NFPA 1500

Standard on

Fire Department Occupational Safety and Health Program

2007 Edition

This edition of NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, was prepared by the Technical Committee on Fire Service Occupational Safety and Health and acted on by NFPA at its June Association Technical Meeting held June 4–8, 2006, in Orlando, FL. It was issued by the Standards Council on July 28, 2006, with an effective date of August 17, 2006, and supersedes all previous editions.

A tentative interim amendment (TIA) to Section 7.15 and its Annex A paragraphs was issued on July 28, 2006. For further information on tentative interim amendments see Section 5 of the NFPA Regulations Governing Committee Projects available at:

http://www.nfpa.org/assets/files/PDF/CodesStandards/TIAErrataFI/TIARegs.pdf

This edition of NFPA 1500 was approved as an American National Standard on August 17, 2006.

Origin and Development of NFPA 1500

This is the fifth edition of NFPA 1500. The first edition was published in 1987 as there was no consensus standard for an occupational safety and health program for the fire service. Fire service organizations were being increasingly subject to regulations that were developed for general industry and that did not provide for many of the specific needs and concerns of an organization involved in the delivery of emergency services. The direct line-of-duty deaths were being documented and reported, but there was also a growing concern with the number of fire fighters who were suffering disabling injuries or developing occupational diseases that often had debilitating or fatal consequences. Following the first edition, revised editions were published in 1992, 1997, and 2002.

The technical committee, working from data provided from NFPA's Data Analysis and Research Division and NIOSH Fire Fighter Investigation reports, has carefully reviewed the entire document including the associated annex material, and updated many areas to reflect current best practices. Requirements were reorganized in some areas to make the document more user friendly.

Among the changes made were revising the section on risk management and adding additional explanation in the annex. A new section on appointment of a health and safety officer was added, and sections that duplicated the responsibilities of the health and safety officer in NFPA 1521 were removed.

Chapter 5 was reorganized and revised to reflect not only the need of members to have skill and knowledge in performing their day-to-day tasks but also the need for ongoing professional development.

In Chapter 6, requirements and annex material were added to support improved vehicle response operations with an emphasis on safe arrival at the scene.

Requirements for providing and using protective ensembles appropriate for technical rescue operations and chemical and biological terrorism incidents that went into the 2002 edition as a TIA were updated and incorporated, as were other requirements for personal protective ensembles.

New sections on traffic incidents, establishing control zones, and fitness for duty evaluations were added.

Fire fighting and the delivery of other emergency services continues to be a hazardous job. However, the poor medical condition or physical fitness of some members, as well as problems with vehicle operator training and operation, use of an incident management system, and communication capability continue to further erode the safe delivery of emergency services. This edition of the standard continues to emphasize a holistic approach to health and safety in the fire service.

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

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

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.

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

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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, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex H. Editorial changes to extracted material consist of revising references to an appropriate division in this document or the inclusion of the document number with the division number when the reference is to the original document. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

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 organizations providing rescue, fire suppression, emergency medical services, hazardous materials mitigation, special operations, and other emergency services, including public, military, private, and industrial fire departments.

1.3.2 This standard shall not apply to industrial fire brigades that might also be known as emergency brigades, emergency response teams, fire teams, plant emergency organizations, or mine emergency response teams.

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,* 2007 edition.

NFPA *101®*, *Life Safety Code®,* 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 for 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,* 2006 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems,* 2007 edition.

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

NFPA 1404, *Standard for Fire Service Respiratory Protection Training,* 2006 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,* 2007 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,* 2006 edition.

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

NFPA 1912, *Standard for Fire Apparatus Refurbishing,* 2006 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 Tools,* 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 Ensembles for Structural Fire Fighting and Proximity Fire Fighting,* 2007 edition.

NFPA 1975, *Standard on Station/Work Uniforms for Fire and Emergency Services,* 2004 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 Fire and Emergency Services,* 2002 edition.

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

NFPA 1983, *Standard on Life Safety Rope and Equipment for Emergency Services,* 2006 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,* 2005 edition.

NFPA 1992, *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies,* 2005 edition.

NFPA 1994, *Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents,* 2007 edition.

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

2.3 Other Publications.

2.3.1 ACGIH Publications.

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

TLVs® and BEIs®, 2005.

2.3.2 ANSI Publications.

American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036.

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

2.3.3 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 42, Code of Federal Regulations, Part 84, Approval of respiratory protective devices, 2004.

2.3.4 Other Publications.

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

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

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

NFPA 600, *Standard on Industrial Fire Brigades,* 2005 edition.

NFPA 1250, *Recommended Practice in Emergency Service Organization Risk Management,* 2004 edition.

