.

NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies*, 2000 edition.

NFPA 1992, *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies*, 2000 edition.

NFPA 1994, *Standard on Protective Ensembles for Chemical/Biological Terrorism Incidents*, 2001 edition.

NFPA 1999, *Standard on Protective Clothing for Emergency Medical Operations*, 2003 edition.

### 2.3 Other Publications.

**2.3.1 ACGIH Publication.** American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Cincinnati, OH 45240-1634.

*TLVs® and BEIs®, 2005.*

**2.3.2 ANSI Publication.** American National Standards Institute, Inc., 11 West 42nd Street, 13th floor, New York, NY 10036.

ANSI Z87.1, *Practice for Occupational and Educational Eye and Face Protection*, 2003.

**2.3.3 U.S. Coast Guard Publication.** U.S. Coast Guard Commandant Instruction M 16465, Department of Transportation, Washington, DC 20241.

U.S. Coast Guard *Chemical Hazard Response Information System (CHRIS)*.

**2.3.4 U.S. Government Publications.** U.S. Government Printing Office, Washington, DC 20402.

NIOSH *Pocket Guide to Chemical Hazards*, U.S. Department of Health and Human Services, Center for Disease Control and Prevention. NIOSH Publication 97-140, February 2004.

NIOSH *Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air Purifying Respirator (APR)*, March 2003.

NIOSH *Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Open Circuit Self-Contained Breathing Apparatus (SCBA)*, December 2001.

Title 29, *Code of Federal Regulations*, Part 1910.1030, Bloodborne pathogens, January 2001.

Title 42, *Code of Federal Regulations*, Part 84, Approval of Respiratory Protective Devices, June 1995.

### 2.3.5 Other Publication.

Lewis, Richard J., Sr., *Sax's Dangerous Properties of Industrial Materials*, 11th ed., John Wiley & Sons, 2004.

## Chapter 3 Definitions

**3.1 General.** The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

### 3.2 Official NFPA Definitions.

**3.2.1\* Approved.** Acceptable to the authority having jurisdiction.

**3.2.2\* Authority Having Jurisdiction (AHJ).** The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure.

**3.2.3 Shall.** Indicates a mandatory requirement.

**3.2.4 Should.** Indicates a recommendation or that which is advised but not required.

### 3.3 General Definitions.

**3.3.1 Advanced Life Support (ALS).** Emergency medical treatment beyond basic life support level as defined by the medical authority having jurisdiction.

**3.3.2 Aerial Device.** An aerial ladder, elevating platform, or water tower that is designed to position personnel, handle materials, provide continuous egress, or discharge water. [1901, 2003]

**3.3.3\* Aircraft Rescue and Fire Fighting.** The fire-fighting actions taken to rescue persons and to control or extinguish fire involving or adjacent to aircraft on the ground.

**3.3.4\* Air Transfer.** The process of transferring air from one SCBA cylinder to another SCBA cylinder of the same rated pressure capacity by connecting them together with properly designed fittings and a high-pressure transfer line.

### 3.3.5 Atmosphere.

**3.3.5.1\* Hazardous Atmosphere.** Any atmosphere that is oxygen deficient or that contains a toxic or disease-producing contaminant. [1404, 2002]

**3.3.5.2 Oxygen-Deficient Atmosphere.** Air atmospheres containing less than 19.5 percent oxygen by volume at one standard atmosphere pressure.

**3.3.6 Basic Life Support (BLS).** Emergency medical treatment at a level as defined by the medical authority having jurisdiction.

**3.3.7 Biological Terrorism Agents.** Biological materials that are capable of causing an acute disease or long-term damage to the human body. [1999, 2003]

**3.3.8\* Candidate.** A person who has submitted an application to become a member of the fire department.

**3.3.9 Chemical Terrorism Agents.** Liquid, solid, gaseous, and vapor chemical agents, and dual use industrial chemicals used to inflict lethal or incapacitating casualties.

**3.3.10\* Clear Text.** The use of plain language in radio communications transmissions.

**3.3.11 Closed-Circuit SCBA.** *See 3.3.75.1.*

**3.3.12 Communicable Disease.** *See 3.3.20.1.*

**3.3.13\* Company.** A group of members (1) under the direct supervision of an officer; (2) trained and equipped to perform assigned tasks; (3) usually organized and identified as engine companies, ladder companies, rescue companies, squad companies, or multi-functional companies; (4) operating with one piece of fire apparatus (pumper, aerial fire apparatus, elevating platform, quint, rescue, squad, ambulance) except where multiple apparatus are assigned that are dispatched and arrive together, continuously operate together, and are managed by a single company officer; (5) arriving at the incident scene on fire apparatus.

**3.3.14\* Confined Space.** An area large enough and so configured that a member can bodily enter and perform assigned work but which has limited or restricted means for entry and exit and is not designed for continuous human occupancy.

**3.3.15 Contaminant.** A harmful, irritating, or nuisance material foreign to the normal atmosphere. [1404, 2002]

**3.3.16 Control Zones.** The areas at an incident that are designated based upon safety and the degree of hazard.

**3.3.16.1 Cold Zone.** The control zone of an incident that contains the command post and such other support functions as are deemed necessary to control the incident.

**3.3.16.2 Hot Zone.** The control zone immediately surrounding a hazardous area, which extends far enough to prevent adverse effects to personnel outside the zone.

**3.3.16.3 Warm Zone.** The control zone outside the hot zone where personnel and equipment decontamination and hot zone support takes place.

**3.3.17 Crew.** A team of two or more fire fighters.

**3.3.18 Debilitating Illness or Injury.** A condition that temporarily or permanently prevents a member of the fire department from engaging in normal duties and activities as a result of illness or injury.

**3.3.19 Defensive Operations.** *See 3.3.59.1.*

### 3.3.20 Disease.

**3.3.20.1\* Communicable Disease.** A disease that can be transmitted from one person to another.

**3.3.20.2 Infectious Disease.** An illness or disease resulting from invasion of a host by disease-producing organisms such as bacteria, viruses, fungi, or parasites.

**3.3.21 Drug.** Any substance, chemical, over-the-counter medication, or prescribed medication that can affect the performance of the fire fighter.

**3.3.22 Emergency Incident.** See 3.3.43.1

**3.3.23 Emergency Medical Services.** The provision of treatment, such as first aid, cardiopulmonary resuscitation, basic life support, advanced life support, and other pre-hospital procedures including ambulance transportation, to patients.

**3.3.24 Emergency Operations.** See 3.3.59.2.

**3.3.25 Facility.** See 3.3.29, *Fire Department Facility*.

**3.3.26 Fire Apparatus.** A vehicle designed to be used under emergency conditions to transport personnel and equipment, and to support the suppression of fires and mitigation of other hazardous situations. [1901, 2003]

**3.3.27 Fire Chief.** The highest ranking officer in charge of a fire department. [1710, 2004]

**3.3.28\* Fire Department.** An organization that provides fire suppression and other services.

**3.3.28.1\* Industrial Fire Department.** An organization providing rescue, fire suppression, and related activities as well as emergency medical services, hazardous material operations, or other activities that occur at a single facility or facilities under the same management.

**3.3.29\* Fire Department Facility.** Any building or area owned, operated, occupied, or used by a fire department on a routine basis.

**3.3.30 Fire Department Member.** See 3.3.53, *Member*.

**3.3.31 Fire Fighting.**

**3.3.31.1\* Proximity Fire Fighting.** Specialized fire-fighting operations that can include the activities of rescue, fire suppression, and property conservation at incidents involving fires producing very high levels of conductive, convective, and radiant heat such as aircraft fires, bulk flammable gas fires, and bulk flammable liquid fires.

**3.3.31.2 Structural Fire Fighting.** The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, aircraft interiors, vehicles, vessels, aircraft, or like properties that are involved in a fire or emergency situation. [1710, 2004]

**3.3.31.3 Wildland Fire Fighting.** The activities of fire suppression and property conservation in woodlands, forests, grasslands, brush, prairies, and other such vegetation, or any combination of vegetation, that is involved in a fire situation but is not within buildings or structures. [1977, 1998]

**3.3.32 Fire Shelter.** An item of protective equipment configured as an aluminized tent utilized for protection, by means of reflecting radiant heat, in a fire entrapment situation.

**3.3.33\* Fire Suppression.** The activities involved in controlling and extinguishing fires.

**3.3.34\* Hazard.** A condition that presents the potential for harm or damage to people, property, or the environment.

**3.3.35 Hazardous Area.** The area where members might be exposed to a hazard or hazardous atmosphere. A particular substance, device, event, circumstance, or condition that presents a danger to members of the fire department.

**3.3.36 Hazardous Atmosphere.** See 3.3.5.1.

**3.3.37 Hazardous Material.** A substance (solid, liquid, or gas) that when released is capable of creating harm to people, the environment, and property. [472, 2002]

**3.3.38 Hazardous Materials Operations.** See 3.3.59.3.

**3.3.39 Health and Fitness Coordinator.** The person who, under the supervision of the fire department physician, has been designated by the department to coordinate and be responsible for the health and fitness programs of the department.

**3.3.40\* Health and Safety Officer.** The member of the fire department assigned and authorized by the fire chief as the manager of the safety and health program.

**3.3.41 Health Data Base.** A compilation of records and data that relates to the health experience of a group of individuals and is maintained in a manner such that it is retrievable for study and analysis over a period of time.

**3.3.42 Immediately Dangerous to Life or Health (IDLH).** Any condition that would pose an immediate or delayed threat to life, cause irreversible adverse health effects, or interfere with an individual's ability to escape unaided from a hazardous environment. [1670, 2004]

**3.3.43 Incident.**

**3.3.43.1 Emergency Incident.** Any situation to which the emergency services organization responds to deliver emergency services, including rescue, fire suppression, emergency medical care, special operations, law enforcement, and other forms of hazard control and mitigation. [1561, 2005]

**3.3.43.2 Rescue Incident.** An emergency incident that primarily involves the rescue of persons subject to physical danger and that can include the provision of emergency medical services.

**3.3.44 Incident Action Plan.** The objectives reflecting the overall incident strategy, tactics, risk management, and member safety that are developed by the incident commander. Incident action plans are updated throughout the incident.

**3.3.45 Incident Commander (IC).** The person who is responsible for all decisions relating to the management of the incident and is in charge of the incident site. [472, 2002]

**3.3.46\* Incident Management System (IMS).** A system that defines the roles and responsibilities to be assumed by responders and the standard operating procedures to be used in the management and direction of emergency incidents and other functions.

**3.3.47 Incident Safety Officer.** An individual appointed to respond or assigned at an incident scene by the incident commander to perform the duties and responsibilities of that position as part of the command staff.

**3.3.48 Industrial Fire Department.** See 3.3.28.1

**3.3.49 Infection Control Program.** The fire department's formal policy and implementation of procedures relating to the control of infectious and communicable disease hazards where employees, patients, or the general public could be exposed to blood, body fluids, or other potentially infectious materials in the fire department work environment.

**3.3.50 Infectious Disease.** See 3.3.20.2.

**3.3.51 Life Safety Rope.** Rope dedicated solely for the purpose of supporting people during rescue, fire-fighting, other emergency operations, or during training evolutions.

**3.3.52 Life Support.** See 3.3.1, *Advanced Life Support (ALS)* and 3.3.6, *Basic Life Support (BLS)*.

**3.3.53\* Member.** A person involved in performing the duties and responsibilities of a fire department, under the auspices of the organization.

**3.3.54 Member Assistance Program (MAP).** A generic term used to describe the various methods used in the fire department for the control of alcohol and other substance abuse, stress, and personal problems that adversely affect member performance.

**3.3.55 Member Organization.** An organization formed to represent the collective and individual rights and interests of the members of the fire department, such as a labor union or fire fighters' association.

**3.3.56 Occupational Illness.** An illness or disease contracted through or aggravated by the performance of the duties, responsibilities, and functions of a fire department member.

**3.3.57 Occupational Injury.** An injury sustained during the performance of the duties, responsibilities, and functions of a fire department member.

**3.3.58 Offensive Operations.** See 3.3.59.4.

**3.3.59 Operations.**

**3.3.59.1\* Defensive Operations.** Actions that are intended to control a fire by limiting its spread to a defined area, avoiding the commitment of personnel and equipment to dangerous areas.

**3.3.59.2 Emergency Operations.** Activities of the fire department relating to rescue, fire suppression, emergency medical care, and special operations, including response to the scene of the incident and all functions performed at the scene.

**3.3.59.3 Hazardous Materials Operations.** All activities performed at the scene of a hazardous materials incident that expose fire department members to the dangers of hazardous materials.

**3.3.59.4 Offensive Operations.** Actions generally performed in the interior of involved structures that involve a direct attack on a fire to directly control and extinguish the fire.

**3.3.59.5\* Special Operations.** Those emergency incidents to which the fire department responds that require specific and advanced training and specialized tools and equipment.

**3.3.60 Oxygen-Deficient Atmosphere.** *See 3.3.5.2.*

**3.3.61 Personnel Accountability System.** A system that readily identifies both the location and function of all members operating at an incident scene.

**3.3.62 Procedure.** An organizational directive issued by the authority having jurisdiction or by the department that establishes a specific policy that must be followed. [1561, 2005]

**3.3.63\* Protective Ensemble.** Multiple elements of clothing and equipment designed to provide a degree of protection for fire fighters from adverse exposures to the inherent risks of fire-fighting operations and certain other emergency operations.

**3.3.64 Proximity Fire Fighting.** *See 3.3.31.1.*

**3.3.65 Qualified Person.** A person who, by possession of a recognized degree, certificate, professional standing, or skill, and who, by knowledge, training, and experience, has demonstrated the ability to deal with problems related to a particular subject matter, work, or project. [1451, 2002]

**3.3.66\* Rapid Intervention Crew/Company (RIC).** A minimum of two fully equipped members who are on-site and assigned specifically to initiate the immediate rescue of injured or trapped members.

**3.3.67 Related Activities.** Any and all functions that fire department members can be called upon to perform in the execution of their duties.

**3.3.68 Rescue.** Those activities directed at locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health care facility. *See also 3.3.80, Technical Rescue.*

**3.3.69 Rescue Incident.** *See 3.3.43.2.*

**3.3.70\* Respiratory Protection Equipment (RPE).** Devices that are designed to protect the respiratory system against exposure to gases, vapors, or particulates. [1404, 2002]

**3.3.71 Risk.** A measure of the probability and severity of adverse effects that result from an exposure to a hazard. [1451, 2002]

**3.3.72 Risk Management.** The process of planning, organizing, directing, and controlling the resources and activities of an organization in order to minimize detrimental effects on that organization. [1250, 2004]

**3.3.73 SCBA.** Acronym for Self-Contained Breathing Apparatus. [1982, 1998]

**3.3.74 Seat Belt.** A two-point lap belt, a three-point lap/shoulder belt, or a four-point lap/shoulder harness for vehicle occupants designed to limit their movement in the event of an accident, rapid acceleration, or rapid deceleration by securing individuals safely to a vehicle in a seated position. (*See also 3.3.81, Vehicle Safety Harness.*)

**3.3.75 Self-Contained Breathing Apparatus (SCBA).** A respirator worn by the user that supplies a respirable atmosphere that is either carried in or generated by the apparatus and is independent of the ambient environment.

**3.3.75.1 Closed-Circuit SCBA.** A recirculation-type SCBA in which the exhaled gas is re-breathed by the wearer after the carbon dioxide has been removed from the exhalation gas and the oxygen content within the system has been restored from sources such as compressed breathing air, chemical oxygen, and liquid oxygen, or compressed gaseous oxygen. [1981, 2002]

**3.3.76 Service Test.** The regular, periodic inspection and testing of apparatus and equipment, according to an established schedule and guideline, to ensure that they are in safe and functional operating condition.

**3.3.77 Special Operations.** *See 3.3.59.5.*

**3.3.78 Structural Fire Fighting.** *See 3.3.31.2.*

**3.3.79 Tactical Level Management Component (TLMC).** A management unit identified in the incident management system commonly known as "division," "group," or "sector." [1561, 2005]

**3.3.80 Technical Rescue.** The application of special knowledge, skills, and equipment to safely resolve unique and/or complex rescue situations. [1670, 2004]

**3.3.81 Vehicle Safety Harness.** A restraint device for vehicle occupants designed to limit their movement in the event of an accident, rapid acceleration, or rapid deceleration by securing individuals safely to a vehicle either in a seated position or tethered to the vehicle. (*See also 3.3.74, Seat Belt.*)

**3.3.82 Wildland Fire Fighting.** *See 3.3.31.3.*

## Chapter 4 Fire Department Administration

### 4.1 Fire Department Organizational Statement.

**4.1.1\*** The fire department shall prepare and maintain a written statement or policy that establishes the existence of the fire department, the services the fire department is authorized and expected to perform, and the basic organizational structure.

**4.1.2\*** The fire department shall prepare and maintain written policies and standard operating procedures that document the organization structure, membership, roles and responsibilities, expected functions, and training requirements, including the following:

(1) The types of standard evolutions that are expected to be performed and the evolutions that must be performed simultaneously or in sequence for different types of situations

(2) The minimum number of members who are required to perform each function or evolution and the manner in which the function is to be performed

(3) The number and types of apparatus and the number of personnel that will be dispatched to different types of incidents

(4) The procedures that will be employed to initiate and manage operations at the scene of an emergency incident

**4.1.3** The organizational statement and procedures shall be available for inspection by members or their designated representative.

### 4.2 Risk Management Plan.

**4.2.1\*** The fire department shall develop and adopt a comprehensive written risk management plan.

**4.2.2** The risk management plan shall at least cover the risks associated with the following:

(1) Administration

(2) Facilities

(3) Training

(4) Vehicle operations, both emergency and non-emergency

(5) Protective clothing and equipment

(6) Operations at emergency incidents (*see Annex C*)

(7) Operations at non-emergency incidents

(8) Other related activities

**4.2.3\*** The risk management plan shall include at least the following components (*see Annex D*):

(1) Risk identification — actual and potential hazards

(2) Risk evaluation — likelihood of occurrence of a given hazard and severity of its consequences

(3) Establishment of priorities for action — the degree of a hazard based upon the frequency and risk of occurrence

(4) Risk control techniques — solutions for elimination or mitigation of potential hazards; implementation of best solution

(5) Risk management monitoring — evaluation of effectiveness of risk control techniques

### 4.3 Safety and Health Policy.

**4.3.1\*** The fire department shall adopt an official written departmental occupational safety and health policy that identifies specific goals and objectives for the prevention and elimination of accidents and occupational injuries, exposures to communicable disease, illnesses, and fatalities.

**4.3.2** It shall be the policy of the fire department to seek and to provide an occupational safety and health program that complies with this standard for its members.

**4.3.3\*** The fire department shall evaluate the effectiveness of the occupational safety and health program at least once every 3 years.

**4.3.3.1** An audit report of the findings shall be submitted to the fire chief and to the members of the occupational safety and health committee.

### 4.4 Roles and Responsibilities.

**4.4.1** It shall be the responsibility of the fire department to research, develop, implement, and enforce an occupational safety and health program that recognizes and reduces the inherent risks involved in the operations of a fire

department.

**4.4.2** The fire department shall be responsible for compliance with all applicable laws and legal requirements with respect to member safety and health.

**4.4.3\*** The fire department shall establish and enforce rules, regulations, and standard operating procedures to meet the objectives of this standard.

**4.4.4** The fire department shall be responsible for developing and implementing an accident investigation procedure.

**4.4.5\*** All accidents, near misses, injuries, fatalities, illnesses, and exposures involving members shall be investigated.

**4.4.6** All accidents involving fire department vehicles, equipment, or fire department facilities shall be investigated.

**4.4.7** The fire department shall take whatever appropriate corrective action necessary to avoid repetitive occurrences of accidents and exposure to communicable diseases.

**4.4.8** Records of such investigations shall be kept in accordance with the applicable provisions of 4.6.1.

**4.4.9** Each individual member of the fire department shall cooperate, participate, and comply with the provisions of the occupational safety and health program.

**4.4.10** It shall be the right of each member to be protected by an effective occupational safety and health program and to participate or be represented in the research, development, implementation, evaluation, and enforcement of the program.

**4.4.11** The member organization, where such an organization exists, shall cooperate with the fire department by representing the interests and the welfare of the members in the research, development, implementation, and evaluation of the occupational safety and health program.

**4.4.12** The member organization shall have the right to represent the individual and collective rights of its members in the occupational safety and health program.

#### **4.5 Occupational Safety and Health Committee.**

**4.5.1\*** An occupational safety and health committee shall be established and shall serve in an advisory capacity to the fire chief.

**4.5.1.1** The committee shall include the following members:

- (1) The designated fire department health and safety officer
- (2) Representatives of fire department management
- (3) Individual members or representatives of member organizations

**4.5.1.2** The committee shall also be permitted to include other persons.

**4.5.1.3** Representatives of member organizations shall be selected by their respective organizations, but other committee members shall be appointed to the committee by the fire chief.

**4.5.2** The purpose of this committee shall be to conduct research, develop recommendations, and study and review matters pertaining to occupational safety and health within the fire department.

**4.5.3\*** The committee shall hold regularly scheduled meetings and shall be permitted to hold special meetings whenever necessary.

**4.5.3.1** Regular meetings shall be held at least once every 6 months.

**4.5.3.2** Written minutes of each meeting shall be retained and shall be made available to all members.

#### **4.6 Records.**

**4.6.1\*** The fire department shall establish a data collection system and maintain permanent records of all accidents, injuries, illnesses, exposures to infectious agents and communicable diseases, or deaths that are job related.

**4.6.2** The data collection system shall also maintain individual records of any occupational exposure to known or suspected toxic products or infectious or communicable diseases.

**4.6.3** The fire department shall assure that a confidential health record for each member and a health data base are maintained.

**4.6.4\*** The fire department shall maintain training records for each member indicating dates, subjects covered, satisfactory completion, and, if any, certifications achieved.

**4.6.5** The fire department shall assure that inspection, maintenance, repair, and service records are maintained for all vehicles and equipment used for

emergency operations and training.

#### **4.7 Appointment of the Health and Safety Officer.**

**4.7.1** The fire chief shall appoint a designated fire department health and safety officer.

**4.7.2** The health and safety officer shall meet the qualification defined in NFPA 1521, *Standard for Fire Department Safety Officer*.

**4.7.3** The fire chief shall ensure the fire department health and safety officer is given the authority to administer the health and safety program.

**4.7.4** The health and safety officer shall perform the functions defined in NFPA 1521.

**4.7.5** The fire department health and safety officer shall be responsible for the management of the occupational safety and health program.

**4.7.6** The fire chief shall make available such additional safety officers and resources as required to fulfill the requirements of the occupational safety and health program to meet the requirements of NFPA 1521.

### **Chapter 5 Training, Education, and Professional Development**

#### **5.1 General Requirements.**

**5.1.1\*** The fire department shall establish and maintain a training, education, and professional development program with a goal of preventing occupational deaths, injuries, and illnesses.

**5.1.2** The fire department shall provide training, education, and professional development for all department members commensurate with the duties and functions that they are expected to perform.

**5.1.3** The fire department shall establish training and education programs that provide new members initial training, proficiency opportunities, and a method of skill and knowledge evaluation for duties assigned to the member prior to engaging in emergency operations.

**5.1.4\*** The fire department shall restrict the activities of new members during emergency operations until the member has demonstrated the skills and abilities to complete the tasks expected.

**5.1.5** The fire department shall provide all members with training and education on the department's risk management plan.

**5.1.6** The fire department shall provide all members with training and education on the department's written procedures.

**5.1.7** The fire department shall provide all members with a training, education, and professional development program commensurate with the emergency medical services that are provided by the department.

**5.1.8** The fire department shall provide all members with a training and education program that covers the operation, limitation, maintenance, and retirement criteria for all assigned personal protective equipment expected to be utilized by members.

**5.1.9** As a duty function, members shall be responsible to maintain proficiency in skills, knowledge, and professional development provided to the member through department training and education programs.

**5.1.10** Training programs for all members engaged in emergency operations shall include procedures for the safe exit and accountability of members during rapid evacuation, equipment failure, or other dangerous situations and events.

**5.1.11** All members who are likely to be involved in emergency operations shall be trained in the incident management and accountability system used by the fire department.

#### **5.2 Member Qualifications.**

**5.2.1** All members who engage in structural fire fighting shall meet the requirements of NFPA 1001, *Standard for Fire Fighter Professional Qualifications*.

**5.2.2\*** All driver/operators shall meet the requirements of NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*.

**5.2.3** All aircraft rescue fire fighters (ARFF) shall meet the requirements of NFPA 1003, *Standard for Airport Fire Fighter Professional Qualifications*.

**5.2.4** All fire officers shall meet the requirements of NFPA 1021, *Standard for Fire Officer Professional Qualifications*.

**5.2.5** All wildland fire fighters shall meet the requirements of NFPA 1051, *Standard for Wildland Fire Fighter Professional Qualifications*. (See Annex E.)

**5.2.6\*** All members responding to hazardous materials incidents shall meet the operations level as required in NFPA 472.

### 5.3 Training Requirements.

**5.3.1\*** The fire department shall adopt or develop training and education curriculums that meet the minimum requirements outlined in professional qualification standards covering a member's assigned function.

**5.3.2** The fire department shall provide training, education, and professional development programs as required to support the minimum qualifications and certifications expected of its members.

**5.3.3** Members shall practice assigned skill sets on a regular basis but not less than annually.

**5.3.4** The fire department shall provide specific training to members when written policies, practices, procedures, or guidelines are changed and/or updated.

**5.3.5\*** The respiratory protection training program shall meet the requirements of NFPA 1404, *Standard for Fire Service Respiratory Protection Training*.

**5.3.6** Members who perform wildland fire fighting shall be trained at least annually in the proper deployment of an approved fire shelter.

**5.3.7\*** All live fire training and exercises shall be conducted in accordance with NFPA 1403, *Standard on Live Fire Training Evolutions*.

**5.3.8\*** All training and exercises shall be conducted under the direct supervision of a qualified instructor.

**5.3.9\*** All members who are likely to be involved in emergency medical services shall meet the training requirements of the authority having jurisdiction.

**5.3.10\*** Members shall be fully trained in the care, use, inspection, maintenance, and limitations of the protective clothing and protective equipment assigned to them or available for their use.

**5.3.11** All members shall meet the training requirements as outlined in NFPA 1561, *Standard on Emergency Services Incident Management System*.

**5.3.12** All members shall meet the training requirements as outlined in NFPA 1581, *Standard on Fire Department Infection Control Program*.

### 5.4 Special Operations Training.

**5.4.1** The fire department shall provide specific and advanced training to members who engage in special operations as a technician.

**5.4.2** The fire department shall provide specific training to members who are likely to respond to special operations incidents in a support role to special operations technicians.

**5.4.3** Members expected to perform hazardous materials mitigation activities shall meet the training requirements of a technician as outlined in NFPA 472.

**5.4.4** Members expected to perform technical operations at the technician level as defined in NFPA 1670, *Standard on Operations and Training for Technical Rescue Incidents*, shall meet the training requirements specified in NFPA 1006, *Standard for Rescue Technician Professional Qualifications*.

### 5.5 Member Proficiency.

**5.5.1** The fire department shall develop a recurring proficiency cycle with the goal of preventing skill degradation and potential for injury and death of members.

**5.5.2** The fire department shall develop and maintain a system to monitor and measure training progress and activities of its members.

**5.5.3\*** The fire department shall provide an annual skills check to verify minimum professional qualifications of its members.

## Chapter 6 Fire Apparatus, Equipment, and Driver/Operators

### 6.1 Fire Department Apparatus.

**6.1.1** The fire department shall consider safety and health as primary concerns in the specification, design, construction, acquisition, operation, maintenance, inspection, and repair of all fire department apparatus.

**6.1.1.1\*** The fire department shall specify restraint devices for fire apparatus, including those restraint devices for emergency medical service (EMS) members operating in the patient compartment of the ambulance.

**6.1.2** All new fire apparatus shall be specified and ordered to meet the applicable requirements of NFPA 1901, *Standard for Automotive Fire Apparatus*.

**6.1.3** All new wildland fire apparatus shall be specified and ordered to meet the requirements of NFPA 1906, *Standard for Wildland Fire Apparatus*.

**6.1.4** All fire marine fire-fighting vessels shall be specified and ordered to meet the requirements of NFPA 1925, *Standard on Marine Fire-Fighting Vessels*.

**6.1.5\*** Where tools, equipment, or respiratory protection are carried within enclosed seating areas of fire apparatus or the patient compartment of an ambulance, such items shall be secured by either a positive mechanical means of holding the item in its stowed position or in a compartment with a positive latching door.

**6.1.6** When fire apparatus is refurbished, it shall be specified and ordered to meet the applicable requirements of NFPA 1912, *Standard for Fire Apparatus Refurbishing*.

**6.1.7** Fire departments that operate their own fixed wing or rotary aircraft for fire department operations shall provide four-point restraints for all pilots and passengers, not including any EMS patients.

**6.1.8** Members performing hoist rescue in the passenger area of the aircraft shall be secured by a vehicle safety harness or seat belt system.

### 6.2 Drivers/Operators of Fire Department Apparatus.

**6.2.1\*** Fire apparatus shall be operated only by members who have successfully completed an approved driver training program commensurate with the type of apparatus the member will operate or by trainee drivers who are under the supervision of a qualified driver.

**6.2.2\*** Drivers of fire apparatus shall have valid driver's licenses.

**6.2.2.1** Vehicles shall be operated in compliance with all traffic laws, including sections pertaining to emergency vehicles, and any requirements of the authority having jurisdiction.

**6.2.3** The fire department shall enact specific rules and regulations pertaining to the use of private vehicles for emergency response.

**6.2.3.1** These rules and regulations shall be at least equal to the provisions regulating the operation of fire department vehicles.

**6.2.3.2\*** These rules and regulations shall also apply to the use of emergency lighting equipment, audible warning devices, or both on private vehicles.

**6.2.3.2.1** The rules and regulations shall specify the procedures for use of emergency lighting equipment and audible warning devices and shall be in compliance with the motor vehicle laws of the jurisdiction.

**6.2.3.2.2** Emergency lighting equipment and audible warning devices shall not be installed without the fire department's approval.

**6.2.4\*** Drivers of fire apparatus shall be directly responsible for the safe and prudent operation of the vehicles under all conditions.

**6.2.4.1** When the driver is under the direct supervision of an officer, that officer shall also assume responsibility for the driver's actions.

**6.2.5** Drivers shall not move fire apparatus until all persons on the vehicle are seated and secured with seat belts in approved riding positions, other than as specifically allowed in this chapter.

**6.2.6** Drivers of fire apparatus shall obey all traffic control signals and signs and all laws and rules of the road of the jurisdiction for the operation of motor vehicles.

**6.2.7\*** The fire department shall develop standard operating procedures for safely driving fire apparatus during non-emergency travel and emergency response and shall include specific criteria for vehicle speed, crossing intersections, traversing railroad grade crossings, the use of emergency warning devices, and the backing of fire apparatus.

**6.2.7.1\*** Procedures for all responses shall emphasize that the safe arrival of fire apparatus to the incident scene is the first priority.

**6.2.8\*** During emergency response, drivers of fire apparatus shall bring the vehicle to a complete stop under any of the following circumstances:

- (1) When directed by a law enforcement officer
- (2) Red traffic lights
- (3) Stop signs
- (4) Negative right-of-way intersections
- (5) Blind intersections
- (6) When the driver cannot account for all lanes of traffic in an intersection
- (7) When other intersection hazards are present

(8) When encountering a stopped school bus with flashing warning lights

**6.2.9** Drivers shall proceed through intersections only when the driver can account for all lanes of traffic in the intersection.

**6.2.10\*** During emergency response or non-emergency travel, drivers of fire apparatus shall come to a complete stop at all unguarded railroad grade crossings and ensure that it is safe to proceed before crossing the railroad track(s).

**6.2.11** Drivers shall use caution when approaching and crossing any guarded railroad grade crossing.

**6.2.12** The fire department shall include information on the potential hazards of retarders, such as engine, transmission, and driveline retarders, in the driver training program and shall develop written procedures pertaining to the use of such retarders.

**6.2.13** The fire department shall develop written procedures requiring drivers to discontinue the use of manual brake limiting valves, frequently labeled as a “wet road/dry road” switch, and requiring that the valve/switch remains in the “dry road” position.

### **6.3 Riding in Fire Apparatus.**

**6.3.1\*** All persons riding in fire apparatus shall be seated and belted securely by seat belts in approved riding positions at any time the vehicle is in motion other than as allowed in 6.3.4 and 6.3.5. Standing or riding on tail steps, sidesteps, running boards, or in any other exposed position shall be specifically prohibited.

**6.3.2** Seat belts shall not be released or loosened for any purpose while the vehicle is in motion, including the donning of respiratory protection equipment or protective clothing.

**6.3.3\*** Members actively performing necessary emergency medical care while the vehicle is in motion shall be secured to the vehicle by a seat belt, or by a vehicle safety harness designed for occupant restraint, to the extent consistent with the effective provision of such emergency medical care.

**6.3.3.1** All other persons in the vehicle shall be seated and belted in approved riding positions while the vehicle is in motion.

**6.3.4\*** Fire departments permitting hose loading operations while the vehicle is in motion shall develop written standard operating procedures addressing all safety aspects.

**6.3.5\*** Fire departments permitting tiller training, where both the instructor and the trainee are at the tiller position, shall develop written standard operating procedures addressing all safety aspects.

**6.3.6\*** Helmets shall be provided for and used by persons riding in open cab apparatus or open tiller seats.

**6.3.7\*** Eye protection shall be provided for members riding in open cab apparatus or open tiller seats.

**6.3.8\*** On existing fire apparatus where there is an insufficient number of seats available for the number of members assigned to or expected to ride on that piece of apparatus, alternate means of transportation that provide seated and belted positions shall be used.

### **6.4 Inspection, Maintenance, and Repair of Fire Apparatus.**

**6.4.1\*** All fire apparatus shall be inspected at least weekly, within 24 hours after any use or repair, and prior to being placed in service or used for emergency purposes to identify and correct unsafe conditions.

**6.4.2** A preventive maintenance program shall be established, and records shall be maintained as specified in 4.6.5.

**6.4.3** Inspection, maintenance, and repair of fire apparatus shall be conducted in accordance with NFPA 1915, *Standard for Fire Apparatus Preventive Maintenance Program*.

**6.4.4\*** The fire department shall establish a list of major defects to be utilized to evaluate when a vehicle shall be declared unsafe.

**6.4.4.1** Any fire department vehicle found to be unsafe shall be placed out of service until repaired.

**6.4.5** All repairs to fire department apparatus shall be performed by personnel meeting the requirements of NFPA 1071, *Standard for Emergency Vehicle Technician Professional Qualifications*, or personnel trained to meet the requirements identified by the manufacturers in their specifications and procedures for fire department vehicles and protective equipment.

**6.4.6** Fire pumps on apparatus shall be service tested in accordance with the applicable requirements of NFPA 1911, *Standard for Service Tests of Fire Pump Systems on Fire Apparatus*.

**6.4.7** All aerial devices shall be inspected and service tested in accordance with the applicable requirements of NFPA 1914, *Standard for Testing Fire Department Aerial Devices*.

**6.4.8** All fire apparatus shall be cleaned and disinfected in accordance with NFPA 1581.

### **6.5 Tools and Equipment.**

**6.5.1** The fire department shall consider safety and health as primary concerns in the specification, design, construction, acquisition, operation, maintenance, inspection, and repair of all tools and equipment.

**6.5.2** The hearing conservation objectives of this standard shall be taken into account in the acquisition of new power tools and power equipment.

**6.5.3** All new fire department ground ladders shall be specified and ordered to meet the applicable requirements of NFPA 1931, *Standard for Manufacturer's Design of Fire Department Ground Ladders*.

**6.5.4** All new fire hose shall be specified and ordered to meet the applicable requirements of NFPA 1961, *Standard on Fire Hose*.

**6.5.5** All new fire department spray nozzles shall be specified and ordered to meet the applicable requirements of NFPA 1964, *Standard for Spray Nozzles*.

**6.5.6\*** All equipment carried on fire apparatus or designated for training shall be inspected at least weekly and within 24 hours after any use.

**6.5.7** Inventory records shall be maintained for the equipment carried on each vehicle and for equipment designated for training.

**6.5.8** All equipment carried on fire apparatus or designated for training shall be tested at least annually in accordance with manufacturers' instructions and applicable standards.

**6.5.9** Fire-fighting equipment found to be defective or in unserviceable condition shall be removed from service and repaired or replaced.

**6.5.10** All fire department equipment and tools shall be cleaned and disinfected in accordance with NFPA 1581.

**6.5.11** All ground ladders shall be inspected and service tested in accordance with the applicable requirements of NFPA 1932, *Standard on Use, Maintenance, and Service Testing of In-Service Fire Department Ground Ladders*.

**6.5.12** All fire hose shall be inspected and service tested in accordance with the applicable requirements of NFPA 1962, *Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose*.

**6.5.13** All fire extinguishers shall be inspected and tested in accordance with the applicable requirements of NFPA 10, *Standard for Portable Fire Extinguishers*.

**6.5.14** All fire department hydraulic rescue tools shall meet the requirements of NFPA 1936, *Standard on Powered Rescue Tool Systems*.

## **Chapter 7 Protective Clothing and Protective Equipment**

### **7.1 General.**

**7.1.1\*** The fire department shall provide each member with the appropriate protective clothing and protective equipment to provide protection from the hazards to which the member is or is likely to be exposed.

**7.1.1.1** Such protective clothing and protective equipment shall be suitable for the tasks that the member is expected to perform.

**7.1.2\*** Protective clothing and protective equipment shall be used whenever the member is exposed or potentially exposed to the hazards for which it is provided.

**7.1.3\*** Structural fire-fighting protective clothing shall be cleaned at least every 6 months as specified in NFPA 1851, *Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles*.

**7.1.4\*** Cleaning processes for protective clothing ensembles shall be appropriate for the types of contaminants and for the materials that are to be cleaned.

**7.1.5\*** Where station/work uniforms are worn by members, such station/work uniforms shall meet the requirements of NFPA 1975, *Standard on Station/Work Uniforms for Fire and Emergency Services*.

**7.1.6** While on duty, members shall not wear any clothing that is unsafe due to poor thermal stability.

**7.1.7\*** The fire department shall provide for the cleaning of protective clothing and station/work uniforms.

**7.1.7.1** Such cleaning shall be performed either by a cleaning service that is familiar with the proper procedures and equipped to handle contaminated clothing or by a fire department facility that is equipped to handle contaminated clothing.

**7.1.7.2** Where such cleaning is conducted in fire stations, the fire department shall provide at least one washing machine for this purpose in the designated cleaning area specified in NFPA 1581.

## **7.2 Protective Clothing for Structural Fire Fighting.**

**7.2.1\*** Members who engage in or are exposed to the hazards of structural fire fighting shall be provided with and shall use a protective ensemble that shall meet the applicable requirements of NFPA 1971, *Standard on Protective Ensemble for Structural Fire Fighting*.

**7.2.2\*** The protective coat and the protective trousers shall have at least a 2 in. (50 mm) overlap of all layers so there is no gapping of the total thermal protection when the protective garments are worn.

**7.2.2.1** The minimum overlap shall be determined by measuring the garments on the wearer, without SCBA, in both of the following positions:

(1) Position A — standing, hands together reaching overhead as high as possible

(2) Position B — standing, hands together reaching overhead, with body bent forward at a 90-degree angle, to the side (either left or right), and to the back

**7.2.3** Single-piece protective coveralls shall not be required to have an overlap of all layers provided there is continuous composite protection.

### **7.2.4 Gloves.**

**7.2.4.1** Fire departments that provide protective coats with protective resilient wristlets secured through a thumb opening shall be permitted to provide gloves of the gauntlet type for use with these protective coats.

**7.2.4.2** Fire departments that do not provide such wristlets attached to all protective coats shall provide gloves of the wristlet type for use with these protective coats.

**7.2.5** The fire department shall adopt and maintain a protective clothing and protective equipment program that addresses the selection, care, maintenance, and safe use of structural fire fighting protective ensembles and training in its use.

**7.2.5.1** The selection, care, and maintenance of protective ensembles for structural fire fighting shall be as specified in NFPA 1851.

**7.2.5.2** Specific responsibilities shall be assigned for inspection and maintenance.

**7.2.6** The fire department shall require all members to wear all the protective ensemble specific to the operation.

## **7.3 Protective Clothing for Proximity Fire-Fighting Operations.**

**7.3.1\*** Members whose primary responsibility is proximity fire fighting operations and members who participate in proximity fire fighting training shall be provided with and shall use proximity fire fighting protective ensembles that are compliant with NFPA 1976, *Standard on Protective Ensemble for Proximity Fire Fighting*.

**7.3.2** The proximity protective coat and proximity protective trousers shall have at least a 2 in. (50 mm) overlap of all layers so there is no gapping of the total thermal and radiant heat protection when the protective garments are worn.

**7.3.2.1** The minimum overlap shall be determined by measuring the garments on the wearer, without SCBA, in both of the following positions:

(1) Position A — standing, hands together reaching overhead as high as possible

(2) Position B — standing, hands together reaching overhead, with body bent forward at a 90-degree angle, to the side (either left or right), and to the back

**7.3.3** Single-piece proximity protective coveralls shall not be required to have an overlap of all layers, provided there is continuous full thermal and radiant heat protection.

**7.3.4** Where SCBA is worn over or outside the proximity protective garment, the fire department shall inform the member of the potential high levels of radiant heat that can result in the failure of the SCBA.

**7.3.4.1** The fire department shall require additional approved radiant reflective criteria, including but not limited to a protective cover, for the expected proximity fire-fighting exposures when the SCBA is worn over or outside the proximity protective garment.

## **7.4\* Protective Clothing for Emergency Medical Operations.**

**7.4.1** Members who perform emergency medical care or are otherwise likely to be exposed to blood or other body fluids shall be provided with emergency medical garments, emergency medical face protection devices, emergency medical examination gloves, emergency medical work gloves, and emergency medical footwear or emergency medical footwear covers that are compliant with NFPA 1999, *Standard on Protective Clothing for Emergency Medical Operations*.

**7.4.2\*** Members shall wear emergency medical examination gloves when providing emergency medical care.

**7.4.2.1** Patient care shall not be initiated before the gloves are in place.

**7.4.3\*** The fire department shall provide all fire fighters who perform emergency medical care or are likely to be exposed to airborne infectious disease with NIOSH-approved Type C respirators certified to meet 42 CFR 84, *Approval of respiratory protective devices*.

**7.4.4** Each member shall use emergency medical garments and emergency medical face protection devices prior to any patient care during which large splashes of body fluids can occur, such as situations involving spurting blood or childbirth.

**7.4.5** Contaminated emergency medical protective clothing shall be cleaned and disinfected or disposed of as specified in NFPA 1581.

**7.4.5.1** Emergency medical examination gloves and emergency medical footwear covers shall not be reused and shall be disposed of after each use.

**7.4.5.2** Any item of emergency medical protective clothing that is not designated for "multiple use" shall not be reused and shall be disposed of after each use.

## **7.5\* Chemical-Protective Clothing for Hazardous Materials Emergency Operations.**

### **7.5.1\* Vapor-Protective Garments.**

**7.5.1.1** Members who engage in operations during hazardous materials emergencies that will expose them to known chemicals in vapor form or to unknown chemicals shall be provided with and shall use vapor-protective suits.

**7.5.1.2** Vapor-protective suits shall meet the applicable requirements of NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies*.

**7.5.1.3** Prior to use, the incident commander shall consult the technical data package, manufacturers' instructions, and manufacturers' recommendations as provided and required by NFPA 1991, to assure that the garment is appropriate for the specific hazardous materials emergency.

**7.5.1.4** All members who engage in operations during hazardous materials emergencies that will expose them to known chemicals in vapor form or to unknown chemicals shall be provided with and shall use SCBA that meet the applicable requirements of Section 7.11.

**7.5.1.4.1** Additional outside air supplies shall be permitted to be utilized in conjunction with SCBA, provided such systems are positive pressure and have been certified by NIOSH under 42 CFR 84.

**7.5.1.5\*** Vapor-protective suits shall not be used alone for any fire-fighting applications or for protection from radiological, biological, or cryogenic agents, or in flammable or explosive atmospheres.

**7.5.1.6** Vapor-protective suits shall be permitted to be used for protection from liquid splashes or solid chemicals and particulates.

### **7.5.2\* Liquid Splash-Protective Garments.**

**7.5.2.1** Members who engage in operations during hazardous chemical emergencies that will expose them to known chemicals in liquid-splash form shall be provided with and shall use liquid splash-protective suits.

**7.5.2.2** Liquid splash-protective suits shall meet the applicable requirements of NFPA 1992, *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies*.

**7.5.2.3** Prior to use of the garment, the incident commander shall consult the technical data package, manufacturers' instructions, and manufacturers' recommendations as provided and required by NFPA 1992, to assure that the garment is appropriate for the specific hazardous chemical emergency.



**7.5.2.4** All members who engage in operations during hazardous chemical emergencies that will expose them to known chemicals in liquid-splash form shall be provided with and shall use either SCBA that meet the applicable requirements of 7.11.1 or respiratory protective devices that are certified by NIOSH under 42 CFR 84 as suitable for the specific chemical environment.

**7.5.2.4.1** Additional outside air supplies shall be permitted to be utilized in conjunction with SCBA, provided such systems are positive pressure and have been certified by NIOSH under 42 CFR 84.

**7.5.2.5** Liquid splash-protective suits shall not be used for protection from chemicals in vapor form or from unknown liquid chemicals or chemical mixtures.

**7.5.2.5.1** Only vapor-protective suits specified in 7.5.1 and SCBA specified in 7.11.1 shall be considered for use.

**7.5.2.6** Liquid splash-protective suits shall not be used for protection from chemicals or specific chemical mixtures with known or suspected carcinogenicity as indicated by any one of the following documents:

- (1) *Sax's Dangerous Properties of Industrial Materials*
- (2) *NIOSH Pocket Guide to Chemical Hazards*
- (3) U.S. Coast Guard *Chemical Hazard Response Information System (CHRIS)*.

**7.5.2.7** Liquid splash-protective suits shall not be used for protection from chemicals or specific chemical mixtures with skin toxicity notations as indicated by the American Conference of Governmental Industrial Hygienists, TLVs® and BEIs®.

**7.5.2.8\*** Liquid splash-protective suits shall not be used alone for any fire-fighting applications or for protection from radiological, biological, or cryogenic agents, from flammable or explosive atmospheres, or from hazardous chemical vapor atmospheres.

**7.5.2.9** Liquid splash-protective suits shall be permitted to be used for protection from solid chemicals and particulates.

### **7.5.3 Protective Ensembles for Chemical and Biological Terrorism Incidents.**

**7.5.3.1** Members who engage in assessment, extrication, rescue, triage, treatment decontamination, and support function operations involving chemical or biological terrorism incidents shall be provided with the protective ensembles and protective equipment specified in 7.5.3.3, through 7.5.3.5.

**7.5.3.2\*** The approach to any potentially hazardous atmosphere, including biological hazards, shall be made with a plan that includes an assessment of the hazard and exposure potential, respiratory protection needs, entry conditions, exit routes, and decontamination strategies.

**7.5.3.2.1** Before emergency response personnel are assigned to operations at chemical or biological terrorism incidents, the incident commander shall perform a risk assessment of the incident to determine the needs of the protective ensembles and protective equipment.

**7.5.3.3** Where the risk assessment indicates one or more of the following, all members who will be performing the operations shall be provided with and shall use at least Class 1 ensembles certified as compliant with NFPA 1994, *Standard on Protective Ensembles for Biological/ Chemical Terrorism Incidents*:

- (1) There is an ongoing release of the agent with likely gas/vapor exposure.
- (2) The identity or concentration of the vapor or liquid agent is unknown.
- (3) Liquid contact is expected, and no direct skin contact can be permitted.
- (4) Exposure of members could be at levels that would result in substantial possibility of immediate death, immediate serious incapacitation, or a severely impaired ability to escape.
- (5) Most victims in the area appear to be unconscious or dead.
- (6) Members will be close to the point of release.

**7.5.3.3.1** All members who engage in operations involving chemical or biological terrorism incidents and who are required to wear Class 1 protective ensembles that meet NFPA 1994, or wear vapor protective ensembles that meet NFPA 1991 shall be provided with and shall use either of the following respiratory protection:

- (1) SCBA that meet the applicable requirements of 7.11.1, provided that the SCBA is fully encapsulated by the protective ensemble,
- (2) Open-circuit SCBA that are certified by NIOSH as compliant with the *NIOSH Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Open Circuit Self-Contained Breathing Apparatus (SCBA)*

**7.5.3.3.2** Use of vapor-protective ensembles certified as compliant with NFPA 1991, and certified as compliant with the optional chemical and biological terrorism requirements as specified in NFPA 1991, shall be permitted where the risk assessment indicates that NFPA 1994 Class 1 ensembles would provide the necessary protection for the incident or operation.

**7.5.3.4** Where the risk assessment indicates one or more of the following, all members who will be performing the operations shall be provided with and shall use at least Class 2 ensembles certified as compliant with NFPA 1994:

- (1) The agent or threat has generally been identified.
- (2) The actual release has subsided except for where the potential for direct contact with residual vapor or gas is probable.
- (3) Surfaces at the emergency scene are highly contaminated.
- (4) Victims in the area are symptomatic, not ambulatory, but showing signs of movement.

**7.5.3.4.1** All members who engage in operations during chemical and biological terrorism incidents and who are required to wear NFPA 1994 Class 2 ensembles shall use one of the following:

- (1) SCBA that meet the applicable requirements of 7.11.1, provided that the SCBA is fully encapsulated by the protective ensemble
- (2) Open-circuit SCBA that are certified by NIOSH as compliant with *NIOSH Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Open Circuit Self-Contained Breathing Apparatus (SCBA)*
- (3) Air purifying respirator (APR) with a minimum rated service life of at least 30 minutes that are certified by NIOSH as compliant with *NIOSH Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air Purifying Respirator (APR)*

**7.5.3.5** Where the risk assessment indicates one or more of the following, all members who will be performing the operations shall be provided with and shall use at least Class 3 ensembles certified as compliant with NFPA 1994.

- (1) Exposure to liquids is expected to be incidental through contact with contaminated surfaces or victims well after the release has occurred.
- (2) Victims are symptomatic but ambulatory.
- (3) Operations are in the peripheral zone of the release scene for such functions as decontamination, patient care, crowd control, perimeter control, traffic control, and clean-up.

**7.5.3.5.1** All members who engage in operations during chemical and biological terrorism incidents and who are required to wear NFPA 1994 Class 3 ensembles shall use one of the following types of respirators:

- (1) SCBA that meet the applicable requirements of 7.11.1, provided that the SCBA is fully encapsulated by the protective ensemble
- (2) Open-circuit SCBA that are certified by NIOSH as compliant with *NIOSH Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Open Circuit Self-Contained Breathing Apparatus (SCBA)*
- (3) APR with a minimum rated service life of at least 30 minutes that are certified by NIOSH as compliant with *NIOSH Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air Purifying Respirator (APR)*

**7.5.3.6** Vapor-protective ensembles, certified as compliant with NFPA 1991, and certified as compliant with the optional chemical and biological terrorism requirements specified in NFPA 1991, that are used in operations involving any exposure to chemical or biological terrorism agents shall be decontaminated following that use or shall be disposed of where decontamination will not stop the chemical or biological assault on the ensemble and the protective qualities would be diminished or nullified.

**7.5.3.7** All NFPA 1994 Class 1, Class 2, and Class 3 protective ensembles that are used in operations involving any exposure to chemical or biological terrorism agents shall be disposed of following that use.

**7.5.3.8** Disposal shall be in accordance with applicable local, state/provincial, and federal regulations.

**7.5.3.9** All chemical/biological protective ensembles shall be inspected and maintained as required by the technical data package and manufacturer's instructions.

### **7.6 Inspection, Maintenance, and Disposal of Chemical-Protective Clothing.**

**7.6.1** All chemical-protective clothing shall be inspected and maintained as required by the technical data package, manufacturers' instructions, and manufacturers' recommendations.

**7.6.2** All chemical-protective clothing that receives a significant exposure to a chemical or chemical mixture shall be disposed of if decontamination will not stop the chemical assault on the garment and the protective qualities will be diminished or nullified.

**7.6.2.1** Disposal shall be in accordance with applicable state or federal regulations.

### **7.7 Protective Clothing and Equipment for Wildland Fire Fighting.**

**7.7.1\*** The fire department shall establish standard operating procedures for the use of wildland protective clothing and equipment.

**7.7.2** Members who engage in or are exposed to the hazards of wildland fire-fighting operations shall be provided with and use protective garments that meet the requirements of NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting*.

**7.7.3\*** Members who engage in or are exposed to the hazards of wildland fire-fighting operations shall use a protective helmet that meets the requirements of NFPA 1977.

**7.7.4** Members who engage in or are exposed to the hazards of wildland fire-fighting operations shall use protective gloves that meet the requirements of NFPA 1977.

**7.7.5** Members who engage in or are exposed to the hazards of wildland fire-fighting operations shall use protective footwear that meets the requirements of NFPA 1977.

**7.7.6** Members who engage in or are exposed to the hazards of wildland fire-fighting operations shall be provided with an approved fire shelter, in a crush-resistant case, and wear it in such a way as to allow for rapid deployment.

### **7.8 Protective Ensembles for Technical Rescue Operations.**

**7.8.1** Members of special teams whose primary function is search, rescue, recovery, and site stabilization operations for technical rescue incidents other than wilderness or water rescue incidents shall be provided with and shall use a protective ensemble that is certified as compliant with NFPA 1951.

**7.8.2** The protective coat and protective trousers shall have at least a 2 in. (50 mm) overlap of all layers so there is no gaping of the total thermal and barrier protection when the protective garments are worn.

**7.8.2.1** The minimum overlap shall be determined by measuring the garments on the wearer, without respiratory protection, in both of the following conditions:

(1) Position A — standing, hands together reaching overhead as high as possible.

(2) Position B — standing, hands together reaching overhead, with the body bent forward at a 90-degree angle, with the body bent to either the left or right side, and with the body bent to the back.

**7.8.2.2** Single-piece protective coveralls shall not be required to have an overlap of all

layers provided there is continuous composite protection.

**7.8.3** Members engaged in technical rescue operations that require respiratory protection shall be provided with and shall use respirators that are certified by NIOSH to 42 CFR Part 84.

**7.8.3.1\*** Where air purifying respirators (APR) and powered air purifying respirators (PAPR) are selected to provide the respiratory protection, the APRs and PAPRs shall be provided with the proper chemical or particulate filter elements that provide protection against the specific contaminants based upon the anticipated level of exposure risk associated with different response situations.

**7.8.3.2\*** Where it cannot be determined that an APR or PAPR will provide effective protection against the contaminant, or if the identity of the contaminant is not known, SCBA shall be worn until it can be determined that other respiratory protection can be used.

**7.8.3.3** Where SCBA are selected to provide the respiratory protection, the SCBA shall meet the applicable requirements of 7.11.1

**7.8.4** Technical rescue protective clothing and protective equipment shall be used and maintained in accordance with manufacturer's instructions.

**7.8.4.1** The fire department shall establish a maintenance and inspection program for technical rescue protective clothing and equipment.

**7.8.4.2** Proper decontamination procedures for all technical rescue protective clothing and equipment shall be followed to prevent contamination of the user or support personnel.

### **7.9 Respiratory Protection Program.**

**7.9.1** The fire department shall adopt and maintain a respiratory protection program that addresses the selection, care, maintenance, and safe use of respiratory protection equipment, medical surveillance, training in respirator use, and the assurance of air quality.

**7.9.1.1\*** The selection, care, and maintenance of open-circuit SCBA shall be as specified in NFPA 1852, *Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)*.

**7.9.1.2** Training in respirator use shall include knowledge of hazards, hazard assessment, selection of proper respiratory protective equipment based on hazard exposure levels, proper fit testing of respirators, and respirator inspection.

**7.9.2** The fire department shall develop and maintain standard operating procedures that are compliant with this standard and that address the safe use of respiratory protection.

**7.9.3** Members shall be tested and certified at least annually in the safe and proper use of respiratory protection equipment that they are authorized to use.

**7.9.4\*** Reserve SCBA shall be provided to maintain the required number in service when maintenance or repairs are being conducted.

**7.9.5** An adequate reserve air supply shall be provided by use of reserve cylinders or by an on-scene refill capability, or both.

**7.9.6** Respiratory protection equipment shall be stored in a ready-for-use condition and shall be protected from damage or exposure to rough handling, excessive heat or cold, moisture, or other elements.

**7.9.7\*** When engaged in any operation where they could encounter atmospheres that are immediately dangerous to life or health (IDLH) or potentially IDLH or where the atmosphere is unknown, the fire department shall provide and require all members to use SCBA that has been certified as being compliant with NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service*.

**7.9.8\*** Members using SCBA shall not compromise the protective integrity of the SCBA for any reason when operating in IDLH, potentially IDLH, or unknown atmospheres by removing the facepiece or disconnecting any portion of the SCBA that would allow the ambient atmosphere to be breathed.

**7.10 Breathing Air.** Breathing air used to fill SCBA cylinders shall meet the requirements specified in NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*.

### **7.11 Respiratory Protection Equipment.**

#### **7.11.1 SCBA.**

**7.11.1.1** All open-circuit SCBA that is purchased new shall be certified as compliant with NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*, and shall also be certified by NIOSH as compliant with NIOSH *Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Open Circuit Self-Contained Breathing Apparatus (SCBA)*.

**7.11.1.2\*** Open-circuit SCBA that does not meet the 1992 or later editions of NFPA 1981 shall be removed from fire service use.

**7.11.1.3\*** Closed-circuit SCBA shall be permitted when long-duration SCBA is required.

**7.11.1.4** Closed-circuit SCBA shall be NIOSH certified with a minimum rated service life of at least 2 hours and shall operate in the positive-pressure mode only.

#### **7.11.2 Supplied-Air Respirators.**

**7.11.2.1** Supplied-air respirator units used shall be of the type and manufacture employed by the authority having jurisdiction.

**7.11.2.2** Supplied-air respirators other than SCBA shall not be used in IDLH atmospheres unless equipped with a NIOSH-certified emergency escape air cylinder and a pressure-demand facepiece.

**7.11.2.3** Supplied-air respirators, Type C Pressure-Demand Class, shall not be used in IDLH atmospheres unless they meet manufacturers' specifications for that purpose.

#### **7.11.3 Full Facepiece Air-Purifying Respirators.**

**7.11.3.1** Full facepiece air-purifying respirators shall be used only in non-IDLH atmospheres for those contaminants that NIOSH certifies them against.

**7.11.3.2** The authority having jurisdiction shall provide NIOSH-certified respirators that protect the user and ensure compliance with all other OSHA requirements.

**7.11.3.3\*** The authority having jurisdiction shall establish a policy to ensure canisters and cartridges are changed before the end of their service life.