NFPA 1404, *Standard for Fire Service Respiratory Protection Training,* 2006 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 Search and 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 Fire and Emergency Services,* 2002 edition.

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

NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies,* 2005 edition.

NFPA 1994, *Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents,* 2007 edition.

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).** An organization, office, or individual responsible for enforcing the requirements of a code or standard, or 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). See 3.3.61.1.

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* **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.

3.3.4* **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.

3.3.5 Atmosphere.

3.3.5.1* **Hazardous Atmosphere.** Any atmosphere that is oxygen deficient or that contains a toxic or disease-producing contaminant. [**1404,** 2006]

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). See 3.3.61.2.

3.3.7 Biological Terrorism Agents. Liquid or particulate agents that can consist of biologically derived toxin or pathogen to inflict lethal or incapacitating casualties. [**1994,** 2007]

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

3.3.9 CBRN. An abbreviation for chemicals, biological agents, and radiological particulate hazards.

3.3.10* Chemical Flash Fire. The ignition of a flammable and ignitible vapor or gas that produces an outward expanding flame front as those vapors or gases burn. This burning and expanding flame front, a fireball, will release both thermal and kinetic energy to the environment. [**1991,** 2005]

3.3.11 Chemical Terrorism Agents. Liquid, solid, gaseous, and vapor chemical warfare agents and toxic industrial chemicals used to inflict lethal or incapacitating casualties, generally on a civilian population as a result of a terrorist attack. [**1994,** 2007]

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

3.3.13 Closed-Circuit SCBA. See 3.3.87.1.

3.3.14 Cold Zone. See 3.3.19.1.

3.3.15 Communicable Disease. See 3.3.24.1.

3.3.16* 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.

3.3.17* 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.

3.3.18 Contaminant. A harmful, irritating, or nuisance material foreign to the normal atmosphere. [**1404,** 2006]

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

3.3.19.1 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.

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

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

3.3.20 Crew. A team of two or more fire fighters.

3.3.21* Cryogenic Liquid. A refrigerated liquefied gas having a boiling point below -130°F (-90°C) at atmospheric pressure. [**1991,** 2005]

3.3.22 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.

3.3.23 Defensive Operations. See 3.3.69.1.

3.3.24 Disease.

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

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

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

3.3.26 Emergency Incident. See 3.3.51.1.

3.3.27 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.

3.3.28 Emergency Operations. See 3.3.69.2.

3.3.29 Eye Protection. See 3.3.73, Primary Eye Protection.

3.3.30* Faceshield. A protective device commonly intended to shield the wearer's face, or portions thereof, in addition to the eyes from certain hazards, depending on faceshield type.

3.3.31 Facility. See 3.3.35, Fire Department Facility.

3.3.32 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]

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

3.3.34* Fire Department. An organization providing rescue, fire suppression, and related services.

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

3.3.36 Fire Department Member. See 3.3.63, Member.

3.3.37 Fire Fighting.

3.3.37.1* **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.

3.3.37.2 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]

3.3.37.3 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,** 2005]

3.3.38 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.

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

3.3.40 Goggle. A protective device intended to fit the face surrounding the eyes in order to shield the eyes from certain hazards, depending on goggle type.

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

3.3.42 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.

3.3.43 Hazardous Atmosphere. See 3.3.5.1.

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

3.3.45 Hazardous Materials Operations. See 3.3.69.3.

3.3.46 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.

3.3.47* **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.

3.3.48 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.

3.3.49 Hot Zone. See 3.3.19.2.

3.3.50 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]

3.3.51 Incident.

3.3.51.1 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]

3.3.51.2 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.

3.3.51.3 Traffic Incident. An emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic.

3.3.52 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.

3.3.53 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]

3.3.54* 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.

3.3.55* Incident Safety Officer. A member of the command staff responsible for monitoring and assessing safety hazards and unsafe situations, and for developing measures for ensuring personnel safety.

3.3.56 Industrial Fire Brigade. An organized group of employees within an industrial occupancy who are knowledgeable, trained, and skilled in at least basic fire-fighting operations, and whose full-time occupation might or might not be the provision of fire suppression and related activities for their employer. [**600,** 2005]

3.3.57* 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.

3.3.58 Infectious Disease. See 3.3.24.2.

3.3.59 Interface Component. Any material, part, or subassembly used in the construction of the compliant product that provides limited protection to interface areas.

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

3.3.61 Life Support.

3.3.61.1 Advanced Life Support (ALS). Emergency medical treatment beyond basic life

support level as defined by the medical authority having jurisdiction.

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

3.3.62* Liquefied Gas. A gas that, under its charged pressure, is partially liquid at 70°F (21°C).