**7.12 Fit Testing.**

**7.12.1\*** The facepiece seal capability of each member qualified to use respiratory protection equipment shall be verified by qualitative or quantitative fit testing on an annual basis and whenever new types of respiratory protection equipment or facepieces are issued.

**7.12.2** The fit of the respiratory protection equipment of each new member shall be tested before the members are permitted to use respiratory protection equipment in a hazardous atmosphere.

**7.12.2.1** Only members with a properly fitting facepiece shall be permitted by the fire department to function in a hazardous atmosphere with respiratory protection equipment.

**7.12.3** Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative or qualitative fit testing in the negative pressure mode, regardless of the mode of operation (negative or positive pressure) that is used for respiratory protection.

**7.12.4\*** Qualitative or quantitative test protocols shall be conducted as required by the authority having jurisdiction.

**7.12.5** Records of facepiece fitting tests shall include at least the following information:

- (1) Name of the member tested
- (2) Type of fitting test performed
- (3) Specific make and model of facepieces tested
- (4) Pass/fail results of the tests

**7.12.6\*** For departments that perform quantitative fitting tests, the protection factor produced shall be at least 500 for negative-pressure facepieces for the person to pass the fitting test with that make of full facepiece.

**7.13 Using Respiratory Protection.**

**7.13.1** Respirators shall not be worn when a member has any conditions that prevent a good face seal.

**7.13.2** Nothing shall be allowed to enter or pass through the area where the respiratory protection facepiece is designed to seal with the face, regardless of the specific fitting test measurement that can be obtained.

**7.13.3\*** Members who have a beard or facial hair at any point where the facepiece is designed to seal with the face or whose hair could interfere with the operation of the unit shall not be permitted to use respiratory protection at emergency incidents or in hazardous or potentially hazardous atmospheres.

**7.13.3.1** These restrictions shall apply regardless of the specific fitting test measurement that can be obtained under test conditions.

**7.13.4** When a member must wear spectacles while using a full facepiece respiratory protection, the facepiece shall be fitted with spectacles in such a manner that it shall not interfere with the facepiece-to-face seal.

**7.13.5** Spectacles with any strap or temple bars that pass through the facepiece-to-face seal area shall be prohibited.

**7.13.6\*** Use of contact lenses shall be permitted during full facepiece respiratory protection use, provided that the member has previously demonstrated successful long-term contact lens use.

**7.13.7** Any head covering that passes between the sealing surface of the respiratory protection facepiece and the member's face shall be prohibited.

**7.13.8** The respiratory protection facepiece and head harness with straps shall be worn under the protective hoods.

**7.13.9** The respiratory protection facepiece and head harness with straps shall be worn under the head protection of any hazardous chemical-protective clothing.

**7.13.10** Helmets shall not interfere with the respiratory protection facepiece-to-face seal.

**7.14 SCBA Cylinders.**

**7.14.1\*** SCBA cylinders made of aluminum alloy 6351-T6 shall be inspected annually, both externally and internally, by a qualified person.

**7.14.2** SCBA cylinders shall be hydrostatically tested as required by the manufacturers and applicable governmental agencies.

**7.14.3** In-service SCBA cylinders shall be stored fully charged.

**7.14.4** In-service SCBA cylinders shall be inspected weekly, monthly, and prior to filling according to NIOSH requirements, CGA standards, and manufacturers' recommendations.

**7.14.5\*** During filling of SCBA cylinders, all personnel and operators shall be protected from catastrophic failure of the cylinder.

**7.14.6\*** Fire departments utilizing rapid filling of SCBA cylinders shall identify those unique emergency situations where rapid filling shall be permitted to occur.

**7.14.7** The fire department risk assessment process shall incorporate standard operating procedures to identify those situations in 7.14.6.

**7.14.8** Rapid refilling of SCBA while being worn by the user shall only be used under the following conditions:

- (1) NIOSH approved fill options are used.
- (2) The risk assessment process has identified procedures for limiting personnel exposure during the refill process and has provided for adequate equipment inspection and member safety.
- (3) An imminent life-threatening situation occurs that requires immediate action to prevent the loss of life or serious injury.

**7.14.9** In an emergency situation where an individual becomes disoriented, runs low on air, is trapped or injured and cannot be moved to a safe atmosphere, and danger of serious injury or death is likely, rapid fill (in accordance with 7.14.6), air transfer, or a supplied-air source shall be an approved method to provide a source of breathing air and shall be used in accordance with the manufacturers' instructions.

**7.14.10** If a supplied source is not immediately available, transfilling of cylinders shall be done in accordance with the manufacturers' instructions.

**7.15 Personal Alert Safety System (PASS).**

**7.15.1** PASS devices shall meet the requirements of NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*.

**7.15.2\*** New SCBA purchased by fire departments shall include an integrated PASS.

**7.15.3\*** Each member shall be provided with, use, and activate his or her PASS devices in all emergency situations that could jeopardize that person's safety due to atmospheres that could be IDLH, in incidents that could result in entrapment, in structural collapse of any type, or as directed by the incident commander or incident safety officer.

**7.15.4** Each PASS device shall be tested at least weekly and prior to each use and shall be maintained in accordance with the manufacturers' instructions.

**7.16 Life Safety Rope and System Components.**

**7.16.1** All life safety ropes, harnesses, and hardware used by fire departments shall meet the applicable requirements of NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components*.

**7.16.2** Rope used to support the weight of members or other persons during rescue, fire fighting, other emergency operations or during training evolutions shall be life safety rope and shall meet the requirements of NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components*.

**7.16.2.1** Life safety rope used for any other purpose shall be removed from service and destroyed.

**7.16.3\*** Life safety rope used for rescue at fires or other emergency incidents or for training shall be permitted to be reused if inspected before and after each such use in accordance with the manufacturers' instructions and provided that the following criteria are met:

- (1) The rope has not been visually damaged by exposure to heat, direct flame impingement, chemical exposure, or abrasion.
- (2) The rope has not been subjected to any impact load.
- (3) The rope has not been exposed to chemical liquids, solids, gases, mists, or vapors of any material known to deteriorate rope.

**7.16.3.1** If the rope used for rescue at fires or other emergency incidents or for training does not meet the criteria set forth in 7.16.3(1), 7.16.3(2), or 7.16.3(3) or fails the visual inspection, it shall be destroyed.

**7.16.3.2** If there is any question regarding the serviceability of the rope after consideration of the criteria listed in 7.16.3, the rope shall be taken out of service.

**7.16.4** Life safety rope used for any other purpose shall be removed from service and destroyed.

**7.16.5** Rope inspection shall be conducted by qualified inspectors in accordance with rope inspection procedures established and recommended as adequate by the rope manufacturer to assure rope is suitable for reuse.

**7.16.6** Records shall be maintained to document the use of each life safety rope used at fires and other emergency incidents or for training.

### **7.17 Face and Eye Protection.**

**7.17.1** Primary face and eye protection appropriate for a given specific hazard shall be provided for and used by members exposed to that specific hazard.

**7.17.1.1** Such primary face and eye protection shall meet the requirements of ANSI Z87.1, *Practice for Occupational and Educational Eye and Face Protection*.

**7.17.2** The full facepiece of SCBA shall constitute face and eye protection when worn.

**7.17.2.1** SCBA that has a facepiece-mounted regulator that when disconnected provides a direct path for flying objects to strike the face or eyes shall have the regulator attached in order to be considered face and eye protection.

**7.17.3** When operating in the hazardous area at an emergency scene without the full facepiece of respiratory protection being worn, members shall wear appropriate eye protection.

### **7.18 Hearing Protection.**

**7.18.1\*** Hearing protection shall be provided for and used by all members operating or riding on fire apparatus when subject to noise in excess of 90 dBA.

**7.18.2\*** Hearing protection shall be provided for and used by all members when exposed to noise in excess of 90 dBA caused by power tools or equipment, other than in situations where the use of such protective equipment would create an additional hazard to the user.

**7.18.3\*** The fire department shall engage in a hearing conservation program to identify and reduce or eliminate potentially harmful sources of noise in the work environment.

### **7.19 New and Existing Protective Clothing and Protective Equipment.**

**7.19.1** All new protective clothing and protective equipment shall meet the requirements of the current edition of the appropriate NFPA standard for that particular protective clothing or protective equipment.

**7.19.2** Existing protective clothing and protective equipment shall have been in compliance with the edition of the respective NFPA standard that was current when the protective clothing or protective equipment was manufactured.

**7.19.3** Members' personal protective ensembles shall be taken out of service after 15 years from date of manufacture, regardless of testing or inspection procedures.

## **Chapter 8 Emergency Operations**

### **8.1 Incident Management.**

**8.1.1\*** Emergency operations and other situations that pose similar hazards, including but not limited to training exercises, shall be conducted in a manner that recognizes hazards and prevents accidents and injuries.

**8.1.2** An incident management system that meets the requirements of NFPA 1561 shall be established with written standard operating procedures applying to all members involved in emergency operations.

**8.1.3** The incident management system shall be utilized at all emergency incidents.

**8.1.4** The incident management system shall be applied to drills, exercises, and other situations that involve hazards similar to those encountered at actual emergency incidents and to simulated incidents that are conducted for training and familiarization purposes.

**8.1.5\*** At an emergency incident, the incident commander shall be responsible for the overall management of the incident and the safety of all members involved at the scene.

**8.1.6** As incidents escalate in size and complexity, the incident commander shall divide the incident into tactical-level management components and assign an incident safety officer to assess the incident scene for hazards or potential hazards.

**8.1.7\*** At an emergency incident, the incident commander shall establish an organization with sufficient supervisory personnel to control the position and function of all members operating at the scene and to ensure that safety requirements are satisfied.

**8.1.8\*** At an emergency incident, the incident commander shall have the responsibility for the following:

- (1) Arrive on-scene before assuming command.

- (2) Assume and confirm command of an incident and take an effective command position.

- (3) Perform situation evaluation that includes risk assessment.

- (4) Initiate, maintain, and control incident communications.

- (5) Develop an overall strategy and an incident action plan and assign companies and members consistent with the standard operating procedures.

- (6) Initiate an accountability and inventory worksheet.

- (7) Develop an effective incident organization by managing resources, maintaining an effective span of control, and maintaining direct supervision over the entire incident, and designate supervisors in charge of specific areas or functions.

- (8) Review, evaluate, and revise the incident action plan as required.

- (9) Continue, transfer, and terminate command.

- (10) On incidents under the command authority of the fire department, provide for liaison and coordination with all other cooperating agencies.

- (11) On incidents where other agencies have jurisdiction, implement a plan that designates one incident commander or that provides for unified command.

**8.1.8.1** Interagency coordination shall meet the requirements of NFPA 1561.

### **8.2 Communications.**

**8.2.1** The fire department shall establish and ensure the maintenance of a fire dispatch and incident communications system that meets the requirements of NFPA 1561 and NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*.

**8.2.2\*** The fire department standard operating procedures shall provide direction in the use of clear text radio messages for emergency incidents.

**8.2.2.1** The standard operating procedures shall use "emergency traffic" as a designator to clear the radio traffic.

**8.2.2.2** This "emergency traffic" shall be permitted to be declared by the incident commander, tactical level management component supervisor, or member in trouble or subjected to emergency conditions.

**8.2.3\*** When a member has declared "emergency traffic," that person shall use clear text to identify the type of emergency, change in conditions, or tactical operations.

**8.2.3.1** The member who has declared the "emergency traffic" shall conclude the "emergency traffic" message by transmitting "all clear, resume radio traffic" to end the emergency situation or to re-open the radio channels to communication after announcing the emergency message.

**8.2.4\*** The fire department communications center shall start an incident clock when the first arriving unit is on-scene of a working structure fire or hazardous materials incident, or when other conditions appear to be time sensitive or dangerous.

**8.2.4.1\*** The dispatch center shall notify the incident commander at every 10-minute increment with the time that resources have been on the incident until the fire is knocked down or the incident becomes static.

**8.2.4.2** The incident commander shall be permitted to cancel the incident clock notification through the fire department communications center based on the incident conditions.

### **8.3 Risk Management During Emergency Operations.**

**8.3.1\*** The incident commander shall integrate risk management into the regular functions of incident command.

**8.3.2\*** The concept of risk management shall be utilized on the basis of the following principles:

- (1) Activities that present a significant risk to the safety of members shall be limited to situations where there is a potential to save endangered lives.

- (2) Activities that are routinely employed to protect property shall be recognized as inherent risks to the safety of members, and actions shall be taken to reduce or avoid these risks.

- (3) No risk to the safety of members shall be acceptable when there is no possibility to save lives or property.

- (4) In situations where the risk to fire department members is excessive, activities shall be limited to defensive operations.

**8.3.3\*** The incident commander shall evaluate the risk to members with respect to the purpose and potential results of their actions in each situation.

**8.3.4** Risk management principles shall be routinely employed by supervisory personnel at all levels of the incident management system to define the limits of acceptable and unacceptable positions and functions for all members at the incident scene.

**8.3.5\*** At significant incidents and special operations incidents, the incident commander shall assign an incident safety officer that has the expertise to evaluate hazards and provide direction with respect to the overall safety of personnel.

**8.3.6** At terrorist incidents or other incidents involving potential nuclear, biological, and chemical exposure, the incident commander shall exercise risk management practice and ensure that appropriate protective equipment is available for and used by members at risk.

**8.3.7\*** Because of the possibility of members being exposed to nerve agents during terrorist activities, fire departments shall consider providing atropine auto-injectors for members.

#### **8.4 Personnel Accountability During Emergency Operations.**

**8.4.1\*** The fire department shall establish written standard operating procedures for a personnel accountability system that is in accordance with NFPA 1561.

**8.4.2** The fire department shall consider local conditions and characteristics in establishing the requirements of the personnel accountability system.

**8.4.3** It shall be the responsibility of all members operating at an emergency incident to actively participate in the personnel accountability system.

**8.4.4** The incident commander shall maintain an awareness of the location and function of all companies or crews at the scene of the incident.

**8.4.5** Officers assigned the responsibility for a specific tactical level management component at an incident shall directly supervise and account for the companies and/or crews operating in their specific area of responsibility.

**8.4.6** Company officers shall maintain an ongoing awareness of the location and condition of all company members.

**8.4.7** Where assigned as a company, members shall be responsible to remain under the supervision of their assigned company officer.

**8.4.8** Members shall be responsible for following personnel accountability system procedures.

**8.4.9** The personnel accountability system shall be used at all incidents.

**8.4.10\*** The fire department shall develop, implement, and utilize the system components required to make the personnel accountability system effective.

**8.4.11\*** The standard operating procedures shall provide the use of additional accountability officers based on the size, complexity, or needs of the incident.

**8.4.12** The incident commander and members who are assigned a supervisory responsibility for a tactical level management component that involves multiple companies or crews under their command shall have assigned a member(s) to facilitate the ongoing tracking and accountability of assigned companies and crews.

#### **8.5 Members Operating at Emergency Incidents.**

**8.5.1** The fire department shall provide an adequate number of personnel to safely conduct emergency scene operations.

**8.5.1.1\*** Operations shall be limited to those that can be safely performed by the personnel available at the scene.

**8.5.2** No member or members shall commence or perform any fire-fighting function or evolution that is not within the established safety criteria of the organizational statement as specified in 4.1.1.

**8.5.3** When inexperienced members are working at an incident, direct supervision shall be provided by more experienced officers or members.

**8.5.3.1** The requirement of 8.5.3 shall not reduce the training requirements contained in 5.1.3 and 5.1.4.

**8.5.4\*** Members operating in hazardous areas at emergency incidents shall operate in crews of two or more.

**8.5.5** Crew members operating in hazardous areas shall be in communication with each other through visual, audible, or physical means or safety guide rope, in order to coordinate their activities.

**8.5.6** Crew members shall be in proximity to each other to provide assistance in case of emergency.

**8.5.7\*** In the initial stages of an incident where only one crew is operating in the hazardous area at a working structural fire, a minimum of four individuals shall be required, consisting of two individuals working as a crew in the

hazardous area and two individuals present outside this hazardous area available for assistance or rescue at emergency operations where entry into the danger area is required.

**8.5.8** The standby members shall be responsible for maintaining a constant awareness of the number and identity of members operating in the hazardous area, their location and function, and time of entry.

**8.5.9** The standby members shall remain in radio, visual, voice, or signal line communication with the crew.

**8.5.10** The “initial stages” of an incident shall encompass the tasks undertaken by the first arriving company with only one crew assigned or operating in the hazardous area.

**8.5.11\*** One standby member shall be permitted to perform other duties outside of the hazardous area, such as apparatus operator, incident commander, or technician or aide, provided constant communication is maintained between the standby member and the members of the crew.

**8.5.12** The assignment of any personnel, including the incident commander, the safety officer, or operators of fire apparatus, shall not be permitted as standby personnel if by abandoning their critical task(s) to assist or, if necessary, perform rescue, they clearly jeopardize the safety and health of any fire fighter working at the incident.

**8.5.12.1** No one shall be permitted to serve as a standby member of the fire-fighting crew when the other activities in which the fire fighter is engaged inhibit the fire fighter’s ability to assist in or perform rescue, if necessary, or are of such importance that they cannot be abandoned without placing other fire fighters in danger.

**8.5.13** The standby member shall be provided with at least the appropriate full protective clothing, protective equipment, and SCBA.

**8.5.13.1** The full protective clothing, protective equipment, and SCBA shall be immediately accessible for use by the outside crew if the need for rescue activities inside the hazardous area occurs.

**8.5.14** The standby members shall don full protective clothing, protective equipment, and SCBA prior to entering the hazardous area.

**8.5.15** When only a single crew is operating in the hazardous area in the initial stages of the incident, this standby member shall be permitted to assist with, or if necessary perform, rescue for members of his/her crew, provided that abandoning his/her task does not jeopardize the safety or health of the crew.

**8.5.16** Once a second crew is assigned or operating in the hazardous area, the incident shall no longer be considered in the “initial stage,” and at least one rapid intervention crew shall be deployed that complies with the requirements of 8.8.2.

**8.5.17** Initial attack operations shall be organized to ensure that, if on arrival at the emergency scene, initial attack personnel find an imminent life-threatening situation where immediate action could prevent the loss of life or serious injury, such action shall be permitted with less than four personnel when conducted in accordance with 8.5.5.

**8.5.17.1** No exception as permitted in 8.5.17 shall be allowed when there is no possibility to save lives.

**8.5.17.2** Any such actions taken in accordance with 8.5.17 shall be thoroughly investigated by the fire department with a written report submitted to the fire chief.

**8.5.18\*** At aircraft rescue fire-fighting incidents, the initial IDLH shall be identified as the area within 75 ft (23 m) of the skin of the aircraft.

**8.5.18.1** After size-up, the incident commander shall adjust the IDLH designation as the situation dictates to meet operational needs.

**8.5.18.2** Aircraft rescue fire-fighting operations inside the area identified as the IDLH shall be in accordance with 8.5.4.

**8.5.19\*** When members are performing special operations, the highest available level of emergency medical care shall be standing by at the scene with medical equipment and transportation capabilities. Basic life support shall be the minimum level of emergency medical care.

**8.5.20** Emergency medical care and medical monitoring at hazardous materials incidents shall be provided by or supervised by personnel who meet the minimum requirements of NFPA 473, *Standard for Competencies for EMS Personnel Responding to Hazardous Materials Incidents*.

**8.5.21** At all other emergency operations, the incident commander shall evaluate the risk to the members operating at the scene and, if necessary, request that at least basic life support personnel and patient transportation be available.

**8.5.22** When members are operating from aerial devices, they shall be secured to the aerial device with a system in compliance with NFPA 1983.

**8.5.23** The incident commander shall ensure arson investigators or other members that enter an IDLH atmosphere or hazardous area use the appropriate personal protective equipment, SCBA, or both.

**8.5.24\*** Members involved in water rescue shall be issued and wear personal flotation devices that meet U.S. Coast Guard requirements.

## **8.6 Control Zones.**

**8.6.1** Control zones shall be established at emergency incidents.

**8.6.1.1** The perimeters of the control zones shall be designated by the incident commander and communicated to all members.

**8.6.1.2** If the perimeters of the control zones change during the course of the incident, these changes shall be communicated to all members on the scene.

**8.6.2\*** Hazard control zones shall be designated as hot, warm, and cold.

**8.6.2.1** All members shall wear all of the appropriate personal protective equipment while in the hot zone.

**8.6.2.2\*** All members operating within the hot zone shall have an assigned task.

**8.6.2.3** Where an exclusion zone is designated, no personnel shall enter the exclusion zone due to imminent hazard(s) or the need to protect evidence.

## **8.7\* Roadway Incidents.**

**8.7.1** When members are operating at an emergency incident and their assignment places them in potential conflict with motor vehicle traffic, all efforts shall be made to protect the members.

**8.7.2** Each department shall establish, implement, and enforce standard operating procedures regarding emergency operations for highway incidents.

**8.7.3** Apparatus and warning devices shall be placed to take advantage of topography and weather conditions (uphill / upwind) and to protect fire fighters from traffic.

**8.7.4** Fire apparatus shall be positioned in a blocking position, so if it is struck it will protect members and other persons at the incident scene.

**8.7.5** Fluorescent and retro-reflective warning devices such as traffic cones with DOT-approved retro-reflective collars, DOT-approved retro-reflective signs, illuminated warning devices such as highway flares, or other appropriate warning devices shall be used to warn oncoming traffic of the emergency operations.

**8.7.6** The first arriving unit shall ensure that traffic is controlled before addressing the emergency operations.

**8.7.7** Members shall position themselves and any victims in a secure area.

**8.7.8** Members shall park or stage unneeded fire apparatus and personal vehicles off the roadway whenever possible.

**8.7.9\*** When members are operating at a roadway incident and their assignment places them in potential conflict with motor vehicle traffic, they shall wear a garment with fluorescent and retro-reflective material visible from all directions.

**8.7.10\*** Members used for control traffic purposes shall receive training that is commensurate with their duties and in accordance with any applicable state and local laws and regulations.

## **8.8 Rapid Intervention for Rescue of Members.**

**8.8.1** The fire department shall provide personnel for the rescue of members operating at emergency incidents.

**8.8.2** A rapid intervention crew/company shall consist of at least two members and shall be available for rescue of a member or a crew.

**8.8.2.1** A rapid intervention crew/company shall be fully equipped with the appropriate protective clothing, protective equipment, SCBA, and any specialized rescue equipment that could be needed given the specifics of the operation under way.

**8.8.2.2** The rapid intervention crews/companies (RIC) at an incident where any SCBA being used are equipped with a RIC universal air connection (UAC) shall have the specialized rescue equipment including a fully charged breathing air cylinder with a NIOSH-certified rated service time of at least 30 minutes and compatible pressure and capacity with the SCBA being used at the incident, or a high-pressure air line of sufficient length to reach the location of the entrapped or downed fire fighter(s) and supplied by a pressurized breathing air source that can provide at least 100 L of air per minute at the RIC UAC female fitting and at a pressure compatible with the SCBA being used at the incident.

**8.8.2.3** Both the breathing air cylinder and the high-pressure air line described in 8.8.2.2 shall be equipped with a RIC UAC filling hose assembly equipped

with a RIC UAC female fitting.

**8.8.2.4** The RIC UAC filling hose assembly shall meet the requirements specified in 6.4.7 of NFPA 1981.

**8.8.2.5** The RIC UAC female fitting shall meet the requirements specified in 6.4.6 of NFPA 1981.

**8.8.2.6** The RIC UAC female fitting shall mate with the RIC UAC male fitting to form a RIC UAC coupling that meets the requirements specified in 6.4.8 of NFPA 1981.

**8.8.3** The composition and structure of a RIC shall be permitted to be flexible based on the type of incident and the size and complexity of operations.

**8.8.4\*** The incident commander shall evaluate the situation and the risks to operating crews and shall provide one or more RICs commensurate with the needs of the situation.

**8.8.5** In the early stages of an incident, which includes the deployment of a fire department's initial attack assignment, the RIC shall be in compliance with 8.5.11 and 8.5.12 and be either one of the following:

(1) On-scene members designated and dedicated as a RIC

(2) On-scene members performing other functions but ready to re-deploy to perform RIC functions

**8.8.5.1** The assignment of any personnel shall not be permitted as members of the RIC if abandoning their critical task(s) to perform rescue clearly jeopardizes the safety and health of any member operating at the incident.

**8.8.6** As the incident expands in size or complexity, which includes an incident commander's requests for additional resources beyond a fire department's initial attack assignment, the dedicated RIC shall on arrival of these additional resources be either one of the following:

(1) On-scene members designated and dedicated as RIC

(2) On-scene crew/company or crews/companies located for rapid deployment and dedicated as RICs

**8.8.6.1** During fire fighter rescue operations each crew/company shall remain intact.

**8.8.7** At least one dedicated RIC shall be standing by with equipment to provide for the rescue of members that are performing special operations or for members that are in positions that present an immediate danger of injury in the event of equipment failure or collapse.

## **8.9 Rehabilitation During Emergency Operations.**

**8.9.1\*** The fire department shall develop standard operating procedures that outline a systematic approach for the rehabilitation of members operating at incidents.

**8.9.2\*** The incident commander shall consider the circumstances of each incident and initiate rehabilitation in accordance with the standard operating procedures and with NFPA 1561.

**8.9.3\*** Such on-scene rehabilitation shall include at least rest, hydration, active cooling where required, basic life support care, food where required, and protection from extreme elements.

**8.9.4** Each member operating at an incident shall be responsible to communicate rehabilitation needs to their supervisor.

**8.9.5\*** Each member who engages in wildland fire-fighting operations shall be provided with 2 qt (2 L) of water.

**8.9.5.1** A process shall be established for the rapid replenishment of water supplies.

## **8.10 Scenes of Violence, Civil Unrest, or Terrorism.**

**8.10.1\*** Fire department members shall not become involved in any activities at the scene of domestic disturbance, civil unrest, or similar situations where there is ongoing violence without the confirmed presence of law enforcement personnel who have deemed the scene secure.

**8.10.2** Under no circumstances shall fire department equipment or personnel be used for crowd control or dispersement purposes.

**8.10.3\*** The fire department shall develop and maintain written standard operating procedures that establish a standardized approach to the safety of members at incidents that involve violence, unrest, or civil disturbance.

**8.10.4** The fire department shall be responsible for developing an interagency agreement with its law enforcement agency counterpart to provide protection for fire department members at situations that involve violence.

**8.10.5\*** The fire department shall develop a standard communication method that indicates that an incident crew is faced with a life and death situation requiring immediate law enforcement intervention.

**8.10.6** Such violent situations shall be considered essentially a law enforcement event, and the fire department shall coordinate with the law enforcement incident commander throughout the incident.

**8.10.7** The fire department incident commander shall identify and react to situations that do involve or are likely to involve violence.

**8.10.8** In such violent situations, the fire department incident commander shall communicate directly with the law enforcement incident commander to ensure the safety of fire department members.

**8.10.9** In such violent situations, the fire department incident commander shall stage all fire department resources in a safe area until the law enforcement agency has secured the scene.

**8.10.10** When violence occurs after emergency operations have been initiated, the fire department incident commander shall either secure immediate law enforcement agency protection or shall withdraw all fire department members to a safe staging area.

**8.10.11** At civil disturbances or similar incidents where protective equipment generally considered as law enforcement-related such as body armor shall be utilized only by members who are trained and qualified to use such equipment.

**8.10.12** Fire department companies or crews that provide support to law enforcement agency special weapons and tactics (SWAT) operations shall receive special training.

**8.10.12.1** Special standard operating procedures shall be developed that describe the training and safety of these fire department crews for such operations.

**8.10.12.2** These activities shall be considered as special operations for the purpose of this standard.

### 8.11 Post-Incident Analysis.

**8.11.1** The fire department shall establish requirements and standard operating procedures for a standardized post-incident analysis of significant incidents or those that involve serious injury or death to a fire fighter.

**8.11.2** The fire department incident safety officer shall be involved in the post-incident analysis as defined in NFPA 1521.

**8.11.3** The analysis shall conduct a basic review of the conditions present, the actions taken, and the effect of the conditions and actions on the safety and health of members.

**8.11.4** The analysis shall identify any action necessary to change or update any safety and health program elements to improve the welfare of members.

**8.11.5** The analysis process shall include a standardized action plan for such necessary changes.

**8.11.5.1** The action plan shall include the change needed and the responsibilities, dates, and details of such actions.

## Chapter 9 Facility Safety

### 9.1 Safety Standards.

**9.1.1\*** All fire department facilities shall comply with all legally applicable health, safety, building, and fire code requirements.

**9.1.2** Fire departments shall provide facilities for disinfecting, cleaning, and storage in accordance with NFPA 1581.

**9.1.3** All existing and new fire stations shall be provided with smoke detectors in work, sleeping, and general storage areas.

**9.1.3.1** When activated, these detectors shall sound an alarm throughout the fire station.

**9.1.4\*** All existing and new fire department facilities shall have carbon monoxide detectors installed in locations in sleeping and living areas, such that any source of carbon monoxide would be detected before endangering the members.

**9.1.5\*** All fire stations and fire department facilities shall comply with NFPA 101<sup>®</sup>, *Life Safety Code*<sup>®</sup>.

**9.1.6\*** The fire department shall prevent exposure to fire fighters and contamination of living and sleeping areas to exhaust emissions.

**9.1.7** Any components of the protective ensemble that are contaminated shall not be allowed in sleeping and living areas.

**9.1.8** All fire department facilities shall be designated smoke free.

**9.1.9** Stations utilizing poles to provide rapid access to lower floors shall ensure that the area around the pole hole is secured by means of a cover, enclosure, or other means to prevent someone from accidentally falling through the pole hole.