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

3.3.64 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.

3.3.65 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.

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

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

3.3.68 Offensive Operations. See 3.3.69.4.

3.3.69 Operations.

3.3.69.1* 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.

3.3.69.2 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.

3.3.69.3 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.

3.3.69.4 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.

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

3.3.70 Oxygen-Deficient Atmosphere. See 3.3.5.2.

3.3.71* Particulates. Solid matter that is dispersed in air as a mixture. [**1994,** 2007]

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

3.3.73 Primary Eye Protection. A protective device specifically intended to shield the eyes from certain hazards while permitting vision. *(See also 3.3.30, Faceshield; 3.3.40, Goggle; and 3.3.90, Spectacles.)*

3.3.74 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]

3.3.75* Protective Ensemble. Multiple elements of compliant protective clothing and equipment that when worn together provide protection from some risks, but not all risks, of emergency incident operations.

3.3.76 Proximity Fire Fighting. See 3.3.37.1.

3.3.77 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]

3.3.78* 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.

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

3.3.80 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 3.3.93, Technical Rescue.)*

3.3.81 Rescue Incident. See 3.3.51.2.

3.3.82* Respiratory Protection Equipment (RPE). Devices that are designed to protect the respiratory system against exposure to gases, vapors, or particulates. [**1404,** 2006]

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

3.3.84 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]

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

3.3.86 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 3.3.95, Vehicle Safety Harness.)*

3.3.87 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.

3.3.87.1 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]

3.3.88 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.

3.3.89 Special Operations. See 3.3.69.5.

3.3.90* Spectacles. A protective device intended to shield the wearer's eyes from certain hazards depending on the spectacle type.

3.3.91 Structural Fire Fighting. See 3.3.37.2.

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

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

3.3.94 Traffic Incident. See 3.3.51.3.

3.3.95 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 3.3.86, Seat Belt.)*

3.3.96 Warm Zone. See 3.3.19.3.

3.3.97 Wildland Fire Fighting. See 3.3.37.3.

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 for its members an occupational safety and health program that complies with this standard.

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, occupational illnesses, and exposures involving members shall be investigated.

4.4.5.1 All accidents involving fire department vehicles, equipment, or fire department facilities shall be investigated.

4.4.5.2 The fire department shall take the corrective action necessary to avoid repetitive occurrences of accidents and exposure to communicable diseases.

4.4.5.3 Records of such investigations shall be kept in accordance with the applicable provisions of 4.6.1.

4.4.6 Each individual member of the fire department shall cooperate, participate, and comply with the provisions of the occupational safety and health program.

4.4.7 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.

4.4.8 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.

4.4.8.1 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 the

fire chief in an advisory capacity.

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 ensure 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 ensure 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 qualifications defined in NFPA 1521, *Standard for Fire Department Safety Officer*.

4.7.3 The fire chief shall ensure that 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 (PPE) expected to be utilized by members.

5.1.9 As a duty function, members shall be responsible to maintain proficiency in their skills and knowledge, and to avail themselves of the professional development provided to the members 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 AHJ.

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 Search and 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 Drivers/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 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 by placement 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.

6.1.7.1 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* The driver of a fire department vehicle shall be required to possess a valid driver's license for the class of vehicle, as specified by the AHJ.

6.2.2.1 Fire department vehicles shall be operated in compliance with all applicable traffic laws, including special provisions pertaining to emergency vehicles as established by the AHJ, as well as specific rules, regulations, and procedures adopted by the fire department.

6.2.3* The fire department shall establish specific rules, regulations, and procedures relating to the operation of fire department vehicles in an emergency mode, including guidelines to establish when emergency response is authorized and when emergency response is not authorized.

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) At red traffic lights

(3) At stop signs

(4) At negative right-of-way intersections

(5) At 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.

6.2.14* Where members are authorized to respond to incidents or to fire stations in private vehicles, the fire department shall establish specific rules, regulations, and procedures relating to the operation of private vehicles in an emergency mode.

6.2.14.1 These rules and regulations shall be at least equal to the provisions regulating the operation of fire department vehicles.

6.2.14.2* These rules and regulations shall also apply to the use of emergency lighting equipment, audible warning devices, or both on private vehicles.

6.2.14.2.1 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.

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

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, in order 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, *Standard on Fire Department Infection Control Program*.

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 powered rescue tools shall meet the requirements of NFPA 1936, *Standard on Powered Rescue Tools*.

Chapter 7 Protective Clothing and Protective Equipment

7.1 General.

7.1.1* The fire department shall provide each member with protective clothing and protective equipment that is designed to provide protection from the hazards to which the member is likely to be exposed and is 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 as recommended by the protective clothing manufacturer 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, *Standard on Fire Department Infection Control Program*.