### 9.2 Inspections.

**9.2.1** All fire department facilities shall be inspected at least annually to provide for compliance with Section 9.1. (*See Annex G.*)

**9.2.2** Inspections shall be documented and recorded.

**9.2.3** All fire department facilities shall be inspected at least monthly to identify and provide correction of any safety or health hazards.

**9.3\* Maintenance and Repairs.** The fire department shall have an established system to maintain all facilities and to provide prompt correction of any safety or health hazard or code violation.

## Chapter 10 Medical and Physical Requirements

### 10.1 Medical Requirements.

**10.1.1** Candidates shall be medically evaluated and certified by the fire department physician.

**10.1.2** Medical evaluations shall take into account the risks and the functions associated with the individual's duties and responsibilities.

**10.1.3** Candidates and members who will engage in fire suppression shall meet the medical requirements specified in NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*, prior to being medically certified for duty by the fire department physician.

**10.1.4** Fire departments that operate their own fixed wing or rotary aircraft shall require fire department pilots who perform fire-fighting operations from the air to maintain a commercial Class 1 medical examination in conformance with Federal Aviation Agency (FAA) regulations for commercial pilots.

**10.1.5\*** Members who are under the influence of alcohol or drugs shall not participate in any fire department operations or other duties.

### 10.2 Physical Performance Requirements.

**10.2.1\*** The fire department shall develop physical performance requirements for candidates and members who engage in emergency operations.

**10.2.2** Medical certification for the use of respiratory protection shall be conducted annually.

**10.2.3** Candidates shall be certified by the fire department as meeting the physical performance requirements prior to entering into a training program to become a fire fighter.

**10.2.4** Members who engage in emergency operations shall be annually evaluated and certified by the fire department as meeting the physical performance requirements.

**10.2.5** Members who do not meet the required level of physical performance shall not be permitted to engage in emergency operations.

**10.2.6** Members who are unable to meet the physical performance requirements shall enter a physical performance rehabilitation program to facilitate progress in attaining a level of performance commensurate with the individual's assigned duties and responsibilities.

### 10.3 Health and Fitness.

**10.3.1** The fire department shall establish and provide a health and fitness program that meets the requirements of NFPA 1583, *Standard on Health-Related Fitness Programs for Fire Fighters*, to enable members to develop and maintain an appropriate level of fitness to safely perform their assigned functions.

**10.3.2** The maintenance of fitness levels specified in the program shall be based on fitness standards determined by the fire department physician that reflect the individual's assigned functions and activities and that are intended to reduce the probability and severity of occupational injuries and illnesses.

**10.3.3** The fire department health and fitness coordinator shall administer all aspects of the physical fitness and health enhancement program.

**10.3.4** The health and fitness coordinator shall act as a direct liaison between the fire department physician and the fire department in accordance with NFPA 1582.

**10.4 Confidential Health Data Base.**

**10.4.1\*** The fire department shall ensure that a confidential, permanent health file is established and maintained on each individual member.

**10.4.2** The individual health file shall record the results of regular medical evaluations and physical performance tests, any occupational illnesses or injuries, and any events that expose the individual to known or suspected hazardous materials, toxic products, or contagious diseases.

**10.4.3\*** Health information shall be maintained as a confidential record for each individual member as well as a composite data base for the analysis of factors pertaining to the overall health and fitness of the member group.

**10.4.4\*** If a member dies as a result of occupational injury or illness, autopsy results, if available, shall be recorded in the health data base.

**10.5 Infection Control.**

**10.5.1\*** The fire department shall actively attempt to identify and limit or prevent the exposure of members to infectious and contagious diseases in the performance of their assigned duties.

**10.5.2** The fire department shall operate an infection control program that meets the requirements of NFPA 1581.

**10.6 Fire Department Physician.**

**10.6.1** The fire department shall have an officially designated physician who shall be responsible for guiding, directing, and advising the members with regard to their health, fitness, and suitability for various duties.

**10.6.2** The fire department physician shall provide medical guidance in the management of the occupational safety and health program.

**10.6.3\*** The fire department physician shall be a licensed medical doctor or osteopathic physician qualified to provide professional expertise in the areas of occupational safety and health as they relate to emergency services.

**10.6.4\*** The fire department physician shall be readily available for consultation and to provide professional services on an urgent basis.

**10.6.4.1** Availability shall be permitted to be accomplished by providing access to a number of qualified physicians.

**10.6.5** The fire department shall require that the health and safety officer and the health fitness coordinator maintain a liaison with the fire department physician to ensure that the health maintenance process for the fire department is maintained.

**10.7 Fitness for Duty Evaluations**

**10.7.1** Fire departments shall establish a process to evaluate the ability of a member to perform essential job functions.

**10.7.2** The process to evaluate the fitness of a member to perform essential job functions shall be conducted by an appropriate medical professional and confirmed by the fire department physician.

**10.7.3** When a member is determined to be unable to perform the essential job functions, the member shall be provided adequate assistance, treatment, or both that is intended to return the member to condition that will allow him or her to perform the essential job functions.

**10.7.4** A member that has been determined to be unable to perform the essential job functions will only be returned to duty when an appropriate medical professional has confirmed that the member can perform the essential job functions.

**Chapter 11 Member Assistance and Wellness Programs****11.1 Member Assistance Program.**

**11.1.1\*** The fire department shall provide a member assistance program that identifies and assists members and their immediate families with substance abuse, stress, and personal problems that adversely affect fire department work performance.

**11.1.2** The assistance program shall refer members and their immediate families, as appropriate, to the proper health care services for the purpose of restoring job performance to expected levels, as well as for the restoration of better health.

**11.1.3\*** The fire department shall adopt a written policy statement on alcoholism, substance abuse, and other problems covered by the member assistance program.

**11.1.4\*** Written rules shall be established specifying how records are to be maintained, the policies governing retention and access to records, and the procedure for release of information.

**11.1.4.1** These rules shall identify to whom and under what conditions information can be released and what use, if any, can be made of records for purposes of research, program evaluation, and reports.

**11.1.5** Member records maintained by a member assistance program shall not become part of a member's personnel file.

**11.2 Wellness Program.**

**11.2.1\*** The wellness program shall provide health promotion activities that identify physical and mental health risk factors and shall provide education and counseling for the purpose of preventing health problems and enhancing overall well-being.

**11.2.2\*** The fire department shall provide a program on the health effects associated with the use of tobacco products.

**11.2.2.1** The fire department shall provide a smoking/tobacco use cessation program.

**Chapter 12 Critical Incident Stress Program****12.1 General.**

**12.1.1** The fire department physician shall provide medical guidance in the management of the critical incident stress program.

**12.1.2\*** The fire department shall adopt a written policy that establishes a program designed to relieve the stress generated by an incident that could adversely affect the psychological and physical well-being of fire department members.

**12.1.3** The policy shall establish criteria for implementation of the program.

**12.1.4** The program shall be made available to members for incidents including but not limited to mass casualties, large life loss incidents, fatalities involving children, fatalities or injuries involving fire department members, and any other situations that affect the psychological and physical well-being of fire department members.

**Annex A Explanatory Material**

*Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.*

**A.1.2.3** It is possible that an existing program or policy can satisfy the requirements of this standard; if so, it can be adopted in whole or in part in order to comply with this standard. Examples of such existing programs and policies can be a mandatory SCBA rule, seat belt rule, corporate safety program, or municipal employee assistance program. The achievement of these objectives is intended to help prevent accidents, injuries, and exposures and to reduce the severity of those accidents, injuries, and exposures that do occur. They will also help to prevent exposure to hazardous materials and contagious diseases and to reduce the probability of occupational fatalities, illnesses, and disabilities affecting fire service personnel.

**A.1.3.1** The specific determination of the authority having jurisdiction depends on the mechanism under which this standard is adopted and enforced. Where the standard is adopted voluntarily by a particular fire department for its own use, the authority having jurisdiction should be the fire chief or the political entity that is responsible for the operation of the fire department. Where the standard is legally adopted and enforced by a body having regulatory authority over a fire department, such as the federal, state, or local government or a political subdivision, this body is responsible for making those determinations as the authority having jurisdiction. The plan should take into account the services the fire department is required to provide, the financial resources available to the fire department, the availability of personnel, the availability of trainers, and such other factors as will affect the fire department's ability to achieve compliance.

**A.1.4.1** In no case should the equivalency afford less competency of members or safety to members than that which, in the judgment of the authority having jurisdiction, would be provided by compliance with meeting the requirements of Chapter 5.

**A.1.5.1** For a fire department to evaluate its compliance with this standard, it must develop some type of logical process. The worksheet in Annex B (Figure B.1) illustrates one way that an action plan can be developed to determine code compliance.

This standard is intended to be implemented in a logical sequence, based upon a balanced evaluation of economic as well as public safety and personnel safety factors. The compliance schedule request assures that risk is objectively assessed and reasonable priorities set toward reaching compliance. Interim compensatory measures are intended to assure that safety action is being



addressed until full compliance is reached and formally adopted into the fire department organization's policies and procedures. This can include, but is not limited to, increased inspections, testing, temporary suspension or restriction of use of specific equipment, specialized training, and administrative controls.

**A.3.2.1 Approved.** The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

**A.3.2.2 Authority Having Jurisdiction (AHJ).** The phrase "authority having jurisdiction," or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

**A.3.3.3 Aircraft Rescue and Fire Fighting.** Such rescue and fire-fighting actions are performed both inside and outside of the aircraft.

**A.3.3.4 Air Transfer.** Air is allowed to flow from the cylinder with a higher pressure to the cylinder with a lower pressure until the pressure equalizes, at which time the transfer line is disconnected between the two cylinders.

**A.3.3.5.1 Hazardous Atmosphere.** A hazardous atmosphere can be immediately dangerous to life and health.

**A.3.3.8 Candidate.** In an employment context, the Americans with Disabilities Act (discussed in further detail in Annex B of NFPA 1582) requires that any medical examination to be conducted take place after an offer of employment is made and prior to the commencement of duties. Therefore, in the employment context, the definition of *candidate* should be applied so as to be consistent with that requirement. Volunteer fire fighters have been deemed to be "employees" in some states or jurisdictions. Volunteer fire departments should seek legal counsel as to their legal responsibilities in these matters.

**A.3.3.10 Clear Text.** Ten codes or agency-specific codes should not be used when using clear text.

**A.3.3.13 Company.** For fire suppression, jurisdictions exist where the response capability of the initial arriving company is configured with the response of two apparatus. In some jurisdictions, apparatus is not configured with seated and belted positions for four personnel and therefore would respond with an additional vehicle in consort with the initial arriving engine to carry additional personnel. This response would be to ensure that a minimum of four personnel are assigned to and deployed as a company. The intent of this definition and the requirements in the standard are to ensure that these two (or more) pieces of apparatus would always be dispatched and respond together as a single company. Some examples of this include the following:

- (1) Engine and tanker/tender that would be responding outside a municipal water district
- (2) Multiple-piece company assignment, specified in a fire department's response standard operating procedures, such as an engine company response with a pumper and a hose wagon
- (3) Engine with a vehicle personnel carrier
- (4) Engine with an ambulance or rescue unit

*Company*, as used in this standard, is synonymous with company unit, response team, crew, and response group, rather than a synonym for a fire department.

**A.3.3.14 Confined Space.** Additionally, a confined space is further defined as having one or more of the following characteristics:

- (1) The area contains or has a potential to contain a hazardous atmosphere, including an oxygen-deficient atmosphere.
- (2) The area contains a material with a potential to engulf a member.
- (3) The area has an internal configuration such that a member could be trapped by inwardly converging walls or a floor that slopes downward and tapers to a small cross section.

- (4) The area contains any other recognized serious hazard.

**A.3.3.20.1 Communicable Disease.** Also known as contagious disease.

**A.3.3.28 Fire Department.** The term *fire department* should include any public, governmental, private, industrial, or military organization engaging in this type of activity.

**A.3.3.28.1 Industrial Fire Department.** The vast majority of industrial fire brigades are not industrial fire departments. Industrial fire departments are those few brigades that resemble and function as municipal fire departments. These are generally found only at large industrial facilities and at industrial facilities that also perform municipal fire fighting, usually where the plant is located far from municipalities with organized fire departments. Industrial fire departments are organized and equipped for interior structural fire fighting similar to municipal fire departments. Their apparatus is similar to that used by municipal fire departments.

Industrial fire brigades that provide rescue services are industrial fire departments. Industrial facilities can have separate organizations, covered by separate organizational statements, operating as industrial fire brigades and operating as rescue teams providing rescue not related to fire incidents. Membership in these two organizations can overlap.

**A.3.3.29 Fire Department Facility.** This does not include locations where a fire department can be summoned to perform emergency operations or other duties, unless such premises are normally under the control of the fire department.

**A.3.3.31.1 Proximity Fire Fighting.** Specialized thermal protection from exposure to high levels of radiant heat, as well as thermal protection from conductive and convective heat, is necessary for persons involved in such operations due to the scope of these operations and the close distance to the fire at which these operations are conducted, although direct entry into flame is *not* made. These operations usually are exterior operations but could be combined with interior operations. Proximity fire fighting is not structural fire fighting but could be combined with structural fire-fighting operations.

**A.3.3.33 Fire Suppression.** Fire suppression includes all activities performed at the scene of a fire incident or training exercise that expose fire department members to the dangers of heat, flame, smoke, and other products of combustion, explosion, or structural collapse.

**A.3.3.34 Hazard.** Hazards include the characteristics of facilities, equipment systems, property, hardware, or other objects and the actions and inactions of people that create such hazards.

**A.3.3.40 Health and Safety Officer.** This individual can be the incident safety officer or that can also be a separate function.

**A.3.3.46 Incident Management System (IMS).** The system is also referred to as an incident command system (ICS).

**A.3.3.49 Infection Control Program.** This program includes, but is not limited to, implementation of written policies and standard operating procedures regarding exposure follow-up measures, immunizations, members' health screening programs, and educational programs.

**A.3.3.53 Member.** A fire department member can be a full-time or part-time employee or a paid or unpaid volunteer, can occupy any position or rank within the fire department, and can engage in emergency operations.

**A.3.3.59.1 Defensive Operations.** Defensive operations are generally performed from the exterior of structures and are based on a determination that the risk to personnel exceeds the potential benefits of offensive actions.

**A.3.3.59.5 Special Operations.** Special operations include water rescue, extrication, hazardous materials, confined space entry, high-angle rescue, aircraft rescue and fire fighting, and other operations requiring specialized training.

**A.3.3.63 Protective Ensemble.** The elements of the protective ensemble are coats, trousers, coveralls, helmets, gloves, footwear, and interface components.

**A.3.3.66 Rapid Intervention Crew/Company (RIC).** Emergency services personnel respond to many incidents that present a high risk to personnel safety. Departments in compliance with OSHA 29 CFR 1910.134, *Respiratory protection*, must have a minimum of two persons on-scene fully equipped when members are operating in an IDLH or potentially IDLH atmosphere. The primary purpose is the rescue of injured, lost, or trapped fire fighters. Departments utilizing an incident management system in accordance with NFPA 1561 or 29 CFR 1910.120, *Hazardous waste operations and emergency response*, along with a personnel accountability system have incorporated the RIC into their management system. Many departments have redefined their response plans to include the dispatch of an additional company (engine, rescue, or truck) to respond to incidents and stand by as the RIC. Incident commanders can assign additional RICs based on the size and complexity of the incident scene. In some departments they can also be known as a rapid intervention team. At wildland incidents this would be addressed through the

planning process and contingency planning.

**A.3.3.70 Respiratory Protection Equipment (RPE).** Examples are filter respirators, chemical cartridge or canister respirators, air-line respirators, powered air-purifying respirators, and self-contained breathing apparatus.

**A.4.1.1** The organizational statement is a very important basis for many of the provisions of this standard. The statement sets forth the legal basis for operating a fire department, the organizational structure of the fire department, number of members, training requirements, expected functions, and authorities and responsibilities of various members or defined positions.

A key point is to clearly set out the specific services the fire department is authorized and expected to perform. Most fire departments are responsible to a governing body. The governing body has the right and should assert its authority to set the specific services and the limits of the services the fire department will provide and has the responsibility to furnish the necessary resources for delivery of the designated services. The fire department should provide its governing body with a specific description of each service with options or alternatives and with an accurate analysis of the costs and resources needed for each service.

Such services could include structural fire fighting, wildland fire fighting, airport/aircraft fire fighting, emergency medical services, hazardous materials response, high-angle rescue, heavy rescue, and others.

Spelling out the specific parameters of services to be provided allows the fire department to plan, staff, equip, train, and deploy members to perform these duties. It also gives the governing body an accounting of the costs of services and allows it to select those services they can afford to provide. Likewise, the governing body should identify services it cannot afford to provide and cannot authorize the fire department to deliver or it should assign those services to another agency.

The fire department should be no different from any other government agency that has the parameters of its authority and services clearly defined by the governing body.

Legal counsel should be used to assure that any statutory services and responsibilities are being met.

The majority of public fire departments are established under the charter provisions of their governing body or through the adoption of statutes. These acts define the legal basis for operating a fire department, the mission of the organization, the duties that are authorized and expected to be performed, and the authority and responsibilities that are assigned to certain individuals to direct the operations of the fire department.

The documents that officially establish the fire department as an identifiable organization are necessary to determine specific responsibilities and to determine the parties responsible for compliance with the provisions of this standard.

In many cases, these documents could be a part of state laws, a municipal charter, or an annual budget. In such cases, it would be appropriate to make these existing documents part of the organizational statement, if applicable.

In cases other than governmentally operated public fire departments, there is a need to formally establish the existence of the organization through the adoption of a charter, the approval of a constitution or articles of incorporation, or some equivalent official action of an authorized body. A fire department that operates entirely within the private sector, such as an industrial fire department, could legally establish and operate a fire protection organization by the adoption of a corporate policy as described in the organizational statement.

In addition to specifically defining the organization that is expected to comply with this standard, 4.1.1 requires that the organizational structure, membership, expected functions, and training requirements be contained in documents that are accessible for examination. These requirements are intended to reinforce the fact that the fire department is an identifiable organization that operates with known and specific expectations.

Where a fire department functions as a unit of a larger entity, such as one of several municipal departments or a particular unit of a private corporation, the larger organization is often able to provide some of the same elements that are required to be provided by the fire department. This would satisfy the requirements for the fire department to provide those elements.

**A.4.1.2** Additional information on fire department organization and operations can be found in Section 7 of the NFPA *Fire Protection Handbook*, and Chapter 4 of *Managing Fire and Rescue Services*, published by the International City Management Association.

**A.4.2.1** The risk management plan should consider all fire department operations, the duties and responsibilities of members (uniform and civilian), and policies and procedures. The risk management plan should include goals and objectives to ensure that the risks associated with the daily operations of the fire department are identified and effectively managed.

A primary purpose of the risk management plan is to focus efforts on incidents that might not occur very often (low frequency) but that could have severe consequences associated with them (high risk). The reason for the focus on low frequency/high risk incidents is that since they do not occur on a frequent basis responders might not be as prepared to deal with them, and the outcomes can be harmful or detrimental to fire fighters. Examples of low frequency/high risk events could include high-rise fires, technical rescues, multi-alarm fires, or mass casualty incidents.

For additional guidance on the development of a risk management plan, see NFPA 1250, *Recommended Practice in Emergency Service Organization Risk Management*.

**A.4.2.3** The entire risk management decision making process can be summarized as follows:

- (1) Identify or recognize
- (2) Evaluate
- (3) Establish priorities for action
- (4) Act and control
- (5) Monitor and reevaluate

Discussions about frequency and risk arise in the evaluation phase. What are the real or potential risks in terms of frequency and severity to fire department members? How will the organization develop effective control measures to ensure a safe work environment for all members?

Since no two fire departments are alike, there is no standard scale to measure and evaluate frequency and risk. Some fire departments will have a greater or lesser degree of tolerance for risk than others. The intent of the risk management process is for a fire department to develop a standard level of safety. This standard level of safety defines the parameters of the acceptable degree of risk for which members perform their job functions.

By definition, frequency is how often something does, or might, happen. Risk is a measure of the consequences if an undesirable event occurs. There are many factors that enter into the risk discussion, including cost, time lost from work, loss of use of resources, inability to deliver services, and fewer services available. Each risk will have its own set of factors that will dictate how the fire department will try to determine how severe the consequences might be.

This scale is used to establish the degree of priority. Priority of the risk is in direct relation to inherent risks that have had a harmful effect on the department and its members.

A primary purpose of the risk management plan is to focus efforts on incidents that might not occur very often (low frequency) but that could have severe consequences associated with them (high risk). The reason for the focus on low frequency/high risk incidents is that since they do not occur on a frequent basis responders might not be as prepared to deal with them, and the outcomes can be harmful or detrimental to fire fighters. Examples of low frequency/high risk events could include high rise fires, technical rescues, multi-alarm fires, or mass casualty incidents.

There are two factors that will ensure that a low frequency/high risk event will be successful. The first factor is an aggressive training program. Every day is a training day. With an aggressive training program, this will ensure the successful outcome of an incident. The second factor is rapid prime decision making. Personnel, through training and continuous retraining, have the necessary knowledge, skills, and abilities (KSA) to ensure the successful outcome of a low frequency/high risk incident.

Figure A.4.2.3 illustrates the relationship between frequency and risk, and emphasizes the importance of addressing low frequency/high risk incidents.

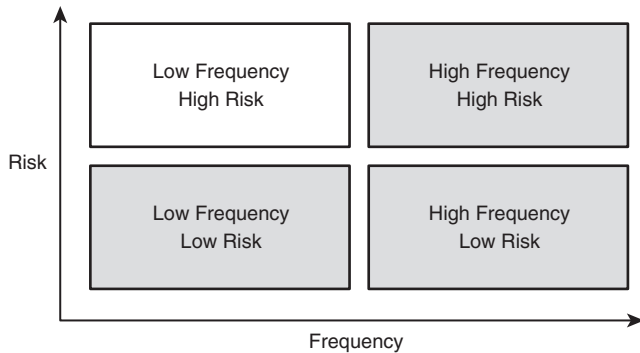


Figure A.4.2.3 Risk and Frequency Graph

**A.4.3.1** The following is an example of a safety policy statement:

It is the policy of the fire department to provide and to operate with the highest possible levels of safety and health for all members. The prevention and reduction of accidents, injuries, and occupational illnesses are goals of the fire department and shall be primary considerations at all times. This concern for safety and health applies to all members of the fire department and to any other persons who could be involved in fire department activities.

**A.4.3.3** Experience has shown that there is often a significant difference between a written occupational safety and health program and the actual program that has been implemented. Periodic evaluations are one method the fire chief can use to measure how the program is being conducted. This evaluation should be conducted by a qualified individual from outside of the fire department, because outside evaluators provide a different perspective, which can be constructive. Outside evaluators could include municipal risk managers, safety directors, consultants, insurance carrier representatives, fire chiefs, safety officers, or others having knowledge of fire department operations and occupational safety and health program implementation.

**A.4.4.3** The responsibility for establishing and enforcing safety rules and regulations rests with the management of the fire department. Enforcement implies that appropriate action, including disciplinary measures if necessary, will be taken to ensure compliance. A standard approach to enforcement should address both sanctions and rewards. All fire department members should recognize and support the need for a standard regulatory approach to safety and health. In addition to the management responsibilities, an effective safety program requires commitment and support from all members and member organizations.

**A.4.4.5** The importance of investigating accidents to personnel, equipment, or vehicles in relation to the prevention of reoccurring accidents is time-proven. However, the occurrence of an accident is, fortunately, relatively rare considering the amount of action carried out by fire service members. Relying solely on accident data to prescribe safety procedures is analogous with closing the birdcage after the bird has escaped.

Compared to the actual number of accidents reported, a host of incidents known as near-misses occur. The philosophy of investigating near-miss incidents deserves merit. There are countless “almost-accidents” that occur every day.

In an effort to truly prevent more accidents, and to effectively manage the safety of the personnel, near-miss incidents should be documented and quantified to truly determine the exposures to risk that people, equipment, and vehicles are exposed to each day. These incident investigations begin with a culture that readily accepts near-miss incident reports without penalty or ridicule. A system should also be in place to investigate the near-miss incident to determine the causal factors involved. Examples can include human error, lack of education or training, lack of familiarity or operation of equipment, or equipment malfunctions or design shortcomings.

Managing the infinite possibilities of near-miss incidents and accidents are laborious and seemingly insurmountable. The investigation into real-world near-misses and accidents begins to humble the task. Attention to the risks measured in the workplace and investigation into the potential incidents and accidents is, arguably, the beginning of an effective safety process.

See also A.4.4.3.

**A.4.5.1** One of the most important provisions for improving the safety and health of the fire service is through an official organizational structure that has the support of the members and the fire department management. Without official recognition and support, safety and health committees could be ineffective showpieces, lack authority, or be dominated by particular interests. To avoid such situations, it is recommended that a safety and health committee be composed of equal numbers of fire department management representatives and member representatives. Specific areas of responsibility of the joint safety and health committee should be outlined in detail through written procedures or contractual negotiation.

**A.4.5.3** The requirement for one regularly scheduled meeting every 6 months is intended as a minimum. Committee meetings should be held as often as necessary to deal with the issues confronting the group. The written minutes of each meeting should be distributed and posted in a conspicuous place in each fire station so that all members can be aware of issues under discussion and actions that have been taken.

**A.4.6.1** The data collection system for accidents, injuries, illnesses, exposures, and deaths should provide both incident-specific information for future reference and information that can be processed in studies of morbidity, mortality, and causation. The use of standard coding as provided by NFPA 901, *Standard Classifications for Incident Reporting and Fire Protection Data*, will allow compatibility with national and regional reporting systems.

**A.4.6.4** See NFPA 1401, *Recommended Practice for Fire Service Training Reports and Records*, for further information and guidance.

**A.5.1.1** The primary goal of all training, education, and professional development programs is the reduction of occupational injuries, illnesses, and fatalities. As members progress through various job duties and responsibilities, the department should ensure the introduction of the necessary knowledge, skills, and abilities to members who are new in their job titles, as well as on-going development of existing skills.

These programs should include information to ensure that members are trained prior to performing individual duties, as well as on-going professional development to ensure competency.

Training programs should include but not be limited to the following:

- (1) Community risk reduction (fire prevention, public education, investigation, etc.)
- (2) Health and safety
- (3) Fire suppression
- (4) Emergency medical
- (5) Human resources (leadership, supervision, interpersonal dynamics, equal employment opportunity, etc.)
- (6) Incident management system
- (7) Hazardous materials
- (8) Technical rescue
- (9) Information systems and computer technology
- (10) Position specific development (firefighter, company officer, chief officer, telecommunicator, investigator, inspector, driver operator, etc.)

**A.5.1.4** The use of a structured on-the-job training (OJT) program with close supervision can assist fire departments to utilize new members in non-IDLH environments during emergency operations.

**A.5.2.2** Statistics presented by the National Fire Protection Association (NFPA) and the United States Fire Administration (USFA) indicate an alarming trend in the increased number of fire fighter fatalities and injuries associated with vehicle operations. Fire departments respond with a variety of apparatus, and the members operating this apparatus must have the appropriate knowledge, skills, and abilities to operate this apparatus.

The first step in this process is to properly train and educate members on the various types of apparatus they could be required to operate. NFPA 1451, *Standard for a Fire Service Vehicle Operations Training Program*, provides the curriculum for members to develop the necessary knowledge, skills, and abilities to meet the requirements of 5.2.2. The second step is to ensure that the fire department performs an annual proficiency evaluation of all driver/operators as required by Section 5.5. Also the training and education should address the standard operating procedures associated with vehicle operations, especially emergency response.

These are necessary components of the department’s plan to reduce the risks associated with vehicle operations. This is a systems approach to ensure for the safety and health of members and the citizens they serve.

**A.5.2.6** In the United States, federal regulations require a minimum amount of training for fire service personnel who respond to hazardous materials incidents. These requirements can be found in 29 CFR 1910.120, *Hazardous waste operations and emergency response*, (OSHA) and in 40 CFR 311, *Worker protection*, (EPA). These regulations affect all fire departments in the United States whether full-time career, part-time, combination career and volunteer, or fully volunteer. These regulations apply in all states and not just in those states with federally approved state OSHA programs.

In the U.S. federal regulations, First Responder Operations Level is defined as follows:

First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposure. First responders at the operational level shall have received at least 8 hr of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed in the awareness level and the employer shall so certify:

- (1) Knowledge of the basic hazard and risk assessment techniques
- (2) Know how to properly select and use proper personal protective equipment provided to the First Responder Operations Level
- (3) An understanding of basic hazardous materials terms
- (4) Know how to perform basic control, confinement, and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit
- (5) Know how to implement basic decontamination procedures
- (6) An understanding of the relevant standard operating procedures and termination procedures

The First Responder Operations Level in both the U.S. federal regulations and NFPA 472 is similar. Whereas the U.S. federal regulations (29 CFR 1910.120 or 40 CFR 311) govern the fire service in every state in the United States, the minimum level of training for all fire fighters must be the First Responder Operations Level.

**A.5.3.1** In order to ensure compliance with the minimum requirements of NFPA 1001, fire department training programs should be certified through a recognized accreditation system. In addition, NFPA 1405, *Guide for Land-Based Fire Fighters Who Respond to Marine Vessel Fires*, provides recommended guidelines for those members who respond to marine vessel fires.

**A.5.3.5** The essence of any successful respiratory protection training program is the establishment of written operational policies and the re-enforcement of those policies through comprehensive training.

The authority having jurisdiction should ensure that each member demonstrates knowledge of at least the following:

- (1) Why respiratory protection equipment is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
- (2) What the limitations and capabilities of the respiratory protection equipment are
- (3) How to use the respiratory protection equipment effectively in emergency situations, including situations in which the respiratory protection equipment malfunctions
- (4) How to inspect, put on and remove, use, and check the seals of the facepiece
- (5) What the procedures are for maintenance and storage of the respiratory protection equipment
- (6) How to recognize medical signs and symptoms that can limit or prevent the effective use of respiratory protection equipment
- (7) The requirements of Section 7.9

**A.5.3.7** Several accidents have occurred where smoke bombs or other smoke-generating devices that produce a toxic atmosphere have been used for training exercises. Where training exercises are intended to simulate emergency conditions, smoke-generating devices that do not create a hazard are required.

**A.5.3.8** Fire departments can utilize instructors who are not necessarily trained and/or certified to the requirements of NFPA 1041, *Standard for Fire Service Instructor Professional Qualifications*. However, in using these instructors they should ensure that they are familiar with the fire department, its organization,

and its operations and, in addition, are qualified in that particular area of expertise.

**A.5.3.9** Members can be trained and/or certified at the local, state, or national level in Basic Life Support (BLS) or Advanced Life Support (ALS). Jurisdictions can require specialty skills within certain levels.

**A.5.3.10** Clothing that is made from 100 percent natural fibers or blends that are principally natural fibers should be selected over other fabrics that have poor thermal stability or ignite easily.

The very fact that persons are fire fighters indicates that all clothing that they wear should be flame resistant (as children's sleepwear is required to be) to give a degree of safety if unanticipated happenings occur that expose the clothing to flame, flash, sparks, or hot substances. This would include clothing worn under their structural fire fighting protective ensemble.

**A.5.5.3** An annual skills check should address the professional qualification specific to a member's assignment and duty expectation. As an example, a fire fighter is checked for skills required by NFPA 1001. A driver/operator would be checked for skills required by NFPA 1002.

**A.6.1.1.1** Information regarding ambulance specifications can be found in the current U.S. Federal Government General Services Administration's Federal Specification for the "Star-of-Life Ambulance," KKK-A-1822E.

**A.6.1.5** The means of holding the item in place or the compartment should be designed to minimize injury to persons in the enclosed area of the fire apparatus or patient compartment of an ambulance. Loose equipment during the event of a crash, a rapid deceleration, or a rapid acceleration can be the cause of serious injury or the crash of the apparatus.

**A.6.2.1** NFPA 1451 can be used to meet the requirements of an "approved driver training program."

**A.6.2.2** When members respond to incidents or to the fire station in their own vehicles, the operation of these vehicles is governed by all applicable traffic laws and codes as enacted by the authority having jurisdiction. The determination of driver's license requirements is a function of a particular authority in each location. This agency can be a state or provincial Department of Transportation or an equivalent agency. Other authorities, such as military branches, have the authority to issue permits to operate their vehicles. It is a responsibility of the fire department to determine the requirements that apply in each situation and for each class of vehicle.

**A.6.2.3.2** For more information, see FA-220, *Firefighter Fatality Retrospective Study*, Federal Emergency Management Agency, United States Fire Administration, April 2002.

**A.6.2.4** The driver of any vehicle has legal responsibility for its safe and prudent operation at all times. While the driver is responsible for the operation of the vehicle, the officer is responsible for the actions of the driver.

**A.6.2.7** The development, implementation, and periodic review of standard operating procedures for driving any fire department vehicle is an important element in clearly identifying the fire department's policy on what is expected of drivers. Safe arrival is of prime importance. Standard operating procedures should include a "challenge and response" dialogue between the vehicle driver on an emergency response and the officer or other member in the driver compartment. The "challenge and response" dialogue should be instituted to determine the driver's intentions when approaching any perceived or identified hazard on the response route, to remind the driver of the presence of the hazard and the planned procedures for managing the hazard, and to ensure that the driver is coping with stressors encountered during the response and not focusing only on arriving at the site of the emergency.

The specific inclusion of railroad grade crossing is based upon recommendations made by the National Transportation Safety Board (NTSB) to NFPA following the 1989 investigation of a collision between a fire department pumper and a passenger train. The NTSB report states that "planning how to safely traverse grade crossing encountered en route is a necessary part of any fire company's response plan."

NTSB recommends that the following be considered when developing the plans:

If it is not practical to plan an emergency response route that avoids grade crossings, selection of crossings that are equipped with automatic warning devices is preferable to selection of those that are not. All planning should include identification of the location at the crossing from which a driver or other observer assigned to the apparatus can see the maximum available distance down the track(s) on both sides.

At crossings over a single straight track with no nearby obstructions, briefly stopping or slowing the apparatus to allow a proper scan both left and right may be sufficient. If the tracks are curved, vision is obstructed, or the crossing has more than one set of tracks where the presence of one train may hide the approach of another, sight distance may be optimized by having one or more members cross the tracks on foot and look for approaching trains.

Fire fighter fatality studies describe 10 incidents that occurred from 1984–2004 in which fire fighters were killed during the backing of fire apparatus. This is a significant issue that the fire service must address in terms of standard operating procedures, training programs, and implementation.

When fire apparatus is in the backing mode, standard operating procedures need to dictate that members assigned to back apparatus be in communications with the driver/operator. This can be accomplished by using the radio system, intercom system, or other means. Standard operating procedures should dictate that the apparatus not be moved until verbal and visual contact is made with the driver/operator and the backer. Also, standard operating procedures must dictate that the backer be in the line of sight with the driver/operator via the apparatus mirrors on either side of the apparatus. The intent is to ensure that the backing of fire apparatus is accomplished in a safe and effective manner.

**A.6.2.7.1** Many incidents require the non-emergency response of fire apparatus. Each fire department must identify incidents that do not require the use of warning lights and sirens. Examples of non-emergency incidents can include lockouts, carbon monoxide detectors sounding, a fire reported out, assist law enforcement, backfills or move-ups, and other incidents as determined by the authority having jurisdiction. The intent is to reduce the risk to fire department members and the citizens of the community from unnecessary harm. The response can always be upgraded to emergency response if the situation warrants based upon additional information.

Fire department water tankers (tenders) provide a mobile water supply to support fire fighting and other fire department operations. They are generally used in rural areas without fire hydrant coverage but can also be found in the fleets of many suburban and urban fire departments.

Although their number as a percent of the overall apparatus fleets is small, estimated at just two percent, they are involved in a disproportionate number of crashes that are fatal to fire fighters and others. A study of fire fighter fatalities from 1990 through 2000 found that fire tankers were the second most common vehicle type involved in crashes that killed fire fighters. Tankers/tenders were second only to personal vehicles in the number of fatal crashes.

The United States Fire Administration produced a report entitled “Safe Operation of Fire Tankers” in 2003. The report (FA-248) is available free from the USFA in print and can be downloaded from the USFA web site at [www.usfa.fema.gov](http://www.usfa.fema.gov). The report provides comprehensive information on the safe construction, use, and operation of fire department tankers/tenders. The report dealt with fire apparatus with water tanks sizes of 1000 gal or more. The recommendations contained in the report, therefore, can apply to any piece of fire apparatus with a large water tank.

Attention to a small number of operational recommendations can make the operation of fire tankers/tenders safer for fire fighters and those that share the road with this type of apparatus.

The following recommendations should become part of standard operating procedures for departments operating tankers (tenders):

(1) Fire fighters should always wear seat belts when driving or as the passenger in any vehicle, including tankers/tenders. The fire fighter’s best chance for survival is to remain with the vehicle during a crash and to be protected by the structure of the vehicle. During the period from 1990 to 2001, 82 percent of the firefighters killed in tanker/tender crashes were not wearing seat belts.

(2) If the right-hand wheels of the apparatus leave the paved surface of the roadway for any reason, the apparatus should be slowed before attempting to return all wheels to the roadway. In 66 percent of the fatal tanker/tender crashes from 1990 to 2001, the right wheels of the apparatus left the roadway. If the vehicle is returned to the roadway surface at speed, the apparatus can veer violently to the left, drivers often overcompensate by steering to the right, and the apparatus either begins to roll or leaves the roadway and crashes. Slowing the vehicle prior to returning to the roadway will minimize the chances of such an event.

(3) *Slow down.* Speed was cited as a factor in 55 percent of fatal crashes of fire department tankers/tenders from 1990 to 2001. The weight of the water and the weight of the apparatus combine to make fire department tankers/tenders very heavy vehicles. They cannot stop quickly, and their handling characteristics are unlike other fire apparatus. The USFA “Safe Operation of Fire Tankers” report recommends that tankers/tenders never be operated over the posted speed limit and that they be controlled to speeds at or less than the cautionary speeds listed on yellow signs on curves.

(4) Make sure that the apparatus is up to the task. Fuel or milk tankers converted to fire department water tankers usually do not have the brake capacity or tank baffles that are needed to transport water — fuel and milk are lighter than water. The total weight of a tanker/tender should not exceed the rated capacity of the vehicle’s braking system. In addition to weight concerns, tankers/tenders must be maintained in a ready state. Their mechanical systems must be checked and maintained on a regular basis.

(5) Ensure that driver/operators have the necessary knowledge, skills, and abilities to specifically drive and operate tankers/tenders. Tankers/tenders do

not operate or have the same driving characteristics as other fire apparatus. Drivers should be specifically trained on each vehicle, and untrained drivers should not be allowed to operate tankers/tenders.

(6) Drive with the tank completely full or completely empty. Even with proper baffling, a semi-full water tank will allow water to move more freely. This water movement can create control problems for the apparatus operator. If the full tank of water is not used, dump the rest of the load in a safe place and drive the tanker/tender empty until the entire tank can be filled.

**A.6.2.8** Accidents at intersections contribute to both civilian and fire fighter deaths and injuries while fire department vehicles are responding to or returning from an emergency incident. Coming to a complete stop when there are any intersection hazards and proceeding only when the driver can do so safely will reduce accidents and the risk of injury or death. It is recommended that intersection control devices be installed that allow emergency vehicles to control traffic lights at intersections.

**A.6.2.10** Vehicle accidents at railroad crossings have resulted in a number of deaths and injuries to fire department members. A National Transportation Safety Board (NTSB) study concluded that a train’s warning horn becomes an ineffective device for warning large vehicles or trucks unless the vehicle driver stops, idles the engine, turns off all radios, fans, wipers, and other noise-producing equipment in the cab, lowers the window, and listens for a train’s horn before entering a grade crossing.

**A.6.3.1** It is intended for the requirements of Section 6.3 to apply to all situations when persons or members are riding on fire apparatus other than for the specific variances in 6.3.4 and 6.3.5. Included in the “seated and belted” requirement are any times the fire apparatus is traveling to, participating in, or returning from any funeral, parade, or public relations/education event. Fire fighters cannot be allowed to ride on the outside of apparatus in order to fight wildland fires. The Fire Line Safety Committee (FLSC) of the National Wildfire Coordinating Group (NWCG) represents the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, Fish and Wildlife Agency, National Park Service, and National Association of State Foresters. Their position is that the practice of fire fighters riding on the outside of vehicles and fighting wildland fires from these positions is very dangerous, and they strongly recommend this not be allowed. One issue is the exposure to personnel in unprotected positions. Persons have been killed while performing this operation. Also, the vehicle driver’s vision is impaired. The second issue is that this is not an effective way to extinguish the fire, as it can allow the vehicle to pass over or by areas not completely extinguished. Fire can then flare up underneath or behind the vehicle and could cut off escape routes. The FLSC and the NWCG strongly recommend that two fire fighters, each with a hose line, walk ahead and aside of the vehicle’s path, both fire fighters on the same side of the vehicle (not one on each side), in clear view of the driver, with the vehicle being driven in uninvolved terrain. This allows the fire fighters to operate in an unhurried manner, with a clear view of fire conditions and the success of the extinguishment. Areas not extinguished should not be bypassed unless follow-up crews are operating behind the lead unit and there is no danger to escape routes or to personnel.

**A.6.3.3** There are instances in which members need to provide emergency medical care while the vehicle is in motion. In some situations, the provision of such medical care would not allow the members to remain seated and secured to the vehicle. Such situations, while they occur infrequently, could include performing chest compressions during cardiopulmonary resuscitation (CPR). If a vehicle accident were to occur while an unsecured member was performing necessary emergency medical care, there would be substantial risk of injury to the member.

**A.6.3.4** The following recommendations will assist the user in implementing 6.3.4:

(1) Hose loading procedures should be specified in a written standard operating procedure that includes at least the safety conditions listed in (2) through (7). All members involved in the hose loading should have been trained in these procedures.

(2) There should be a member, other than those members loading hose, assigned as a safety observer. The safety observer should have an unobstructed view of the hose loading operation and be in visual and voice contact with the apparatus operator.

(3) Non-fire department vehicular traffic should be excluded from the area or should be under the control of authorized traffic control persons.

(4) The fire apparatus can be driven only in a forward direction at a speed of 5 mph (8 kmph) or less.

(5) No members should be allowed to stand on the tailstep, sidesteps, running boards, or any other location on the apparatus while the apparatus is in motion.

(6) Members should be permitted to be in the hose bed but should not stand while the apparatus is in motion.

(7) Prior to the beginning of each hose loading operation, the situation should be evaluated to ensure compliance with all the provisions of the written procedures. If the written procedures cannot be complied with, or if there is any question as to the safety of the operation for the specific situation, then the hose should not be loaded on moving fire apparatus.

**A.6.3.5** The following recommendations will assist the user in meeting the requirements of the standard:

(1) Tiller training procedures should be specified in a written standard operating procedure that includes at least the safety conditions listed in (2) through (6). All members involved in tiller training should have been trained in these procedures.

(2) The aerial apparatus should be equipped with seating positions for both the tiller instructor and the tiller trainee. Both seating positions should be equipped with seat belts for each individual. The tiller instructor should be permitted to take a position alongside the tiller trainee.

(3) The tiller instructor's seat should be permitted to be detachable. Where the instructor's seat is detachable, the detachable seat assembly should be structurally sufficient to support and secure the instructor. The detachable seat assembly should be attached and positioned in a safe manner immediately adjacent to the regular tiller seat. The detachable seat assembly should be equipped with a seat belt or vehicle safety harness. The detachable seat assembly should be attached and used only for training purposes.

(4) Both the tiller instructor and the tiller trainee should be seated and belted.

(5) The instructor and trainee should wear and use both helmet and eye protection if not seated in an enclosed area.

(6) In the event the aerial apparatus is needed for an emergency response during a tiller training session, the training session should be terminated, and all members should be seated and belted in the approved riding positions. There should be only one person at the tiller position. During the emergency response, the apparatus should be operated by a qualified driver/operator.

**A.6.3.6** Helmets should be worn by all members in riding positions in an open cab that does not provide the protection of an enclosed cab. Helmets are also recommended for members riding in enclosed areas where seats are not designed to provide head and neck protection in a collision. Properly designed seats, with head and neck protection, alleviate the need for helmets, and, in some cases, helmets would compromise the safety of the seats.

**A.6.3.7** Eye protection (goggles, safety glasses, or face shields) should be issued to members who might ride in either exposed positions in open cab apparatus or open tiller seats. Department SOPs should outline the safety issues associated with wearing eye protection while driving.

**A.6.3.8** Such alternate means of transportation could include, but not be limited to, other fire apparatus, automobiles, and/or other personnel carriers.

**A.6.4.1** The purpose of this paragraph is to ensure that all vehicles are inspected on a regular basis and checked for the proper operation of all safety features. This inspection should include tires, brakes, warning lights and devices, headlights and clearance lights, windshield wipers, and mirrors. The apparatus should be started, and the operation of pumps and other equipment should be verified. Fluid levels should also be checked regularly.

Where apparatus is in regular daily use, these checks should be performed on a daily basis. Apparatus stored in unattended stations that might not be used for extended periods should be checked weekly. Any time such a vehicle is used, it should be checked before being placed back in service. The 24-hour reference provides for situations in which a vehicle can be used within the period preceding a scheduled inspection, although any deficiencies noted in use should be corrected without delay.

The safety equipment carried on fire department vehicles should be inspected in conjunction with the inspection of the vehicle.

**A.6.4.4** Applicable federal and state regulations, standards, or guidelines should be used as a basis for creating the list to evaluate whether or not a vehicle is safe.

**A.6.5.6** See A.6.4.1.

**A.7.1.1** The provision and use of protective clothing and equipment should include safety shoes, gloves, goggles, safety glasses, and any other items appropriate to the members' activities. This applies to all activities members are expected to perform, including non-emergency activities. The applicable regulations pertaining to industrial worker safety should be consulted to determine the need for protective equipment in non-emergency activities.

**A.7.1.2** The fire department should provide body armor for all members who operate in areas where a potential for violence or civil unrest exists.

**A.7.1.3** Inspection of protective coats and protective trousers should be conducted on a frequent basis by members to ensure the protective clothing's continued suitability for use. The fire department should inspect all protective clothing at least annually. The inspection should confirm the following:

- (1) All materials should be free from tears, embrittlement, and fraying.
- (2) Seams should be intact and show no signs of excessive wear.
- (3) Reflective trim should show no signs of abrasion or loss of reflectivity due to heat exposure.
- (4) All pockets, knee pads, and other accessory items should be firmly attached to the garment and show no signs of excessive wear.
- (5) Sleeve and pant cuffs should show no signs of fraying.
- (6) The entire garment should be free from excessive dirt and stains.
- (7) Where a fabric color change is noted, a condition that could be caused by high heat exposure or ultraviolet exposure, the entire area should be checked for loss of tear strength.

**A.7.1.4** Protective clothing ensembles can be contaminated by bodily fluids or other contaminants encountered while providing medical care, or by smoke, soot, hydrocarbons, asbestos, chemicals, or other substances encountered during fire fighting and other operations.

**A.7.1.5** Station/work uniforms are required to meet the requirements of NFPA 1975. Because it is impossible to ensure that every member — whether a volunteer, call, or off-duty career member — will respond to an incident in a station/work uniform or will change into station/work uniform clothing before donning protective garments, it is very important that members understand the hazards of some fabrics that more easily melt, drip, burn, shrink, or transmit heat rapidly and cause burns to the wearer. Station/work uniforms are required to meet the requirements of NFPA 1975.

Clothing that is made from 100 percent natural fibers or blends that are principally natural fibers should be selected over other fabrics that have poor thermal stability or ignite easily.

The very fact that persons are fire fighters indicates that all clothing that they wear should be flame resistant (as children's sleepwear is required to be) to give a degree of safety if unanticipated happenings occur that expose the clothing to flame, flash, sparks, or hot substances.

**A.7.1.7** Protective clothing ensembles can be contaminated by bodily fluids or other contaminants encountered while providing medical care, or by smoke, soot, hydrocarbons, asbestos, chemicals, or other substances encountered during fire fighting and other operations.

The fire department should establish procedures for cleaning contaminated protective clothing (i.e., turnout gear) and station/work uniforms. This decontamination and cleaning can be done if the proper washers are available.

Commercial washers are available for the fire service that allow the cleaning of fire department contaminated protective clothing and station/work uniforms and non-contaminated items such as bed linens, dish towels, and truck towels.

The proper components of this process include a commercial washer that is front loading, has a stainless steel tub, has a water temperature greater than 130°F (54°C), and has a programmed cycle to decontaminate the tub after the cleaning of contaminated protective clothing and station/work uniforms.

Top-loading residential washers with enamel tubs do not meet the requirements, nor do commercial washers that the public has access to, such as those found in laundromats. If residential washers are going to be utilized for cleaning of station/work uniforms that are contaminated or potentially contaminated, separate washers must be utilized. Residential washers cannot be utilized for cleaning turnout gear. For proper procedures for cleaning protective clothing and station/work uniforms, refer to the manufacturers' instructions, NFPA 1971, and NFPA 1581.

**A.7.2.1** The fire department should consider providing each member with two complete sets of structural fire-fighting protective clothing that meet the requirements of NFPA 1971 whenever possible. It is not reasonable to expect that a fire department would have enough stock protective clothing available to all members in the event that the protective clothing became soiled, wet, or contaminated during daily activities. Fire fighters provided with two complete sets of structural fire-fighting protective clothing can change easily into proper fitting garments and will not be unnecessarily exposed or expose the public to contaminants. Structural protective clothing that is cleaned and properly and completely dried before the next use will last longer and provide greater protection than soiled or damp garments.

**A.7.2.2** Properly fitting protective clothing is important for the safety of the fire fighter. It is important to understand that all protective clothing should be correctly sized to allow for freedom of movement. Protective garments that are too small or too large and protective trouser legs that are too long or too short are safety hazards and should be avoided. Protective coat sleeves

should be of sufficient length and design to protect the coat/glove interface area when reaching overhead or to the side. For proper fitting of a fire fighter, the protective clothing manufacturer should be contacted to provide sizing instructions.

**A.7.3.1** The technical committee's intent is that members utilize the appropriate protective clothing designed specifically for the type of fire-fighting activities for which the member is engaged. The type of fire-fighting activity is based upon the particular fire-fighting techniques used, such as using limited agents or chemicals, rather than the types of fuels involved.

**A.7.4** Fire department personnel involved in emergency medical operations should be protected against potential medical hazards. These hazards include exposure to blood or other body fluids contaminated with infectious agents such as hepatitis and human immunodeficiency viruses. The purpose of emergency medical protective clothing is to shield individuals from these medical hazards and conversely to protect patients from potential hazards from the emergency responder. Emergency medical gloves are to be used for all patient care. Emergency medical garments and face protection devices are to be used for any situation where the potential for contact with blood or other body fluids is high.

NFPA 1999 covers garments, gloves, and face protection devices that are designed to prevent exposure to blood or other body fluids for those individuals engaged in emergency medical patient care and similar operations. NFPA 1999 specifies a series of requirements for each type of protective clothing. Garments can be full body clothing or clothing items such as coveralls, aprons, or sleeve protectors. For the intended areas of body protection, the garment must allow no penetration of virus, offer "liquidtight" integrity, and have limited physical durability and hazard resistance. Gloves must allow no penetration of virus, offer "liquidtight" integrity, and meet other requirements for tear resistance, puncture resistance, heat aging, alcohol resistance, sizing, and dexterity. Face protection devices can be masks, hoods, visors, safety glasses, or goggles. Any combination of items can be used to provide protection to the wearer's face, principally the eyes, nose, and mouth. For the intended areas of face protection, these devices must allow no penetration of virus, offer "liquidtight" integrity, and provide adequate visibility for those portions of the device covering the wearer's eyes.

**A.7.4.2** In order to avoid all potential exposure to infectious diseases, it is important that all members use medical gloves when providing patient care. All members who could come in contact with the patient should use medical gloves.

**A.7.4.3** For additional information refer to 29 CFR 1910.134, *Respiratory protection*; OSHA Enforcement Policy and Procedures for Occupational Exposure to Tuberculosis; and Center for Disease Control and Prevention, "Guidelines for Preventing the Transmission of *Mycobacterium Tuberculosis* in Health-Care Facilities."

**A.7.5** See Annex F, Hazardous Materials PPE Information.

**A.7.5.1** NFPA 1991 covers vapor-protective suits that are designed to provide "gastight" integrity and are intended for response situations where no chemical contact is permissible. This type of suit is equivalent to the clothing required in EPA's Level A. The standard specifies a battery of 17 chemicals, which were selected because they are representative of the classes of chemicals that are encountered during hazardous materials emergencies. Vapor-protective suits should resist permeation by the chemicals present during a response. Permeation occurs when chemical molecules "diffuse" through the material, often without any evidence of chemical attack. Permeation resistance is measured in terms of breakthrough time. An acceptable material is one where the breakthrough time exceeds the expected period of garment use. Chemical permeation resistance for 1 hour or more against each chemical in the NFPA battery is required for primary suit materials (garment, visor, gloves, and boots). To be certified for any additional chemicals or specific chemical mixtures, a suit should meet the same permeation performance requirements.

Other performance requirements are included in NFPA 1991 in order to reflect simulated emergency hazardous materials response use conditions. To determine adequate suit component performance in hazardous chemical environments, the following tests are required by NFPA 1991:

- (1) A suit pressurization test to check the airtight integrity of each protective suit
- (2) An overall suit water penetration test designed to ensure the suit provides full body protection against liquid splashes
- (3) Penetration resistance testing of closures
- (4) Leak and creaking pressure tests for exhaust valves

To ensure that the materials used for vapor-protective suits will afford adequate protection in the environment where they will be used, material testing for burst strength, tear resistance, abrasion resistance, flammability resistance, cold temperature performance, and flexural fatigue are also required.

**A.7.5.1.5** Materials used in vapor-protective suits are tested for limited thermal resistance; however, this testing only prevents the use of inherently flammable materials. There are no performance criteria provided in NFPA 1991 to demonstrate protection of NFPA 1991-compliant vapor-protective suits during fire-fighting operations. There are no test requirements or performance criteria in NFPA 1991 addressing protection from radiological, biological, or cryogenic hazards.

**A.7.5.2** NFPA 1992 covers liquid splash-protective suits, which are designed to protect emergency responders against liquid chemicals in the form of splashes, but not against continuous liquid contact or chemical vapors and gases. Liquid splash-protective suits can be acceptable for some chemicals that do not present vapor hazards. Essentially, this type of clothing meets EPA Level B needs. It is important to note, however, that wearing liquid splash-protective clothing does not protect the wearer from exposure to chemical vapors and gases, since this clothing does not offer gastight performance, even if duct tape is used to seal clothing interfaces. Therefore, where the environment is unknown or not quantified through monitoring, where exposures include carcinogens, where the chemicals have a high vapor pressure, or where the splash-protective suit has not been certified for the chemical exposure, a garment compliant with NFPA 1991 should be utilized.

NFPA 1992 specifies a battery of nine chemicals, including liquid chemicals with low vapor pressures with no known skin absorption toxicity, that are representative of the classes of chemicals likely to be encountered during hazardous materials emergencies. Chemical penetration resistance against the NFPA battery of test chemicals is required. Any additional chemicals or specific chemical mixtures for which the manufacturer is certifying the suit should meet the same penetration performance requirements.

Other NFPA 1992 performance requirements include an overall suit water penetration test to ensure the suit provides full body splash protection. As in NFPA 1991 this standard contains performance criteria to ensure that the materials used for liquid-splash suits afford adequate protection in the environment where they will be used. These test requirements include material testing for burst strength, tear resistance, flammability resistance, abrasion resistance, cold temperature performance, and flexural fatigue testing.

**A.7.5.2.8** Materials used in liquid splash-protective suits are tested for limited thermal resistance; however, this testing only prevents the use of inherently flammable materials. There are no performance criteria provided in NFPA 1992 to demonstrate protection of NFPA 1992-compliant liquid splash-protective suits during fire-fighting operations. There are no test requirements or performance criteria in NFPA 1992 addressing protection from radiological, biological, or cryogenic hazards.

**A.7.5.3.2** Any response plan involving a biological or weapons of mass destruction (WMD) biological hazard should be based on relevant infectious disease or biological safety recommendations by the Centers for Disease Control and Prevention (CDC) and other expert bodies.

For the respiratory protection during these incidents, the respiratory protection program specified in Section 7.9 includes knowledge of hazards, hazard assessment, selection of proper respiratory protective equipment, fit testing, inspection and maintenance of equipment training in its use, assurance of air quality, and medical surveillance. Emergency response teams should be current with the respiratory protection program.

**A.7.7.1** Fire departments that provide wildland and structural fire-fighting services should establish guidelines for members on which ensemble to wear for a given incident.

**A.7.7.3** Structural fire-fighting helmets can be used for this purpose although these are overly heavy and can cause additional stress and fatigue for the member.

**A.7.8.3.1** NIOSH provides nine classes of particulate filters (three classes of filter efficiency — 95 percent, 99 percent, and 99.97 percent, each with three categories of resistance to filter efficiency degradation (N, R, and P). Additionally, performance against toxic industrial gases, vapors, and certain CBRN agents are also specified by NIOSH.

**A.7.8.3.2** Air purifying respirators (APRs and PAPRs) do not supply oxygen. Use should be limited to known contaminants and known exposure levels and used only in adequately ventilated areas. APRs and PAPRs cannot be used when concentrations of contaminants are unknown, or when appropriate exposure limit is not known, or when cartridge or filter service life is unknown.

**A.7.9.1.1** Selection of respiratory protection devices is an important function, particularly where resources are limited and respirators have to be used for different applications with different equipment. USAR, CBRN, confined space, hazardous materials, and other operations can require different filter elements, SCBA breathing air cylinders, umbilical connections, and features that are easier to ascertain and coordinate with a selection stage.

**A.7.9.4** At least one additional reserve SCBA should be available at the incident scene for each 10 SCBA in use to provide for replacement if a failure occurs.

**A.7.9.7** Hazardous atmospheres requiring SCBA can be found in, but are not limited, to the following operations: structural fire fighting, aircraft fire fighting, shipboard fire fighting, confined space rescue, and any incident involving hazardous materials.

**A.7.9.8** The required use of SCBA means that the user should have the facepiece in place, breathing air from the SCBA only. Wearing SCBA without the facepiece in place does not satisfy this requirement and should be permitted only under conditions in which the immediate safety of the atmosphere is assured. All members working in proximity to areas where SCBA use is required should have SCBA on their backs or immediately available for donning. Areas where the atmosphere can rapidly become hazardous could include rooftop areas during ventilation operations and areas where an explosion or container rupture could be anticipated.

A hazardous atmosphere would be suspected in overhaul areas and above the fire floor in a building. Members working in these areas are required to use their SCBA unless the safety of the atmosphere is established by testing and maintained by effective ventilation. With effective ventilation in operation, facepieces could be removed under direct supervision, but SCBA should continue to be worn or immediately available.

**A.7.11.1.2** Manufacturers of fire service SCBA that are NIOSH-certified and that also meet requirements of NFPA 1981 provide SCBA with a reasonable level of dependability, if correctly used and maintained. In those cases where there is a reported failure of SCBA, a before-use check, a more thorough user inspection program, or a preventive maintenance program most likely would have eliminated the failure.

Fire fighters should be thoroughly trained in emergency procedures that can reverse problems encountered with their SCBA. Use of the regulator bypass valve, corrective action for facepiece and breathing tube damage, and breathing directly from the regulator (where applicable) are basic emergency procedures that should be taught to and practiced by the individual user. Fundamental to all emergency procedure training is the principle of not compromising the integrity of the user's SCBA, with particular emphasis on not removing the facepiece for any reason. The danger of compromising the integrity of the SCBA by removing the facepiece in atmospheres where the quality of air is unknown should be reinforced throughout the SCBA training program.

It is natural that this same philosophy be adopted when dealing with the subject of "buddy breathing." The buddy breathing addressed herein is a procedure that requires compromising the rescuer's SCBA by either removal of the facepiece or disconnection of the breathing tube, as these actions place the rescuer in grave danger.

The subject of buddy breathing is always a highly emotional one. Training should stress that fire fighters should not remove the facepiece of the SCBA in a hazardous atmosphere to assist a civilian fire victim, thereby exposing themselves to the toxic atmosphere, but instead rely on the rapid removal of the victim to a safe atmosphere or to a place of refuge where the rescuer can obtain further assistance in removing the victim to fresh air and treatment. However, when a fire fighter becomes the victim due to exhaustion of the breathing air supply or other impairment, some fire departments or fire service personnel insist upon engaging in procedures that are extremely difficult at best, even with consistent training in relatively ideal conditions. Virtually all buddy breathing procedures require compromising the rescuer's SCBA and, for this reason, cannot be condoned. Positive-pressure SCBA has made certain methods of buddy breathing more complicated, if not impossible.

A key disadvantage in buddy breathing is that it is extremely difficult for two people to leave the hazardous atmosphere quickly while engaged in buddy breathing, simultaneously consuming air at a faster rate. The risk that both individuals will inhale sufficient products of combustion to cause impairment or death is a very distinct possibility.

It is difficult to understand why buddy breathing advocates believe that an atmosphere that is deadly for one fire fighter and causes that fire fighter to become a victim can safely be breathed by another fire fighter (the would-be rescuer) while using a buddy breathing procedure.

A scenario involving two fire fighters working at a warehouse fire provides a graphic example of how buddy breathing can be more hazardous than beneficial to both the rescuer and the victim. While working in an interior operation at a warehouse fire, one fire fighter suffered depletion of his breathing air supply. The other fire fighter commenced buddy breathing while both attempted to move out of the building. Unable to make sufficient progress as the first fire fighter was being overcome, the rescuer left the victim and attempted to leave the area for help. But because the rescuer had inhaled sufficient products of combustion during the attempted buddy breathing operation, he collapsed before he could exit the building. He was rescued by other fire fighters and removed to a hospital before he could relate the circumstances regarding the first fire fighter. The first fire fighter was found dead some time later.

If the fire fighter had been trained to remove the victim completely from the building or from immediate physical danger if possible, a number of things

would have been accomplished without endangering the rescuer's life and with less risk to the victim fire fighter. If the rescuer had not compromised his SCBA, he would not have been affected by the products of combustion, he would have retained a greater air supply, and he would have either removed the victim fire fighter by himself or exited the area for additional assistance and alerted medical help.

The risk of both victim and rescuer exhausting their air supplies is another scenario associated with buddy breathing. In this case, what starts out as a rescuer-victim relationship ends up a victim-victim relationship, as the shared air supply is exhausted before exiting is possible.

The one scenario that does not allow exiting is that in which two or more persons are trapped and share air supplies by buddy breathing. In this case, survival is based upon the time it takes those outside to realize that persons are trapped, initiate rescue operations, and accomplish rescue. Unfortunately buddy breathing might only provide a simultaneous ending of multiple lives.

SCBA emergency procedures should be an integral part of any respiratory protection SCBA program, with written policies for the removal of victims, both civilian and fire service, from hazardous atmospheres without compromising the rescuer's respiratory protection SCBA for any reason.

Factors that can limit the need for buddy breathing include the following:

- (1) A strong, well-administered respiratory protection SCBA program
- (2) Emphasis on user testing and inspection of respiratory protection SCBA
- (3) Required before-use and after-use testing and maintenance
- (4) Functional preventive maintenance program
- (5) Fireground management based upon safe operations with knowledge of fire development, building construction, and coordinated fire-fighting operations
- (6) Air management training based upon the type of structure the user is entering, which requires the user to be aware of the distance to exit the structure when the low-air alarm activates or when necessary to leave the structure
- (7) Quality breathing air
- (8) Personal alert safety system (PASS) devices and portable radios for interior fire-fighting teams
- (9) Thorough training in survival techniques, controlled breathing, and stress management
- (10) Accountability for interior fire-fighting crews
- (11) Physical fitness of fire fighters
- (12) Use of positive-pressure SCBA that are NIOSH-approved and that meet the requirements of NFPA 1981

NFPA, ANSI, IAFF, and most SCBA manufacturers do not recommend buddy breathing because it compromises one or more SCBA and can result in the needless impairment or death of either the rescuer or the victim, or both.

**A.7.11.1.3** The use of long-duration SCBA should be restricted to operations in tunnels and underground structures, on board ships, and in other situations where the need for this capability is demonstrated. Weight and stress reduction should be an objective in the acquisition of new SCBA and when upgrading currently used SCBA. Weight and other stress factors are major contributions to fire fighter fatigue and injury, and SCBA should be chosen accordingly.

**A.7.11.3.3** Because of the cumulative hazards associated with the repeated use of filter canisters and cartridges under emergency response conditions, canisters and cartridges that have been placed in service should be removed, replaced, and discarded after training, regardless of exposure time.

**A.7.12.1** Proper respiratory protection programs include provisions for conducting a respirator fit-testing to ensure that the respirator fits the user properly. Air purifying respirators reduce the user's exposure by varying degrees, depending on the type of respirator used and assuming the respirator user has been properly fit tested following procedures set forth in 29 CFR 1910.134 and ANSI Z88.2, *Practices for Respiratory Protection*. An effective face-to-facepiece seal is extremely important when using respiratory protection SCBA. Even a minor leakage can allow contaminants to enter the facepiece, even with positive-pressure respiratory protection SCBA. Any outward leakage will increase the rate of air consumption, reducing the time available for use and safe exit. The facepiece should seal tightly against the skin, without penetration or interference by any protective clothing or other equipment. In those instances where members cannot meet the facepiece seal requirement with equipment currently used by the authority having jurisdiction, individually fitted facepieces should be provided.



Fit testing is a procedure used to evaluate how well a given respirator fits a given person by assessing leakage around the face seal; fit testing can either be qualitative (i.e., relying on a subjective response of the wearer) or quantitative (i.e., using a measurement of actual leakage). The preferred method is to use the quantitative fit testing process due to the accurate measurement of actual leakage, assist with proper sizing of the facepiece, and document results, which are necessary for annual compliance. See also A.7.12.4

Without fit testing, persons unknowingly can have poor face seals, allowing contaminants to leak around the mask and be inhaled. Poor face seals are due to certain facial characteristics (facial size, beards, large sideburns, scars, or other facial uniqueness) that prevent direct contact between the skin and the sealing surface of the respirator and result in leakage or inadequate respiratory protection.

Improper use of a respirator or improper fit testing of any respirator can lead to a false sense of security and possibly result in injury or death to the user.

**A.7.12.4** Although qualitative fit testing is an approved method for fit testing, it does have some drawbacks. It includes the use of chemicals [e.g., smoke (stannic chloride) and saccharin] that have been declared cancer-causing agents. Also, banana oil (isoamyl acetate) requires an exact solution, which must be used only on the day it is mixed, and the facepiece must be connected to an organic vapor filter unit that will filter out the scent used in the fit test procedure. If the test subject does smell the banana oil, then the person must leave the test chamber quickly and go back into the selection room or area. Then the process must begin again with a new facepiece that provides a proper fit. Typically the use of banana oil has a lingering odor that will require a good ventilation system to remove the scent before the next person comes in for the test. All qualitative test methods rest on the ability of the person undergoing the test to say whether they can taste or smell the agent. The fit test operator has to make a judgment as to whether the test person is showing signs of perceiving the agent and what the person says he or she is tasting or smelling. A large degree of human sensory perception and operator judgment is being relied on to make the decision as to whether the respirator provides a good fit or not. The records that are to be kept for each person that is fit tested would indicate that the subject did not smell or taste the challenge atmosphere. There is no numerical value given when qualitative fit testing is done, it is “go” or “no go” for that facepiece. These records are retained until the next annual fit test is performed for each person being tested.

Quantitative fit testing has a number of advantages over qualitative fit testing. The machine provides a numerical value of each test exercise and then a computed fit factor that can be used as a benchmark for future fit testing the following year. The test subject must obtain at least a fit factor of 500 for the person to pass the fit test with the full facepiece. The processing of test subjects can be done much more expeditiously, eliminating down time between re-tests with another facepiece or testing of the next person, as is experienced with the qualitative test method. The strip chart that the test machine provides becomes the written record, and a computer-generated record can be done at the same time. There is little judgment required by the operator of the fit test other than to make sure the test subject and the procedures are followed to the letter.

**A.7.12.6** A protection factor of at least 10,000 in the positive pressure mode is recommended for positive-pressure SCBA. The quantitative test can be used to determine which facepieces fit an individual well and thus aids in selecting the facepiece that best conserves the amount of air in the cylinder.

If a satisfactory fit cannot be achieved for an individual with one make of facepiece, another make of the device should be bought for that member.

**WARNING:** If a facepiece from one manufacturer is used on a unit from another manufacturer, the NIOSH approval will be voided.

**A.7.13.3** The following is the text of 29 CFR 1910.134(g)(1)(i):

“(g) *Use of respirators.* This paragraph requires employers to establish and implement procedures for the proper use of respirators. These requirements include prohibiting conditions that may result in facepiece seal leakage, preventing employees from removing respirators in hazardous environments, taking actions to ensure continued effective respirator operation throughout the work shift, and establishing procedures for the use of respirators in IDLH atmospheres or in interior structural firefighting situations.

(1) *Facepiece seal protection.* (i) The employer shall not permit respirators with tight-fitting facepieces to be worn by employees who have:

(A) Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or

(B) Any condition that interferes with the face-to-facepiece seal or valve function.”

This prohibition applies to any negative or positive-pressure personal respiratory protection device of a design relying on the principle of forming a face seal to perform at maximum effectiveness. A beard growing on the face at points where the seal with the respirator is to occur is a condition that has been shown to prevent a good face seal. This is so regardless of

what fit test measurement can be obtained. If the beard is styled so no hair underlies the points where the SCBA facepiece is designed to seal with the face, then the employer may use the SCBA to protect the employee, however.

**A.7.13.6** The user should be able to demonstrate the successful use of an SCBA with contact lenses in a nonhazardous training environment before being allowed to use them in an incident. Successful long-term soft contact lens use should be measured by the ability to wear soft contact lenses for at least 6 months without any problems.

**A.7.14.1** Given the considerable amount of stored energy inside an SCBA cylinder, cylinders should always be filled using manufacturers’ recommendations and following any existing NIOSH, CGA, or other regulatory agency guidelines.

Because of the failure during refilling of 11 cylinders using aluminum alloy 6351-T6, SCBA cylinders made of this alloy should be diligently inspected, both externally and internally, by properly trained inspectors at least annually.

Most of these failed cylinders had not been maintained properly. Some were being used beyond their DOT-defined hydrostatic test period. Some had not been retrofitted with a special neck-ring that the manufacturer had recommended to reduce the possibility of failure.

For additional information, refer to the United States Department of Transportation (DOT) Research and Special Programs Administration (RSPA) Safety Advisory Notice of 1994 (Federal Register Vol. 59, July 26, 1994), DOT Safety Advisory Notice of 1999 (Federal Register Vol. 64, October 18, 1999), and the NIOSH Respirator User Notice of December 7, 1999.

Several of the ruptured cylinders were made using aluminum alloy 6351-T6. This alloy has been identified as being susceptible to sustained load cracking (SLC) in the neck and shoulder area of the cylinder. The NIOSH Respirator User Notice of December 7, 1999, states: “It is important to note that only a small percentage of cylinders made from aluminum alloy 6351-T6 have actually been found to exhibit sustained load cracking. Moreover, out of several million cylinders manufactured from this alloy by several companies, NIOSH and the U.S. Department of Transportation (DOT) are aware of only 12 ruptures within the United States. Eleven of the 12 ruptures occurred during refilling, six of these 12 ruptures involved SCBA cylinders. Forensic analysis has determined that most of these cylinders failed due to SLC failure. However, in some cases, evidence of other factors such as external mechanical damage was also present.”

Changes have now been made in materials specification and design of cylinders. Since 1988, manufacturers have been using aluminum alloy 6061-T6 in the manufacture of all of their cylinders and cylinder liners. Alloy 6061-T6 has become the “standard of the industry” because it is not susceptible to sustained load cracking.

The failed cylinders belong to a relatively small population of a particular type of cylinder, and there has been no occurrence of cylinder failure during filling of any other type of SCBA cylinders. Full-wrapped composite cylinders, which are predominantly being purchased by the fire service at this time, have been used since 1988 without failure during refilling. There is, therefore, reason to believe that these other types of SCBA cylinders can continue to be used in the fire service without risk of failure during filling.

**A.7.14.5** To facilitate this, it is recommended that industry develop an inexpensive, lightweight chamber, or other means, to provide protection at the fire scene during routine cylinder filling. There is no current commonly accepted standard or specifications for protective enclosures in which to fill SCBA cylinders. Until such a standard is defined, such equipment should comply with the standards defined for fragmentation tanks in NFPA 1901.

A number of SCBA manufacturers have developed systems to quickly fill cylinders. They enable cylinders to be filled while the user is wearing the SCBA. Even though some of these systems have been in use without incident for many years, it is felt that fire fighter and support personnel safety are paramount. This standard therefore recommends that personnel be protected when routinely refilling SCBA cylinders.

Until a commonly accepted standard for providing protection during routine refilling of cylinders is defined, the authority having jurisdiction should determine how best to provide protection for its personnel during routine cylinder filling.

Without a commonly accepted standard defining a concise method of protecting personnel during cylinder refilling, the authority having jurisdiction can choose which method best applies to its personnel. Such protection can consist of refilling cylinders in an enclosure considered acceptable to the authority having jurisdiction. It can consist of using a refill system with a safe record of operation, with no experience of failures or damage to cylinders, supported by sufficient data. Or it can consist of an alternate practice considered as safe by the authority having jurisdiction.

**A.7.14.6** The possibility exists for catastrophic failure of SCBA cylinders during refilling.

**A.7.15.2** Technology has provided the integration of PASS devices with SCBA. When the SCBA unit is activated to an operational mode, the PASS device is activated. The use of PASS devices should be coupled with a solid incident management system, a personnel accountability system, and adequate communications to properly ensure the safety of fire fighters.

**A.7.15.3** The mandatory use and operation of a PASS by fire fighters involved in rescue, fire suppression, or other hazardous duty is imperative for their safety. The primary intent of this device is to serve as an audible device to warn fellow fire fighters in the event a fire fighter becomes incapacitated or needs assistance.

Past fire fighter fatality investigation reports document the critical need to wear and operate PASS devices when fire fighters operate in hazardous areas. Investigation results show that fire fighters most often failed to activate the PASS unit prior to entering a hazardous area. Training and operational procedures are imperative to insure activation of the PASS whenever PASS devices are used.

**A.7.16.3** Life safety rope can be significantly weakened by abrasion, misuse, contamination, wear, and stresses approaching its breaking strength, particularly impact loading. Because there is no approved method to service test a rope without compromising its strength, rope rescue and training operations should be carefully observed and monitored for conditions that could cause immediate failure or result in undetectable damage to the rope. If a rope has been used in a situation that could not be supervised or where potential damage could have occurred, it should be removed from service and destroyed.

It is important that ropes be inspected for signs of wear by qualified individuals after each use. If indications of wear or damage are noted, or if the rope has been stressed in excess of the manufacturers' recommendations or impact loaded, it should be destroyed.

The destruction of the rope means that it should be removed from service and altered in such a manner that it could not be mistakenly used as a life safety rope. This alteration could include disposal or removal of identifying labels and attachments and cutting the rope into short lengths that could be used for utility purposes.

The assignment of disposable life safety ropes to members or to vehicles has proven to be an effective system to manage ropes that are provided for emergency use and are used infrequently. Special rescue teams, which train frequently and use large quantities of rope, should include members who are qualified to manage and evaluate the condition of their ropes and determine the limitations upon their reuse.

**A.7.18.1** The use of personal protective equipment to limit noise exposure should be considered as an interim approach until the noise levels produced by vehicles, warning devices, and radios can be reduced. Protective ear muffs are recommended for fire fighters due to the difficulties of proper fit and insertion of ear plugs. Studies in some jurisdictions have indicated that the most harmful noise exposure can come from radios that are turned up loud enough to be heard over the noise of engines and warning devices. Ear muffs are available that provide effective sound attenuation and rapid donning. They should also be provided with built-in speakers and volume controls for radio and intercom communications. Ear muffs should be worn by operators of noisy equipment (in excess of 90 dBA) at the scene of incidents as well as during response. In some jurisdictions, traffic regulations could limit the use of hearing protection by drivers.

The fire apparatus standards require the noise level at any seated position to be a maximum of 90 dBA when measured as specified in the standard, without any warning devices in operation, as the vehicle proceeds at a speed of 45 mph (72 kmph) on a level, hard, smooth surface road. However, it is recommended that the specification for new fire apparatus provide maximum sound requirements that would allow members to ride in those vehicles without using hearing-protective devices. A maximum limit of 85 dBA without audible warning devices and 90 dBA with warning devices in operation is recommended. Interior noise levels should be measured with the vehicle in motion at the speed that produces the highest noise level, up to 55 mph (80 kmph). All windows should be closed, and the noise level should be measured in each passenger area.

**A.7.18.2** When operating in situations where other protective clothing and equipment is necessary, such as in structural fire fighting, the interface between hearing protection and other necessary protection might not be adequately addressed by currently used devices. For example, ear muffs might not interface with helmets, and foam plastic ear plugs could be dangerous in a fire environment due to the potential for melting. In addition, a reduction in hearing capability in an emergency operations setting could create additional hazards. Effective hearing protection should also be used during non-emergency activities such as equipment checks and engine warm-ups. Attention should be given to correcting the deficiencies through the advent of improved protective devices and through the use of alternate or improved procedures that create less noise.

**A.7.18.3** An effective hearing conservation program should address the regular audiometric testing of members to identify hearing loss, the development and implementation of steps to prevent further hearing loss by members exhibiting such loss, and the ongoing identification and reduction or elimination of potentially harmful noise sources in the work environment. The standards for hearing conservation included in 29 CFR 1910.95, *Occupational noise exposure*, should be used as a basic minimum approach to this problem.

Any approach to hearing conservation should address personal protective devices, audiometric testing, and the reduction of noise exposure that can be achieved by modifying existing equipment or changing procedures. Examples of modifications would include moving siren speakers and air horns down onto front bumpers, responding with windows closed, and installing sound-attenuating insulation in cabs of fire apparatus. The noise produced by audible warning devices should also be evaluated to determine the most effective balance between warning value and harmful characteristics. Some studies indicate that high-low alternating tone sirens and lower pitch air horns could be more effective warning devices and less damaging to hearing.

A long-term approach to hearing conservation should deal with the purchase of apparatus and equipment that is less noisy by design, with noise standards included in the specifications. Improved radio equipment that produces higher clarity of sound with less output volume should also be considered.

For more information on fire department hearing conservation programs, consult the U.S. Fire Administration Publication, *Fire Department Hearing Conservation Program Manual*.

**A.8.1.1** For incidents involving wildland fires, see Annex E for additional safety guidelines.

**A.8.1.5** The incident commander should automatically integrate fire fighter safety and survival into the regular command functions. When this integration occurs, the incident commander promotes fire fighter welfare by performing the standard job of command. Under fire conditions, the incident commander is at an extreme disadvantage to perform any additional tasks. The safety plan for the incident commander has to be the regular command plan.

Due to the high number of fire fighter injuries and deaths attributable to lack of or poor implementation of the safety function on the incident scene, the incident commander should recognize the importance of integrating the safety function into the incident command structure as described in NFPA 1561.

**A.8.1.7** Due to the high number of fire fighter injuries and deaths attributable to lack of or poor implementation of incident management, incident managers should be familiar with the use of incident management teams or incident command team as described in NFPA 1561.

**A.8.1.8** The following explains the responsibilities of the incident commander:

- (1) The incident commander should always integrate fire fighter health and safety considerations into the command process. This integration ensures that safety will always be considered and will not be reserved for unusual or high-risk situations when the incident commander is under a high degree of stress. An incident action plan that addresses fire fighter safety should be a routine function of command.
- (2) Early evaluation enables the incident commander to consider current conditions in a standard manner and then predict the sequence of events that will follow. The consideration of fire fighter safety should be incorporated into this evaluation and forecasting.
- (3) Effective communications are essential to ensure that the incident commander is able to receive and transmit information, obtain reports to maintain an awareness of the situation, and communicate with all component parts of the incident organization to provide effective supervision and controls.
- (4) Strategic decisions establish the basic positioning of resources and the types of functions they will be assigned to perform at the scene of a fire or emergency incident. The level of risk to which members are exposed is driven by the strategy; offensive strategy places members in interior positions where they are likely to have direct contact with the fire, while defensive strategy removes members from interior positions and high-risk activities. The attack plan is based on the overall strategy and drives the tactical assignments that are given to individual or groups of companies/crews and the specific functions they are expected to perform. Risk identification, evaluation, and management concepts should be incorporated into each stage of the command process.
- (5) Tactical-level management component people are command agents and are able to both monitor companies/crews at the actual location where the work is being done (geographic) and to provide the necessary support (functional). The incident commander uses a tactical-level management unit as off-site (from the command post) operational/communications/safety managers-supervisors. The incident commander uses the incident organization along with communications to stay connected. Some incident management systems identify tactical-level management components such as a *division* or a *group* for a functional position within the system, whereas other systems use the term *sectors* for either geographical or functional areas. As incidents

escalate, the incident management system should be utilized to maintain an effective span of control ratio of not greater than 1 to 7 with an optimum ratio of 1 to 5.

(6) The incident commander should routinely evaluate and re-evaluate conditions and reports of progress or lack of progress in reaching objectives. This process will allow the incident commander to determine if the strategy and attack plans should be continued or revised. The failure to revise an inappropriate or outdated attack plan is likely to result in an elevated risk of death or injury to fire fighters.

(7) Effective command and control should be maintained from the beginning to the end of operations, particularly if command is transferred. Any lapse in the continuity of command and the transfer of information increases the risk to fire fighters.

**A.8.2.2** The intent of the use of “clear text” for radio communications is to reduce confusion at incidents, particularly where multiple agencies are operating at the same incident.

**A.8.2.3** Examples of emergency conditions could be: “fire fighter down,” “fire fighter missing,” “fire fighter trapped,” “officer needs assistance,” “evacuate the building/area,” “wind shift from the north to south,” “change from offensive to defensive operations,” “fire fighter trapped on the first floor.”

The term *mayday* should not be used for fireground communications in that it could cause confusion with the term used for aeronautical and nautical emergencies.

In addition to the “emergency traffic,” the fire department can use additional signals such as an air horn signal for members to evacuate as part of their standard operating procedures. Some fire departments have developed an evacuation signal that consists of repeated short blasts of apparatus air horns. The sequence of air horn blasts should not exceed 10 seconds in length, followed by a 10-second period of silence, and it is done three times (total air horn evacuation signal including periods of silence lasts 50 seconds). When this evacuation signal is used, the incident commander should designate specific apparatus to sound the evacuation signal using air horns. The apparatus used should not be in close proximity to the command post, if possible, thus reducing the chance of missing any radio messages.

During fire fighter rescue operations, the incident commander should consider implementing the following:

- (1) Requesting additional resources
- (2) Including a medical component
- (3) Utilizing staging for resources
- (4) Committing the RIC team from standby mode to deployment
- (5) Changing from strategic plan to a high priority rescue operation
- (6) Initiating a PAR (personnel accountability report)
- (7) Withdrawing companies from the affected area
- (8) Assigning a rescue officer
- (9) Assigning a safety officer
- (10) Assigning a backup rapid intervention crew/company
- (11) Assigning an advanced life support (ALS) or basic life support (BLS) company
- (12) Requesting additional command level officers
- (13) Requesting specialized equipment
- (14) Ensuring that dispatch is monitoring all radio channels
- (15) Opening appropriate doors to facilitate egress and access
- (16) Requesting additional vertical/horizontal ventilation
- (17) Providing lighting at doorways, especially at points of entry

**A.8.2.4** Some fire departments can also wish to be provided with reports of elapsed time-from-dispatch. This method can be more appropriate for fire departments with long travel times where significant incident progress could have occurred prior to the first unit arrival.

**A.8.2.4.1** Common procedure is for the dispatch center to announce “incident clock is 10 minutes,” “incident clock is 20 minutes,” “incident clock is 30 minutes,” and so forth.

**A.8.3.1** The incident commander has the ultimate responsibility for the safety of all fire department members operating at an incident and for any and all other persons whose safety is affected by fire department operations. Risk management provides a basis for the following:

- (1) Standard evaluation of the situation
- (2) Strategic decision making
- (3) Tactical planning
- (4) Plan evaluation and revision
- (5) Operational command and control

**A.8.3.2** The risk to fire department members is the most important factor considered by the incident commander in determining the strategy that will be employed in each situation. The management of risk levels involves all of the following factors:

- (1) Routine evaluation of risk in all situations
- (2) Well-defined strategic options
- (3) Standard operating procedures
- (4) Effective training
- (5) Full protective clothing ensemble and equipment
- (6) Effective incident management and communications
- (7) Safety procedures and safety officers
- (8) Back-up crews for rapid intervention
- (9) Adequate resources
- (10) Rest and rehabilitation
- (11) Regular evaluation of changing conditions
- (12) Experience based on previous incidents and critiques

When considering risk management, fire departments should consider the following Rules of Engagement:

- (1) What is the survival profile of any victims in the involved compartment?
- (2) We WILL NOT risk our lives at all for a building or lives that are already lost.
- (3) We will risk our lives a LITTLE, in a calculated manner, to save SAVABLE property.
- (4) We will risk our lives a lot, in a calculated manner, to save SAVABLE LIVES.

**A.8.3.3** The acceptable level of risk is directly related to the potential to save lives or property. Where there is no potential to save lives, the risk to fire department members should be evaluated in proportion to the ability to save property of value. When there is no ability to save lives or property, there is no justification to expose fire department members to any avoidable risk, and defensive fire suppression operations are the appropriate strategy.

**A.8.3.5** An incident safety officer should be established at all major incidents and at any high-risk incidents. The incident safety officer should be assigned to operate under the incident commander. Depending on the specific situation, this assignment could require one or more members. If the fire department’s safety officer is not available or doesn’t have the expertise necessary for the incident, the incident commander should assign one or more members that have the expertise to assume this responsibility. All members should be familiar with the basic duties and responsibilities of an incident safety officer.

**A.8.3.7** Atropine auto-injectors are used in the military and have been purchased by many fire departments. Fire departments that have auto-injectors available for their members need to provide training on the use of the auto-injector.

**A.8.4.1** A standard system to account for the identity and assignment of each member could be relatively simple when all members arrive as assigned crews on fire apparatus. The identity of each crew member should at least be recorded in a standard manner on the vehicle, and each company officer is responsible for those members. In fire departments where members arrive in their own vehicles or assemble at the scene, a system is required to record the identity of each member arriving and to organize them into companies or groups with appropriate supervision. This requires a standard system of “reporting in” at the incident and becoming part of the organized system of operations.

**A.8.4.10** The personnel accountability system is a method of maintaining constant awareness of the identities and location of all personnel involved in emergency operations. The personnel accountability system philosophy starts with the incident command system principles of company unity and unity of command. These duties can be fulfilled initially maintaining company accountability by documenting the situation status and resource status on the tactical worksheet. Other methods include command boards, apparatus riding

lists, company personnel boards, and electronic bar-coding systems. These components can be used in conjunction with one another to facilitate the tracking of personnel by both location and function. The components of the personnel accountability system should be modular and expand with the size and complexity of the incident.

At major incidents, this function should be separate from the role of the incident commander. The function of personnel accountability should be assigned to an accountability officer (resource status and situation status) who is responsible for maintaining the status of all assigned resources at an incident. As the incident escalates, this function would be placed under the planning section.

**A.8.4.11** These accountability supervisors should work with the incident commander and tactical-level management component supervisor to assist in the ongoing tracking and accountability of members.

**A.8.5.1.1** The limitation of emergency scene operations to those that can be safely conducted by the number of personnel on the scene is intended to reduce the risk of fire fighter death or injury due to understaffing. While members can be assigned and arrive at the scene of an incident in many different ways, it is strongly recommended that interior fire-fighting operations not be conducted without an adequate number of qualified fire fighters operating in companies under the supervision of company officers.

It is recommended that a minimum acceptable fire company staffing level should be four members responding on or arriving with each engine and each ladder company responding to any type of fire. The minimum acceptable staffing level for companies responding in high-risk areas should be five members responding or arriving with each engine company and six members responding or arriving with each ladder company. These recommendations are based on experience derived from actual fires and in-depth fire simulations and are the result of critical and objective evaluation of fire company effectiveness. These studies indicate significant reductions in performance and safety where crews have fewer members than the above recommendations. Overall, five member crews were found to provide a more coordinated approach for search and rescue and fire suppression tasks.

During actual emergencies, the effectiveness of companies can become critical to the safety and health of fire fighters. Potentially fatal work environments can be created very rapidly in many fire situations. The training and skills of companies can make a difference in the need for additional personnel and in reducing the exposure to safety and health risks to fire fighters where a situation exceeds their capabilities.

**A.8.5.4** For additional information, see 29 CFR 1910.134.

**A.8.5.7** The assembling of four members for the initial fire attack can be accomplished in many ways. The fire department should determine the manner in which they plan to assemble members in their response plan. The four members assembled for initial fire-fighting operations can include an officer, chief officer, or any combination of members arriving separately at the incident.

Members who arrive on the scene of a working structural fire prior to the assembling of four persons can initiate exterior actions in preparation for an interior attack. These can include, but are not limited to, actions such as the establishment of a water supply, the shutting off of utilities, the placement of ladders, the laying of the attack line to the entrance of the structure, or exposure protection.

If members are going to initiate actions that would involve entering a structure because of an imminent life-threatening situation where immediate action can prevent the loss of life or serious injury, and four members are not yet on the scene, the members should carefully evaluate the level of risk that they would be exposed to by taking such action. If it is determined that the situation warrants such action, incoming companies should be notified so that they will be prepared to provide necessary support and backup upon arrival.

**A.8.5.11** The following examples show how a department could deploy a team of four members initially at the scene of a structure fire, regardless of how the team members are assembled:

(1) The team leader and one fire fighter could advance a fire-fighting hoseline into the IDLH atmosphere, and one fire fighter and the pump operator become the standby members.

(2) The team leader could designate the pump operator to be the incident commander. The team leader and one fire fighter enter the IDLH atmosphere, and one fire fighter and pump operator remain outside as the standby members.

(3) Two fire fighters could advance the hoseline in the IDLH atmosphere, and the team leader and pump operator remain outside as standby members.

**A.8.5.18** Studies have shown that the severity of incidents involving ARFF can rapidly escalate to catastrophic proportions. If fire fighting and rescue operations are to be effective, fully assembled ARFF companies should be

on-scene within the time requirements as specified in NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports*. Experience has shown that it is extremely difficult to assemble personnel who are responding from separate locations for individual ARFF companies within these time constraints. It is strongly recommended that the minimum ARFF company staffing level be three on-duty members responding on or with each ARFF vehicle.

It is also recommended that structural fire apparatus responding in support of ARFF operations should be staffed in accordance with A.8.5.1.1. (See also *NFPA 1710*.)

**A.8.5.19** If advanced life support personnel are available, this level of service would be preferred. Basic life support is the minimum acceptable level.

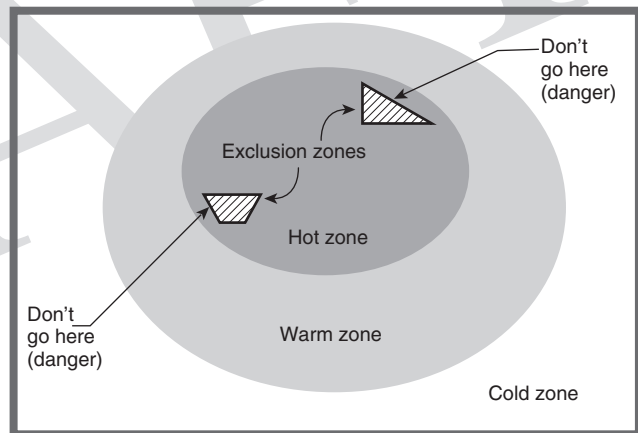
**A.8.5.24** Consideration for rescue of members working over, in, and around water should be addressed by the incident commander and incident safety officer within the incident action plan.

**A.8.6.2** Figure A.8.6.2 shows the concept of control zones. The hot zone is the area presenting the greatest risks to members and will often be classified as an IDLH (immediately dangerous to life and health) atmosphere. The hot zone can include exclusion zones. Examples of exclusion zones could be holes in floors, explosive devices, crime scenes, and so forth.

The warm zone is a limited access area for members directly aiding or in support of operations in the hot zone. Significant risk of human injury (respiratory, exposures, etc.) can still exist in the warm zone.

The cold zone establishes the public exclusion or clean zone. There are minimal risks for human injury and or exposure in this zone.

Wherever possible, control zones should be identified with colored hazard tape, signage, cones, flashing beacons, fences, or other appropriate means. However, because of the nature or location of the incident, available resources, or other considerations, it might not always be possible or practical to mark the control zones.



**Figure A.8.6.2** Example of Control Zones.

**A.8.6.2.2** Members entering the hot zone without an assigned task are placing themselves at greater risk for no reason. In addition they can be increasing the risk of others operating within this zone by creating some confusion.

**A.8.7** For additional information on establishing safe practices at highway incidents, see the IFSTA publication, *Incident Management System Model Procedures Guide for Highway Incidents*, the USFA Publication FA-272, *Emergency Vehicle Safety Initiative*, and the DOT publication, *Manual on Uniform Traffic Control Devices for Streets and Highways*, Chapter 61.

**A.8.7.9** Members that operate on roadway incidents should be provided with vests or garments that ensure proper reflectivity such as a highly retro-reflective vest (strong yellow green and orange).

**A.8.7.10** Proper training on traffic control can be obtained from local or state highway departments, law enforcement, and other agencies involved with the controlling roadway traffic.

**A.8.8.4** The difficulty in rescuing a downed member or member in trouble cannot be overstated. While one crew/company might suffice at a single family dwelling, the act of rescuing a member who is lost, trapped, or missing will become increasingly difficult at a large commercial building or high-rise building.

The ability to rapidly deploy a rapid intervention crew/company from the

command post to an area remote from the location of the command post can adversely affect the successful rescue of a member. Consideration should be given to assigning a RIC to each point of crew entry at a commercial building.

For example, if the incident commander has established a tactical level management component (TLMC) at the front and rear of a commercial building, consideration should be given to assigning a RIC to each TLMC. Likewise, at a working fire in a high-rise building, consideration should be given to assigning multiple RICs to vertical positions near the area(s) of operation. At incidents such as the ones described, it could be desirable for the incident commander to establish a RIC TLMC comprised of multiple companies dependent upon the complexity of the incident.

**A.8.9.1** Having a preplanned rehabilitation program that is applicable to most incident types is essential for the health and safety of members. The rehabilitation plan should outline an ongoing rehabilitation for simple or short-duration incidents as well as a process to transition into the rehabilitation needs of a large or long-duration incident.

**A.8.9.2** See NFPA 1584, *Recommended Practice on Rehabilitation of Members Operating at Incident Scene Operations and Training Exercises*, for guidelines for implementing incident scene rehabilitation.

**A.8.9.3** Rest should be provided away from potentially toxic exposures and loud noises, preferably with the opportunity to dress down and sit down.

Adequate water supplies should allow for up to 1 qt (1 L) per person for incidents lasting an hour or more. Water must be potable, such as sealed individualized plastic bottles. Avoid caffeinated and high-sugar beverages.

In hot humid conditions, and/or where members have been working hard for more than 40 minutes, a means to actively cool core body temperature should be provided to prevent heat stress. Forearm immersion in cool water, misting fans, cooling vests, and so forth are types of active cooling. For more information on active cooling, see “Current Fire Fighter Occupational Medicine Issues, Approaches for Fire Fighter Rehabilitation” by Dr. Tom McLellan.

Medical evaluation and treatment in the on-scene rehabilitation area should be conducted according to EMS protocols developed by the fire department in consultation with the fire department physician and the EMS medical director. If ALS personnel are available, this level of EMS care is preferred.

The assignment of an ambulance or other support crew to the rehabilitation function is essential during long-duration or heavy-exertion incident operations. This crew can assist with rehabilitation functions as well as be available to provide immediate life support needs for members.

Food should be made available for longer duration incidents (more than three hours). If possible, supplied food should be nutritious. Members should be provided with a means to wash contaminants from their hands and faces before refueling.

Weather factors during emergency incidents can impact severely on the safety and health of members, particularly during extremes of heat or cold. Where these factors combine with long-duration incidents or situations that require heavy exertion, the risks to members increase rapidly. The fire department should develop procedures, in consultation with the fire department physician, to provide relief from adverse climatic conditions.

Typical rehabilitation considerations for operations during hot weather extremes are as follows:

- (1) Moving fatigued or unassigned personnel away from the hazardous area of the incident
- (2) Removal of personal protective equipment
- (3) Ensuring that personnel are out of direct sunlight
- (4) Ensuring that there is adequate air movement over personnel, either naturally or mechanically
- (5) Providing for active cooling by using forearm immersion, misting fans, or other devices proven to quickly and effectively lower a members' core body temperature to avoid heat stress
- (6) Providing personnel with fluid replenishment, especially water
- (7) Providing medical evaluation for personnel showing signs or symptoms of heat exhaustion or heat stroke
- (8) Providing a change of clothing and possibly a change of protective garments

Typical rehabilitation considerations for operations during cold weather extremes are as follows:

- (1) Moving fatigued or unassigned personnel away from the hazardous area of the incident

- (2) Providing shelter from wind and temperature extremes
- (3) Providing personnel with fluid replenishment, especially water
- (4) Providing medical evaluation for personnel showing signs or symptoms of frostbite, hypothermia, or other cold-related injury
- (5) Provide a change of clothing and possibly a change of protective garments

**A.8.9.5** The importance of hydration during wildland fire-fighting operations cannot be overemphasized. This concept should be clearly understood and utilized by all members. A method of replenishment of this water supply should be in place to provide 8 qt to 12 qt (8 L to 12 L) of water per day, per member.

**A.8.10.1** Fire department members should not enter an environment where there is on-going violence, or the threat of violence such as persons with weapons, without coordination with law enforcement personnel. This does not necessarily limit the ability of cross-trained fire/law enforcement personnel or specialty trained EMS personnel from entering a violent scene to assist the law enforcement or fire department responders.

**A.8.10.3** Such situations include but are not be limited to civil disturbances, fights, violent crimes, drug-related situations, family disturbances, deranged individuals, and people interfering with fire department operations.

**A.8.10.5** Incidents that appear routine in nature can, after the arrival of responding crews, turn into a violent or hostile environment. A standard communication phrase, known only by communications personnel and other responders, can warn others to the dangers of the situation without triggering violence or hostilities.

**A.9.1.1** Where health, safety, building, and fire codes are not legally applicable to fire department facilities, steps should be taken to ensure that equivalent standards are applied and enforced. In the absence of local requirements, the provisions of NFPA 1, *Fire Prevention Code*; NFPA 101, *Life Safety Code*; NFPA 70, *National Electrical Code*; NFPA 5000, *Building Construction and Safety Code*; the Uniform Plumbing Code; and the Uniform Mechanical Code should be applied. In addition, the workplace safety standards specified in 29 CFR 1910, *Occupational Safety and Health Standards*, or an equivalent standard should be applied. Applicable requirements of the Americans with Disabilities Act should be met.

**A.9.1.4** The intent is to ensure that members assigned to these fire department facilities are protected by carbon monoxide detectors, especially in areas where the members are sleeping. NFPA 720, *Recommended Practice for the Installation of Household Carbon Monoxide Warning Equipment*, can serve as a reference.

**A.9.1.5** As new stations are constructed or existing stations are renovated, a separation between the apparatus floor and living quarters should be provided.

**A.9.1.6** The operation of a fire department requires the storage and indoor operation of fire apparatus that are generally housed in an enclosed building. The need to keep the apparatus and other vehicles ready for immediate service and in good operating condition, which requires the indoor running of vehicles for response and routine service/pump checks, makes storage in an enclosed area, such as an apparatus bay, necessary. The exhaust from all internal combustion engines, including diesel and gasoline-powered engines, contains over 100 individual hazardous chemical components that, when combined, can result in as many as 10,000 chemical compounds. A large majority of these compounds are today listed by state and federal regulatory agencies as being cancer causing or suspected carcinogens. The target components listed by NIOSH/OSHA consist of both hydrocarbon carbon components and compounds, which are produced as both gas-phase and particulate-phase compounds. The gases and particulates, which are viewed by NIOSH and OSHA as life threatening, consist of a cancer-causing substance known as polynuclear aromatic hydrocarbons (PAHs). Gases in diesel exhaust, such as nitrous oxide, nitrogen dioxide, formaldehyde, benzene, sulfur dioxide, hydrogen sulfide, carbon dioxide, and carbon monoxide, can also create health problems. According to NIOSH, human and animal studies show that diesel exhaust should be treated as a human carcinogen (cancer-causing substance). In accordance with the NIOSH *Pocket Guide to Chemical Hazards*, as it pertains to diesel exhaust, NIOSH recommends that occupational exposure to carcinogens be limited to the lowest feasible concentration. NIOSH uses OSHA's classification, outlined in 29 CFR 1990.103, *Definitions*, which states in part “Potential occupational carcinogen means any substance, or combination or mixture of substances, which causes an increased incidence of benign and/or malignant neoplasm, or a substantial decrease in the latency period between exposure and onset of neoplasm in humans or in one or more experimental mammalian species as the result of any oral, respiratory or dermal exposure, or any other exposure which results in the induction of tumors at a site other than the site of administration.” This definition also includes any substance that is metabolized into one or more potential occupational carcinogen by mammals.

**A.9.1.9** As part of the fire station inspection program, the areas around the pole hole and the padding at the bottom of the pole should be regularly checked to ensure for the safety of members using the pole.

**A.9.3** In some jurisdictions fire department facilities are maintained by other agencies. In these situations fire departments should develop a process to expedite requests for repairs or modifications to the facility to address safety or health concerns.

**A.10.1.5** If any member, either career or volunteer, reports for duty under the influence of alcohol or drugs, or any other substance that impairs the member's mental or physical capacity, this situation cannot be tolerated.

Evidence of substance abuse could include a combination of various factors such as slurred speech, red eyes, dilated pupils, incoherence, unsteadiness on feet, smell of alcohol or marijuana emanating from the member's body, inability to carry on a rational conversation, increased carelessness, erratic behavior, inability to perform a job, or other unexplained behavioral changes.

The possibility of liability exists if a member who is under the influence of alcohol or drugs is allowed to remain on duty, to operate or drive vehicles or equipment on duty, or to drive a private vehicle from the duty site. A member who is believed to be under the influence of alcohol or drugs cannot be allowed to operate equipment or drive a vehicle, including a private vehicle, until the condition of the member has been determined and verified.

**A.10.2.1** Fire departments should consider use of the recruiting, mentoring, and training process found in the physical performance requirements referenced in the IAFF/IAFC Candidate Physical Ability Test (CPAT).

**A.10.4.1** The health data base for a fire department should include the reports of regular physical evaluations, injury and illness reports, health exposures, and any supporting information that could be useful in tracking, analyzing, or predicting the health effects of various events on individuals or the group. This process should comply with the medical record-keeping requirements of 29 CFR 1910.120.

**A.10.4.3** This information should be managed in a manner that respects the confidentiality of doctor-patient relationships. Electronic data processing is often employed to facilitate management of such a data base.

**A.10.4.4** The fire department should try to obtain autopsy or other medical information for all deceased employees or former employees. This information could be useful in establishing relationships between occupational factors and resulting fatalities at some time in the future. Autopsies for fire fatalities should be conducted and recorded according to a standard protocol.

**A.10.5.1** Where fire department members routinely respond to emergency medical incidents, the fire department should consult with medical professionals and agencies on measures to limit the exposure of members to infectious and contagious diseases. This should include the provision and maintenance of equipment to avoid or limit direct physical contact with patients, when feasible.

**A.10.6.3** A fire department physician should have specific expertise and experience relating to the needs of fire department members and a thorough knowledge of the physical demands involved in emergency operations. If possible, the fire department physician should be a specialist in the field of occupational medicine.

**A.10.6.4** Depending on the size and the needs of a fire department, the fire department physician might or might not be required on a full-time basis. A fire department should have a primary relationship with at least one officially designated physician. This physician can serve as the primary medical contact and, in turn, deal with a number of other physicians and specialists. A large fire department can designate more than one fire department physician or might determine that a relationship with a group practice or multiple provider system is more appropriate to its needs. In any case, the option to consult with a physician who is particularly aware of the medical needs of fire department members and who is available on an immediate basis should exist.

**A.11.1.1** The fire department member assistance program does not have to be financed by the fire department. Many community/county/state mental health agencies provide such services free of charge or at a nominal fee. The fire department need have only the ability to identify when such problems exist and be able to offer confidential referrals to a professional who will provide the counseling. Although member assistance programs differ from one another in various ways according to the particular needs and resources of individual fire departments, member organizations, and members, there are certain components that are found in all quality programs. The following program standards set forth by the Association of Labor-Management Administrators and Consultants on Alcoholism (ALMACA) address these program components and are strongly recommended.

The physical location of the member assistance program should facilitate easy access while ensuring confidentiality. There should be a review of medical and disability benefits to ensure that plans adequately cover appropriate diagnosis and treatment for alcohol, drug, and mental health problems. Where

feasible, coverage should include outpatient and day treatment care. The member assistance program staff should be familiar with the provisions of the medical and disability benefit plans so they can advise clients clearly as to the extent, nature, and cost of the recommended treatment and the reimbursement available.

The member assistance program staff should combine the following two primary qualifications:

- (1) Appropriate managerial and administrative experience
- (2) Skills in identifying problems, interviewing, motivating, referring clients, and, where appropriate, in counseling or related fields (Experience and expertise in dealing with alcohol-related problems is strongly recommended.)

It is important that members and their families are informed about the member assistance program and the services it offers and are continually updated on its existence, availability, and confidentiality. Information about the member assistance program should be made available to all new members and their families. The member assistance program should maintain current information about alcoholism treatment services and other resources. These include Alcoholics Anonymous, Al-Anon, Alateen, and other self-help groups; appropriate health care; community services; and other professionals. Information about referral procedures, costs, and other relevant factors should be available. Professionally trained individuals should be immediately available to assist members involved in traumatic incidents to reduce or deal with the effects of psychological stress. There should be a periodic review of the member assistance program to provide an objective evaluation of operation and performance. There should be an annual review of member assistance program staff performance.

**A.11.1.3** The policy statement should acknowledge that alcoholism is a disease responsive to treatment and rehabilitation, and it should specify the responsibilities of management, member organizations, and members as they relate to the program. The member assistance program should not in any way alter management authority or responsibilities or the prerogatives of a member organization. Participation in the member assistance program should not affect future service or career advancement, nor should participation protect the member from disciplinary action for continued substandard job performance or rule infractions. Sponsorship of the program by management and the member organization is highly desirable.

**A.11.1.4** Adherence to federal regulations on confidentiality of alcohol and other drug abuse records is required of programs receiving federal funds, directly or indirectly.

**A.11.2.1** Health promotion should include, but not be limited to, the following activities: career guidance, family orientation, and educational programs on topics such as weight control, healthy heart, hypertension, stress management, nutrition, preventive medicine, substance abuse, smoking cessation, and retirement planning. For additional guidance in the implementation and management of the stress management component of a member assistance program, consult the U.S. Fire Administration publication, *Stress Management Model Program for Maintaining Firefighter Well-Being*.

**A.11.2.2** The fire department should develop a policy on the use of tobacco products for all members. The fire department should also develop a policy on the acceptance of new members into the fire department with regard to the use of tobacco products.

**A.12.1.2** Fire fighters frequently experience trauma, death, and sorrow. Critical incident stress is a normal reaction experienced by normal people following an event that is abnormal. The emotional trauma can be serious. It can break through a person's defenses suddenly, or slowly and collectively, so that the person can no longer function effectively. Critical incident stress is the inevitable result of trauma experienced by fire service personnel. It cannot be prevented, but it can be relieved. Experiencing emotional aftershocks following a traumatic event is a very normal reaction and should not be perceived as evidence of weakness, mental instability, or other abnormality. Symptoms can appear immediately after the incident, hours later, or sometimes even days or weeks later. The symptoms can last for a few days, weeks, or months. Occasionally a professional counselor could be needed. Knowing the signs and symptoms and how to respond to them after the occurrence of a critical incident can greatly reduce the chance of more severe and long-term stress. Rapid intervention, talking about the situation, and reassuring that these are normal reactions and feelings can help prevent more serious problems later on, such as family and marital problems. To provide this intervention, the fire department should have access to a critical incident debriefing (CID) team. The main objective of the CID team is to lessen the impact of the critical incident, put it into the proper perspective, and help maintain a healthy outlook. The CID team should consist of other fire fighters, support personnel, and mental health professionals specifically trained in stress-related counseling. The team should be well represented by all types of members whether volunteer, call, or career, and by all ranks. All members should have a minimum of a two-day training seminar with continuing education in stress-related training as an ongoing part of the team's regular meetings. (Monthly meetings are recommended for active departments, while quarterly meetings could be sufficient for less

active departments.) Any individual should be able to initiate the debriefing procedure simply by contacting his/her supervisor or officer or the dispatch center. A contact list of the debriefing team members should be available in the dispatch center. Debriefings should be held for incidents that have the potential for having a stressful impact on members. It is important to remember that an event is traumatic when experienced as such. Generally, debriefings should be held at a station within 1 to 3 hours after the incident. Debriefings should encourage brief discussions of the event, which in themselves help to alleviate a good deal of the stress. Debriefings are strictly confidential and are not a critique of the incident. Information should be given on stress reactions and steps that members can take to relieve the symptoms so that they can continue their normal activities as soon as the debriefing is over. Some common signs and symptoms of critical incident stress are fatigue, headaches, inability to concentrate, anxiety, depression, inappropriate emotional behavior, intense anger, irritability, withdrawal from the crew and/or family, change in appetite, increased alcohol consumption, and a change in sleeping patterns. To help alleviate some of the emotional pain, members can rest more, contact friends, maintain as normal a schedule as possible, eat well-balanced and scheduled meals, keep a reasonable level of activity to fight boredom, express feelings, and talk to loved ones. Recent studies and research also indicate that exercise, especially soon after an event, can greatly reduce mental pain. Member assistance programs should always be available to members. The CID team is often the first step in providing the help that is needed and should be ready to serve to help minimize stress-related injury.

### Annex B Fire Service Occupational Safety and Health Program Worksheet

*This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.*

**B.1** The worksheet (see Figure B.1) in this annex was developed by technical committee members to provide a template for fire departments that are beginning an occupational safety and health program or that are evaluating the current status of their programs. (See Figure B.1 on the following page.)

**FIGURE B.1 Fire Service Occupational Safety and Health Program Worksheet. (Existing)**

**B.2** This worksheet provides a tool for assessing the yearly progress of the program and for developing a fiscal policy plan to achieve compliance with the applicable requirements of the standard. In the second, third, or fourth column, the user can record whether his or her department has achieved total compliance, partial compliance, or compliance that was affected by either administrative order or legislative action. If the department has not achieved compliance, the date(s) that compliance is expected to be completed can be recorded in the fifth column. There are some compliance issues that require budgetary action and would be included in either an operating budget or a capital planning budget. When compliance is achieved, this can be recorded in the sixth column. For budget items that are planned for two or three years in the future, those costs and anticipated compliance dates can be included in the seventh and eighth columns. Any remarks or changes should be included in the last column for explanatory purposes. This is not a “one size fits all” worksheet and can be modified to meet the user’s needs.

### Annex C Building Hazard Assessment

*This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.*

**C.1** Fire fighters are being exposed to increased risks on the fireground. Buildings are being occupied in a manner different from that for which they were originally designed. The design of some buildings has changed so that the roofs and floors can and do fail at a faster rate. Mezzanines over the floor area have created hazards during fire-fighting operations. These changes have created safety hazards, which have increased the risks to fire fighters.

Fire departments should take appropriate measures to identify buildings that can cause hazardous conditions during emergency operations. A method that could be used is to add a letter or letters to the bottom white “specific hazard” area on existing NFPA 704, *Standard Systems for the Identification of the Hazards of Materials for Emergency Response*, placards. Some buildings are constructed utilizing several types of roof construction. The local fire department should determine which identifier is used based upon the construction feature or hazard that creates the greatest risk to fire fighters.

The identifier letter or letters that could be used are as follows:

- (1) **A** — Artisans living in a commercial building

- (2) **LT** — Lightweight trusses used in roof or floor construction (e.g., roofs-open web, wooden I-beams)
- (3) **AT** — Arch trusses used in roof construction
- (4) **P** — Panelized roof construction
- (5) **M** — Mezzanines above floor area

Fire departments should initiate local actions that allow for the local adoption of NFPA 704 placards, with the same identifiers to be installed on nonplacarded buildings.

The NFPA 704 marking system could prove beneficial for first responding companies and move-up companies, including companies used during mutual and automatic aid.

It is recommended that fire departments develop tactical plans to address safety concerns for fire fighters confronted with buildings placarded with specific hazards.

### Annex D Risk Management Plan Factors

*This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.*

**D.1** Essentially, a risk management plan serves as documentation that risks have been identified and evaluated and that a reasonable control plan has been implemented and followed.

Some factors to consider for each step of the process are listed in D.1.1 through D.1.5.

**D.1.1 Risk Identification.** For every aspect of the operation of the fire department, list potential problems. The following are examples of sources of information that could be useful in the process:

- (1) A list of the risks to which members are or can be exposed
- (2) Records of previous accidents, illnesses, and injuries, both locally and nationally
- (3) Facility and apparatus surveys, inspections, and so forth

**D.1.2 Risk Evaluation.** Evaluate each item listed in the risk identification process using the following two questions:

- (1) What is the potential frequency of occurrence?
- (2) What is the potential severity and expense of its occurrence?

This will help to set priorities in the control plan.

Some sources of information that could be useful are the following:

- (1) Safety audits and inspection reports
- (2) Prior accident, illness, and injury statistics
- (3) Application of national data to the local circumstances
- (4) Professional judgment in evaluating risks unique to the jurisdiction

**D.1.3 Establishment of Priorities for Action.** Establishing priorities taken in combination with the results of the frequency and severity determinations will help to establish priorities for determining action, recognizing the following:

- (1) Any risk that has a low probability of occurrence but will have serious consequences (high risk) deserves immediate action and would be considered a high priority item.
- (2) Non-serious incidents with a low likelihood of occurrence are a lower priority and can be placed near the bottom of the “action required” list.

**D.1.4 Risk Control.** Once risks are identified and evaluated, a control for each should be implemented and documented. The two primary methods of controlling risk, in order of preference, are as follows:

- (1) Wherever possible, totally eliminate/avoid the risk or the activity that presents the risk. For example, if the risk is falling on the ice, then do not allow members to go outside when icy conditions are present.
- (2) Where it is not possible or practical to avoid or eliminate the risk, steps should be taken to control it. In the example in D.1.4(1), some methods of control would be sand/salt procedures, the wearing of proper footwear, and so forth.

**D.1.5 Other Methods of Control.** Other methods of control to consider are the following:

- (1) Safety program development, implementation, and enforcement
- (2) Standard operating procedures development, dissemination, and enforcement
- (3) Training
- (4) Inspections

**D.1.6 Risk Management Monitoring and Follow-Up.** As with any program, it is important to evaluate whether the plan is working. Periodic evaluations should be made, and, if the program elements are not working satisfactorily, then modifications should be made.

**D.2** Figure D.2 shows a sample risk management plan. For additional information the user should refer to NFPA 1250.

**FIGURE D.2 Sample Risk Management Plan. (Existing C.1 2002 Edition)**

**Annex E Fire Fighter Safety at Wildland Fires**

*This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.*

**E.1** In the wildland fire environment, the following four basic safety hazards confront the fire fighter:

- (1) Lightning
- (2) Fire-weakened timber
- (3) Rolling rocks
- (4) Entrapment by running fires

Each fire fighter must know the interconnection of LCES (lookouts, communications, escape routes, and safety zones). LCES should be established before fighting the fire: select lookouts, set up a communications, choose escape routes, and select safety zones.

LCES functions sequentially — it's a self-triggering mechanism. Lookouts assess — and reassess — the fire environment and communicate threats to safety; fire fighters use escape routes to safety zones. All fire fighters should be alert to changes in the fire environment and have the authority to initiate communication.

LCES is built on the following two guidelines:

- (1) Before safety is threatened, each fire fighter must know the LCES system will be used.
- (2) LCES must be continuously reevaluated as fire conditions change.

The LCES system approach to fireline safety is an outgrowth of an analysis of fatalities and near misses for over 20 year. LCES simply focuses on the essential elements of the standard firefighting orders. Its use should be automatic in fireline operations, and all fire fighters should know the LCES interconnection.

**E.2 Standard Firefighting Orders.** The original 10 Standard Firefighting Orders were developed in 1957 by a task force after reviewing the records of 16 tragedy fires that occurred from 1937 to 1956. The Standard Firefighting Orders were based in part on the successful "General Orders" used by the United States Armed Forces. The Standard Firefighting Orders are organized in a deliberate and sequential way to be implemented systematically and applied to all fire situations.

The 10 Standard Firefighting Orders are as follows:

- (1) Keep informed on fire weather conditions and forecasts.
- (2) Know what your fire is doing at all times.
- (3) Base all actions on current and expected behavior of the fire.
- (4) Identify escape routes and safety zones and make them known.
- (5) Post lookouts when there is possible danger.
- (6) Be alert. Keep calm. Think clearly. Act decisively.
- (7) Maintain prompt communications with your forces, your supervisor, and adjoining forces.
- (8) Give clear instructions and ensure they are understood.
- (9) Maintain control of your forces at all times.
- (10) Fight fire aggressively, having provided for safety first.

**E.3 Watchout Situations.** Shortly after the Standard Firefighting Orders were incorporated into fire fighter training, the 18 situations that shout "watch out" were developed. These 18 situations are more specific and cautionary than the Standard Firefighting Orders and described situations that expand the 10 points of the Standard Firefighting Orders. If fire fighters follow the Standard Firefighting Orders and are alerted to the 18 Watchout Situations, much of the risk of fire fighting can be reduced.

The 18 Watchout Situations are as follows:

- (1) Fire not scouted and sized up
- (2) In country not seen in daylight
- (3) Safety zones and escape routes not identified
- (4) Unfamiliar with weather and local factors influencing fire behavior
- (5) Uninformed on strategy, tactics, and hazards
- (6) Instructions and assignments not clear
- (7) No communication link with crewmembers/supervisors

- (8) Constructing line without safe anchor point
- (9) Building fireline downhill with fire below
- (10) Attempting frontal assault on fire
- (11) Unburned fuel between you and the fire
- (12) Cannot see main fire, not in contact with anyone who can
- (13) On a hillside where rolling material can ignite fuel below
- (14) Weather is getting hotter and drier
- (15) Wind increases and/or changes direction
- (16) Getting frequent spot fires across line
- (17) Terrain and fuels make escape to safety zones difficult
- (18) Taking a nap near the fire line

**E.4 Common Denominators.** Just as there are common denominators relating to fire fighter fatalities involving structural fire fighting, there are common denominators relating to wildland fire fighting operations. It is imperative that personnel involved in wildland fire fighting operations be very familiar with these common denominators relating to fire behavior. These common denominators should be part of any wildland safety training program and continually emphasized.

The four major common denominators of fire behavior in tragedy fires are as follows:

- (1) Most incidents happen on smaller fires or on isolated sections of larger fires
- (2) Flare-ups generally occur in deceptively light fuels, such as grass, herbs, and light brush
- (3) Most fires are innocent in appearance before unexpected shifts in wind direction and/or speed result in flare-ups. In some cases, tragedies occur in the mop-up stage
- (4) Fires respond to large- and small-scale topographic conditions, running uphill surprisingly fast in chimneys, gullies, and on steep slopes

There is considerable information available at <http://www.fs.fed.us/fire/safety/> that can assist a person responsible for fire fighter safety at wildland fire incidents.

**Annex F Hazardous Materials PPE Information**

*This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.*

**F.1** Fire department personnel involved in a hazardous materials incident should be protected against potential chemical hazards. The purpose of chemical-protective clothing and equipment is to shield or isolate individuals from the chemical hazards that can be encountered during hazardous materials responses. Adequate chemical-protective clothing should be carefully selected and used to protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing.

Structural fire-fighting protective clothing and equipment should not be used for hazardous materials incidents. Even where certified to the appropriate NFPA standards for structural fire fighting, these clothing and equipment items provide little or no protection against hazardous materials. Use of this clothing for hazardous materials emergency response can result in serious injury or death for the following reasons.

**F.1.1** Structural fire-fighting protective clothing materials are easily permeated or penetrated by most hazardous materials. Some parts of structural fire-fighting clothing can actually absorb chemical liquids or vapors, increasing the likelihood of serious exposure.

**F.1.2** Many hardware items will fail or lose function when contacted by chemicals (e.g., etching of visors, deterioration of straps, corrosion of hooks or other metal items).

**F.1.3** Contamination of structural fire-fighting protective clothing might not be effectively removed by laundering. Reuse of contaminated clothing can cause chronic exposure and accelerate physiological effects produced by contact with the chemical. Fire fighters should realize that no single combination of protective equipment and clothing is capable of protecting them against all hazards. Therefore, chemical-protective clothing should be used in conjunction with other protective methods. The use of such clothing can create significant wearer hazards, such as heat stress and physical and psychological stress, as well as impaired vision, mobility, and communication. In general, the greater the level of chemical clothing protection, the greater are the associated risks. For any given situation, equipment and clothing should be selected that provide



an adequate level of protection. Overprotection as well as underprotection can be hazardous and should be avoided. The approach to selecting personal protective clothing and equipment should encompass an ensemble of clothing and equipment items that are easily integrated to provide both an appropriate level of protection and the ability to carry out emergency response activities. The following is a checklist of components that can form the chemical-protective ensemble:

- (1) Protective clothing (i.e., suit, coveralls, hoods, gloves, boots)
- (2) Respiratory equipment (i.e., SCBA, combination SCBA/SAR)
- (3) Cooling system (i.e., ice vest, air circulation, water circulation)
- (4) Communications device
- (5) Head protection
- (6) Ear protection
- (7) Inner garments
- (8) Outer protection (i.e., overgloves, overboots, flashcovers)

**F.2 EPA Guidance.** The United States Environmental Protection Agency (EPA) has outlined four levels of protection: A, B, C, and D. The EPA defined these levels of protection primarily for workers at hazardous waste sites, where emergency conditions do not usually exist. These levels of protection are commonly and often inappropriately utilized by the fire service. They are inadequate and do not correctly define the chemical-protective clothing with respect to the intended use based on the hazard and the required performance the selected clothing or equipment must offer.

EPA levels of protection should be used only as the starting point for ensemble creation; however, each ensemble must be tailored to the specific situation in order to provide the most appropriate level of protection. For example, if the emergency response activity involves a highly contaminated area or the potential of contamination is high, it could be advisable to wear a disposable covering such as coveralls or splash suits over the protective ensemble.

It is important to realize that selecting items by their design or configuration alone is not sufficient to ensure adequate protection. In other words, just having the right components to form an ensemble is not enough. Again, the EPA levels of protection do not define what performance the selected clothing or equipment should offer.

**F.3 Emergency Response PPE Information.** For emergency response, the only acceptable types of protective clothing include fully or totally encapsulating suits and nonencapsulating or “splash” suits combined with accessory clothing items such as chemical-resistant gloves and boots. These descriptions apply to how the clothing is designed, not to its performance. The NFPA has classified chemical-protective suits by their performance in the following two standards:

- (1) Vapor-protective suits (NFPA 1991)
- (2) Liquid splash-protective suits (NFPA 1992)

Protective clothing should completely cover both the wearer and the wearer’s breathing apparatus. Wearing SCBA or other respiratory equipment outside the suit subjects this equipment to the chemically contaminated environment. The SCBA used for hazardous materials emergency response are generally the same as those used in structural fire fighting. Respiratory protective equipment is not designed to resist chemical contamination and should be protected from these environments. NFPA 1991 vapor-protective suits require that respiratory protection SCBA be worn on the inside. NFPA 1992 liquid splash-protective suits can be configured with the SCBA on either the inside or the outside. However, it is strongly recommended that respiratory equipment be worn inside the ensemble to prevent its failure and to reduce decontamination problems.

A variety of accessories are available for chemical-protective ensembles. As with protective clothing and respirators, it is important that these components integrate easily into an ensemble without a decrease in the protective integrity offered by any one component. For the most part, the protective suit is the main integrating ensemble component because it should accommodate all other equipment while completely covering the wearer. Nevertheless, selection of an ensemble configuration should consider all items simultaneously.

Fire departments are faced with selecting a number of available chemical-protective garments and sorting through the variety of information provided by the manufacturer. What follows are some guidelines that can be used in selecting chemical-protective suits.

**F.3.1** It must be determined if the clothing item is intended to provide vapor or liquid splash protection. Vapor-protective suits also provide liquid splash protection. Both vapor and liquid splash-protective suits also provide protection against solid chemicals and particles. Many garments can be labeled as totally encapsulating but do not provide gastight integrity due to inadequate seams or closures. Splash suits must still cover the entire body when combined with the respirator, gloves, and boots. Applying duct tape to a splash suit does not

enable it to protect against vapors. Gastight integrity can only be determined by performing a pressure or inflation test of the respective protective suit. ASTM F 1052, *Standard Test Method for Pressure Testing Vapor Protective Ensembles*, offers a procedure for conducting this test. This test involves the following:

- (1) Closing off suit exhalation valves
- (2) Inflating the suit to a prespecified pressure
- (3) Observing whether the suit holds the above pressure for a designated period of time

Liquid splash-protective suits should provide “liquidtight” integrity. Liquidtight integrity is best evaluated by determining how the chemical-protective suit and other clothing prevent sprayed liquid from contacting the wearer. ASTM F 1359, *Standard Test Method for Liquid Penetration Resistance of Protective Clothing or Protective Ensembles Under a Shower Spray While on a Mannequin*, offers procedures for conducting this test involving the placement of the suit and other clothing over a mannequin that is dressed in a water-absorptive garment. Surfactant-treated water is sprayed at the suited mannequin from several different directions. Observations of water penetration on the water-absorptive garment indicate a lack of liquidtight integrity. In particular, seam, closure, and clothing item interface areas should be examined closely for watertight integrity.

**F.3.2** It should be determined if the clothing item provides full-body protection. A vapor-protective or totally encapsulating suit will meet this requirement by passing gastight integrity tests. Liquid splash-protective suits can have separate parts. Missing clothing items should be obtained separately and match or exceed the performance of the garment. Buying a polyvinyl chloride (PVC) glove for a PVC splash suit does not mean that the same level of protection is obtained. This determination should be made by comparing chemical resistance data.

Component parts of the liquid splash-protective suit should also integrate and provide liquidtight integrity as described previously.

**F.3.3** The manufacturer’s chemical resistance data provided with the garment should be evaluated. Technical data packages are required to be supplied by the manufacturers of protective suits that are certified to NFPA 1991 or NFPA 1992. Manufacturers of vapor-protective suits should provide permeation resistance data for their products, while penetration resistance data should accompany liquid splash-protective garments. Data should be provided for every primary material in the suit, including the garment, visor, gloves, and boots.

Permeation data should include a citation that testing was conducted in accordance with ASTM F 739, *Standard Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids or Gases Under Conditions of Continuous Contact*, and the following:

- (1) Chemical name
- (2) Breakthrough time (indicates how soon the chemical permeates)
- (3) Permeation rate (indicates the rate at which the chemical permeates)
- (4) System sensitivity (allows comparison of test results from different laboratories)

If no data is provided or if the data lacks any of the information above, the manufacturer should be asked to supply the missing data or the product will not be considered. Manufacturers that provide only numerical or qualitative ratings should support their recommendations with complete test data.

Penetration data should include a pass or fail determination for each chemical listed and a citation that testing was conducted in accordance with ASTM F 903, *Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Liquids*. Protective suits that are certified to NFPA 1991 or NFPA 1992 should meet all of the above requirements.

Suit materials that show no breakthrough or no penetration in response to a large number of chemicals are likely to have a broad range of chemical resistance. (Breakthrough times greater than 1 hour are usually considered to be an indication of acceptable performance.) If there are specific chemicals within a response area that have not been tested, the manufacturer should be consulted for test data on these chemicals.

**F.3.4** The manufacturers’ instruction manual should be obtained and examined.

This manual should document all the features of the suit and describe those materials that are used in its construction. It should cite specific limitations for the suit and the restrictions that apply to its use. Procedures and recommendations should be supplied for at least the following:

- (1) Donning and doffing
- (2) Inspection, maintenance, and storage

- (3) Decontamination
- (4) Use

The manufacturers' instructions should be thorough enough to allow trained fire department members to wear and use the suit without a large number of questions.

**F.3.5** Sample garments should be obtained and inspected.

An examination of the quality of suit construction and other features that will impact its wearing should be made. If possible, representative garments should be obtained in advance, inspected prior to purchase, and reviewed with an individual who has experience in their use. It is also helpful to "try out" representative garments prior to purchase by having personnel run through exercises to simulate response activities while wearing the garments.

Despite the fact that a fire department has gone through a very careful selection process, a number of situations will arise where no information is available to judge whether the protective clothing chosen will provide adequate protection. These situations include the following:

- (1) Chemicals that have not been tested with the garment materials
- (2) Mixtures of two or more different chemicals
- (3) Chemicals that cannot be readily identified
- (4) Lack of data in all suit components (e.g., gloves, visors)

Testing material specimens using newly developed field test kits can offer one means for making on-site clothing selections. A portable test kit has been developed by the EPA using a simple weight loss method that allows field qualification of protective clothing materials within 1 hour. Use of this kit can compensate for the absence of data and provide additional criteria for clothing selection. Selection of chemical-protective clothing is a complex task and should be performed by personnel with both extensive training and experience. Under all conditions, clothing should be selected by evaluating its performance characteristics against the requirements and limitations imposed by the response activity.

### Annex G Sample Facility Inspector Checklists

*This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.*

**G.1** Figure G.1 is a facilities safety checklist used by the Virginia Beach Fire Department to document and record fire department facility inspections. Fire departments are encouraged to develop an inspection form and procedure that works for their jurisdiction. The inspection procedure should provide direction for company officers to conduct inspections of their particular facilities at least annually as required by this standard. (See Figure G.1 Sample Facilities Safety Checklist on the following pages.)

### Annex H Referenced Publications

**H.1** The following documents or portions thereof are referenced within this standard for informational purposes only and are thus not part of the requirements of this document unless also listed in Chapter 2.

**H.1.1 NFPA Publications.** National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1, *Fire Prevention Code*, 2006 edition.

NFPA 70, *National Electrical Code*<sup>®</sup>, 2005 edition.

NFPA 101<sup>®</sup>, *Life Safety Code*<sup>®</sup>, 2006 edition.

NFPA 403, *Standard for Aircraft Rescue and Fire-Fighting Services at Airports*, 2003 edition.

NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents*, 2002 edition.

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, 2001 edition.

NFPA 720, *Recommended Practice for the Installation of Household Carbon Monoxide Warning Equipment*, 2003 edition.

NFPA 901, *Standard Classifications for Incident Reporting and Fire Protection Data*, 2001 edition.

NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, 2002 edition.

NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*, 2003 edition.

NFPA 1041, *Standard for Fire Service Instructor Professional Qualifications*, 2002 edition.

NFPA 1250, *Recommended Practice in Emergency Service Organization Risk Management*, 2004 edition.

NFPA 1401, *Recommended Practice for Fire Service Training Reports and Records*, 2001 edition.

NFPA 1404, *Standard for Fire Service Respiratory Protection Training*, 2002 edition.

NFPA 1405, *Guide for Land-Based Fire Fighters Who Respond to Marine Vessel Fires*, 2001 edition.

NFPA 1451, *Standard for a Fire Service Vehicle Operations Training Program*, 2002 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System*, 2005 edition.

NFPA 1581, *Standard on Fire Department Infection Control Program*, 2005 edition.

NFPA 1582, *Standard on Comprehensive Occupational Medical Program for Fire Departments*, 2003 edition.

NFPA 1584, *Recommended Practice on the Rehabilitation of Members Operating at Incident Scene Operations and Training Exercises*, 2003 Edition.

NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2004 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2003 edition.

NFPA 1971, *Standard on Protective Ensemble for Structural Fire Fighting*, 2000 edition.

NFPA 1975, *Standard on Station/Work Uniforms for Fire and Emergency Services*, 2004 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service*, 2002 edition.

NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies*, 2000 edition.

NFPA 1992, *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies*, 2000 edition.

NFPA 1999, *Standard on Protective Clothing for Emergency Medical Operations*, 2003 edition.

NFPA 5000, *Building Construction and Safety Code*, 2003.

NFPA *Fire Protection Handbook*, 19<sup>th</sup> edition, 2003.

#### H.1.2 Other Publications.

**H.1.2.1 ANSI Publication.** American National Standards Institute, Inc., 11 West 42nd Street, 13th floor, New York, NY 10036.

ANSI Z88.2, *Standard for Respiratory Protection*, 1992.

**H.1.2.2 ASTM Publications.** American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM F 739, *Standard Test Method for Resistance of Protective Clothing Materials to Permeation by Liquids or Gases Under Conditions of Continuous Contact*, 1999.

ASTM F 903, *Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Liquids*, 2004.

ASTM F 1052, *Standard Test Method for Pressure Testing Vapor Protective Ensembles*, 2002.

ASTM F 1359, *Standard Test Method for Liquid Penetration Resistance of Protective Clothing or Protective Ensembles Under a Shower Spray While on a Mannequin*, 2004.

**H.1.2.3 IAPMO Publications.** International Association of Plumbing and Mechanical Officials, 20001 Walnut Drive South, Walnut, CA 91789.

*Uniform Mechanical Code*, 2003.

*Uniform Plumbing Code*, 2003.

**H.1.2.4 ICMA Publication.** International City Management Association, 777 N. Capitol Street NE, Washington, DC 20002.

*Managing Fire and Rescue Services*, 2002.

### VIRGINIA BEACH FIRE DEPARTMENT FACILITY SAFETY CHECKLIST

Facility: \_\_\_\_\_ Date: \_\_\_\_\_

**I. GENERAL**

- \_\_\_\_\_ The required VOSH workplace poster shall be displayed in the station, as required, where all employees are likely to see it.
- \_\_\_\_\_ Emergency instructions and telephone numbers shall be available for the general public, in the event of an emergency and fire personnel are out of quarters.

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- \_\_\_\_\_ Cooking appliances, including gas and charcoal grills, and eating utensils should be kept clean and in good working order.

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**II. HOUSEKEEPING**

- \_\_\_\_\_ All rooms, offices, hallways, storage rooms, and the apparatus floor shall be kept clean and orderly and in a sanitary condition.
- \_\_\_\_\_ All hallways and/or passageways shall be free from any type of hazards.
- \_\_\_\_\_ All waste containers shall be emptied regularly.
- \_\_\_\_\_ Waste containers shall be provided in the kitchen and/or eating areas. These containers shall be maintained in a clean and sanitary condition. Waste container liners are required in all waste containers kept in kitchen and/or eating areas.
- \_\_\_\_\_ All areas of the station shall be adequately illuminated.
- \_\_\_\_\_ Stairways shall be in good condition with standard railings provided for every flight having four or more risers.
- \_\_\_\_\_ Portable ladders shall be adequate for their purpose, in good condition, and have secure footing.
- \_\_\_\_\_ Fixed ladders shall be equipped with side rails, cages, or special climbing devices.
- \_\_\_\_\_ Containers of all cleaning agents shall be carefully labeled per the 1910.1200 standard of VOSH standards.
- \_\_\_\_\_ First Aid supplies shall be available and clearly identified as to location.
- \_\_\_\_\_ Shower curtains should provide adequate protection to prevent floors from becoming excessively wet and slippery.

**III. EXITS**

- \_\_\_\_\_ All exits shall be visible and unobstructed.
- \_\_\_\_\_ All exits shall be marked with a readily visible sign which is illuminated if required by building code.
- \_\_\_\_\_ Doors which might be mistaken for exits shall be marked "Not an Exit" if required by building code.
- \_\_\_\_\_ Exits and exit signs shall be free of decoration, draperies, and/or furnishings.
- \_\_\_\_\_ Primary exit routes shall be obvious, marked, and free of obstruction.
- \_\_\_\_\_ Exits should be wide enough for easy access.

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**IV. WALKING AND WORKING SURFACES**

- \_\_\_\_\_ Floors shall be kept clean and dry as possible.
- \_\_\_\_\_ Fire fighters' routes to slide poles or to apparatus shall be completely free of projections, tripping hazards, loose objects, or other impediments.
- \_\_\_\_\_ All slide pole floor openings shall be provided with safety enclosures.
- \_\_\_\_\_ A safety mat shall be provided at the bottom of the slide pole.
- \_\_\_\_\_ The slide pole shall be regularly inspected and maintained.

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Figure G.1 Sample Facilities Safety Checklist

**V. APPARATUS FLOOR AND MAINTENANCE AREAS**

- \_\_\_ All projecting tools and objects shall be clearly marked to warn against "head bump" accidents.
- \_\_\_ Apparatus overhead doors shall be maintained in a safe, operating condition.
- \_\_\_ Apparatus doors shall have adequate space for proper clearance for vehicles.
- \_\_\_ Maintenance pits shall be adequately covered, sufficiently lighted, and ventilated.
- \_\_\_ Pit boundaries shall be clearly marked.
- \_\_\_ The pit floor shall be kept clean and dry as possible.
- \_\_\_ Work rests on grinders shall be adjusted to within 1/8 in. to the grinding wheel.
- \_\_\_ Grinders and grinding wheels shall be adequately guarded. The safety guard shall cover the spindle end, nut, and the flange protection.
- \_\_\_ All power tools shall be provided with proper guarding for electrical, cutting, and moving parts.
- \_\_\_ Maintenance hand tools shall be safely stored when not being used. They shall be inspected periodically and maintained to assure their safe condition.

Unsafe conditions to check:

- \_\_\_ Is the tool clean?
- \_\_\_ Are handles/grips broken?
- \_\_\_ Are there worn defective points/parts on the tool?
- \_\_\_ Are there parts missing?
- \_\_\_ Are safety guards and devices in place and in proper working condition?
- \_\_\_ Pulleys and belts shall be properly guarded.
- \_\_\_ Chain drives and sprockets shall be guarded.
- \_\_\_ Air cleaning nozzles shall not emit more than 30 psi dead end pressure.
- \_\_\_ A spotter shall be used when vehicles are backed up. A spotter shall be used when a vehicle is driven forward or backward over a pit.

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**VI. LAUNDRY, CLEANING, AND DISINFECTING AREAS**

- \_\_\_ The station designated cleaning and disinfecting area for the care of linen, work uniforms, EMS equipment, and other portable equipment shall be clean and orderly.
- \_\_\_ The designated cleaning and disinfecting area shall be physically separate from the areas used for food preparation, cleaning of food or cooking utensils, personal hygiene, and sleeping or living areas.
- \_\_\_ Cleaning and disinfecting facilities shall be equipped with rack shelving of nonporous material located above the sink for drip drying of cleaned equipment.
- \_\_\_ The utility sink used in the cleaning and disinfecting area shall be kept clean and free of obstruction, and objects should not be left in the sink.
- \_\_\_ The washer and dryer shall be kept clean and in good working condition to assure decontamination of work uniforms and linen.
- \_\_\_ A five gallon Biohazard waste container shall be maintained at each station. The container shall be emptied routinely according to SOP.

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**VII. BUILDING EXTERIOR AND GROUNDS**

- \_\_\_ The exterior of the building shall be in good condition. There should be no missing finishes or temporary repairs. Roof shingles should not be missing and all windows should function.
- \_\_\_ There should be no accumulation of debris or trash next to the building or on the station grounds.
- \_\_\_ All walkways surfaces, parking lots, and ramps shall be free of hazards and in good condition.
- \_\_\_ All exterior lighting shall work as designed.
- \_\_\_ All detached storage buildings shall be kept in good condition and present no obvious hazards.

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Figure G.1 Sample Facilities Safety Checklist (Continued)

**VIII. DECON ROOMS**

- \_\_\_\_\_ The Decon room shall be clean and orderly and free of storage not related to decontamination.
- \_\_\_\_\_ The Decon room shall have instructions clearly posted as to how to proceed through decontamination.
- \_\_\_\_\_ There shall be an inventory on hand in the decon room and the inventory shall be complete with the supplies on hand.
- \_\_\_\_\_ The decon washer and dryer shall be clean and in working condition.
- \_\_\_\_\_ There shall be instructions posted as to the use of the washer and dryer.

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**IX. FIRE PREVENTION AND PROTECTION**

- \_\_\_\_\_ Portable fire extinguishers shall be maintained in a fully operable condition and kept in designated places when not in use. They shall be inspected on a monthly basis.
- \_\_\_\_\_ Fire extinguishers shall be of the proper size/type for the expected hazard.
- \_\_\_\_\_ The fire extinguisher shall have a durable tag securely attached to show the maintenance or recharge date. Also, the initials or signature of the person who performed the inspection shall be on the tag.
- \_\_\_\_\_ The fire alarm system shall be tested on a quarterly basis, if the station is so equipped.
- \_\_\_\_\_ If the station is so equipped, the sprinkler system shall be serviced by a qualified person.
- \_\_\_\_\_ The minimum amount of clearance, 18 in., shall be maintained below the sprinkler heads.
- \_\_\_\_\_ Smoke detectors, which are in stations not equipped with fire alarm systems, shall be tested quarterly.
- \_\_\_\_\_ CO detectors shall be inspected/tested quarterly.

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**X. HAZARDOUS MATERIALS**

- \_\_\_\_\_ Cylinders of compressed gas shall be stored away from combustible materials, in an upright position and properly secured to prevent cylinders from falling over.
- \_\_\_\_\_ Flammable and combustible materials shall be stored in tanks or closed containers per NFPA 30 and building code requirements. Flammable and combustible liquids in excess of 30 gal must be stored in an approved storage locker. The containers must be made of metal, or the containers must be stored in an approved flammable storage cabinet.
- \_\_\_\_\_ Safety containers shall have self closing lids and shall be used for the storage of flammable liquids and soiled, oily rags.

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**XI. ELECTRICAL WIRING, FIXTURES, AND CONTROLS**

- \_\_\_\_\_ Electrical cords shall be strung so they do not hang on pipes, nails, hooks, etc.
- \_\_\_\_\_ Conduit shall be attached to all supports and tightly connected to junction and outlet boxes.
- \_\_\_\_\_ All electrical cords shall be checked for fraying.
- \_\_\_\_\_ All equipment shall be securely mounted to the surface on which it sits.
- \_\_\_\_\_ Flexible cords and cables shall not be used as a substitute for fixed wiring.
- \_\_\_\_\_ All extension cords shall be properly grounded and approved.
- \_\_\_\_\_ All electrical tools, whether department owned or personal property, shall be properly protected for damaged power cords, plugs, worn switches, defective ground circuits, or other faults which may render them unsafe for use.
- \_\_\_\_\_ Electrical panel boxes and circuit breakers shall be marked to show their purpose.
- \_\_\_\_\_ Electrical switches, outlets, panel boxes, and junction boxes, will be properly covered.

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Figure G.1 Sample Facilities Safety Checklist (Continued)

**H.1.2.5 NWCG (National Wildfire Coordinating Group) Publication.** National Interagency Fire Center Publications, Great Basin Cache Supply Office, 3833 So. Development Avenue, Boise, ID 83705.

NWCG-NFES No. 1077, Incident Response Pocket Guide, January 2004.

**H.1.2.6 USFA Publications.** U.S. Fire Administration, 16825 S. Seaton Avenue, Emmitsburg, MD 21727.

*Fire Department Hearing Conservation Program Manual*, 1991.

*Stress Management Model Program for Maintaining Firefighter Well-Being*, 1990.

**H.1.2.7 U.S. Government Publications.** U.S. Government Printing Office, Washington, DC 20402.

Americans with Disabilities Act, 1992.

Center for Disease Control and Prevention, “Guidelines for Preventing the Transmission of *Mycobacterium Tuberculosis* in Health-Care Facilities,” 1994, October, 1994.

FA-220, *Firefighter Fatality Retrospective Study*, Federal Emergency Management Agency, United States Fire Administration, April 2002.

Federal Register, Vol. 59, 38028, July 26, 1994.

Federal Register, Vol. 60, No. 110, June 8, 1995.

Federal Register, Vol. 64, 56243, October 18, 1999.

General Services Administration, Federal Specification for the “Star-of-Life Ambulance,” KKK-A-1822E, June 1, 2002

NIOSH *Pocket Guide to Chemical Hazards*, U.S. Department of Health and Human Services, Public Health Services, Publication DHHS No. 85-114, September 1985.

NIOSH Respirator User Notice of December 7, 1999.

OSHA Enforcement Policy and Procedures for Occupational Exposure to Tuberculosis, October 8, 1993.

Title 29, Code of Federal Regulations, Part 1910, *Occupational Safety and Health Standards*.

Title 29, Code of Federal Regulations, Part 1910.95, *Occupational noise exposure*, 1996.

Title 29, Code of Federal Regulations, Part 1910.120, *Hazardous waste operations and emergency response*, 2002.

Title 29, Code of Federal Regulations, Part 1910.134, *Respiratory protection*, 1998.

Title 29, Code of Federal Regulations, Part 1990.103, *Definitions*, 2004.

Title 40, Code of Federal Regulations, Part 311, *Worker protection*, June 1989.

U.S. Department of Labor, Occupational Safety and Health Administration, Memorandum for Regional Administration and State Designees, “Response to IDLH or Potential IDLH Atmospheres,” May 1, 1995.

#### **H.1.2.8 Other Publications.**

Dr. Tom McLellan, Defence Research and Development Canada, “Current Fire Fighter Occupational Medicine Issues, Approaches for Fire Fighter Rehabilitation,” September 2003, IAFF John P. Redmond Foundation Health and Safety Seminar, San Francisco.

**H.2 Informational References.** The following documents or portions thereof are listed here as informational resources only. They are not a part of the requirements of this document.

John LeCuyer, *Designing the Fitness Program: A Guide for Public Safety Organizations*, PennWell Corporation, Saddle Brook, NJ, 2001.

**H.3 References for Extracts.** The following documents are listed here to provide reference information, including title and edition, for extracts given throughout this standard as indicated by a reference in brackets [ ] following a section or paragraph. These documents are not a part of the requirements of this document unless also listed in Chapter 2 for other reasons.

NFPA 472, *Standard for Professional Competence of Responders to Hazardous Materials Incidents*, 2002 edition.

NFPA 1250, *Recommended Practice in Emergency Service Organization Risk Management*, 2004 edition.

NFPA 1404, *Standard for Fire Service Respiratory Protection Training*, 2002 edition.

NFPA 1451, *Standard for a Fire Service Vehicle Operations Training Program*, 2002 edition.

NFPA 1561, *Standard on Emergency Services Incident Management System*, 2005 edition.

NFPA 1670, *Standard on Operations and Training for Technical Rescue Incidents*, 2004 edition.

NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2004 edition.

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2003 edition.

NFPA 1977, *Standard on Protective Clothing and Equipment for Wildland Fire Fighting*, 2005 edition.

NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service*, 2002 edition.

NFPA 1982, *Standard on Personal Alert Safety Systems (PASS)*, 1998 edition.

NFPA 1999, *Standard on Protective Clothing for Emergency Medical Operations*, 2003 edition.