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 Ensembles for Structural Fire Fighting and Proximity 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 gaping 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 or other interface component 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 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 1971.

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 gaping 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.

7.4.2.2 Emergency medical work gloves shall be permitted to be used in place of emergency medical examination gloves in situations involving physical hazards.

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 childbirth or situations involving spurting blood.

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 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 use.

7.5* Chemical-Protective Clothing for Hazardous Materials Emergency Operations.

7.5.1* Vapor-Protective Ensembles.

7.5.1.1 Members who engage in operations during hazardous materials emergencies where there is the potential for exposure to known chemicals in gaseous or vapor form that pose skin hazards, to chemicals that have not been identified, or to chemical environments that are classified as immediately dangerous to life or health (IDLH) shall be provided with and shall use vapor-protective ensembles that meet the applicable requirements of NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies*.

7.5.1.2 Prior to use of the ensemble, members who engage in hazardous materials operations shall consult the technical data package, manufacturers' instructions, and manufacturers' recommendations as provided and required by NFPA 1991, to ensure that the ensemble is designed to provide the member protection for the specific hazardous materials emergency.

7.5.1.3 All members who engage in operations during hazardous materials emergencies where there is potential for exposure to known chemicals in gaseous or vapor form that pose skin hazards, to chemicals that have not been identified, or to chemical environments that are classified as IDLH shall be provided with and shall use SCBA that meet the applicable requirements of Section 7.11.

7.5.1.3.1 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, *Approval of respiratory protective devices*.

7.5.1.4 Vapor-protective ensembles, certified to the 2005 edition of NFPA 1991, shall be permitted to be used for protection from chemical agents, biological agents, and radioactive particulate encountered during terrorism incidents.

7.5.1.5 Where the risk assessment shows that members will also be exposed to liquefied gases, members shall be provided with and shall use vapor-protective ensembles that meet the additional optional requirements for liquefied gas protection in NFPA 1991.

7.5.1.6 Where the risk assessment shows that members will also be exposed to potential chemical flash fires, members shall be provided with and shall use vapor-protective ensembles that meet the additional optional requirements for chemical flash fire protection in NFPA 1991.

7.5.1.7* Vapor-protective ensembles shall not be used alone for any fire-fighting

applications or for protection from ionizing radiation, cryogenic liquid hazards, or explosive atmospheres.

7.5.1.8 Vapor-protective ensembles shall be permitted to be used for protection from liquid splashes or solid chemicals and particulates.

7.5.2* Liquid Splash-Protective Ensembles and Clothing.

7.5.2.1 Members who engage in operations during hazardous materials emergencies that will expose them to known chemicals in liquid-splash form shall be provided with and shall use liquid splash-protective ensembles or clothing that meet the applicable requirements of NFPA 1992, *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies*.

7.5.2.2 Prior to use of the ensemble or clothing, members who engage in hazardous materials operations shall consult the technical data package, manufacturers' instructions, and manufacturers' recommendations as provided and required by NFPA 1992, to ensure that the ensemble or clothing is designed to provide the member protection for the specific hazardous chemical emergency.

7.5.2.3 All members who engage in operations during hazardous materials 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 other respiratory protective devices that are certified by NIOSH under 42 CFR 84 as suitable for the specific chemical environment.

7.5.2.3.1 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.

7.5.2.4 Liquid splash-protective ensembles or clothing shall not be used for protection from chemicals in vapor form or from unknown liquid chemicals or chemical mixtures.

7.5.2.4.1 Only vapor-protective ensembles specified in 7.5.1 and SCBA specified in 7.11.1 shall be considered for use.

7.5.2.5 Liquid splash-protective ensembles or clothing shall not be used for protection from chemicals or specific chemical mixtures that have a vapor pressure greater than 5 mm Hg at 77°F (25°C) and have known or suspected carcinogenicity as indicated by one of the following documents:

(1) *Sax's Dangerous Properties of Industrial Materials*

(2) NIOSH *Pocket Guide to Chemical Hazards*

7.5.2.6 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, *TVLs® and BEIs®*, and that have a vapor pressure greater than 5 mm Hg at 77°F (25°C).

7.5.2.7 Where the risk assessment shows that members will also be exposed to potential chemical flash fires, members shall be provided with and shall use liquid splash-protective

ensembles and clothing that meet the additional optional requirements for chemical flash fire protection in NFPA 1992.

7.5.2.8* Liquid splash-protective suits shall not be used alone for any fire-fighting applications or for protection from ionizing radiation, biological, liquefied gas or cryogenic liquid hazards, or 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 CBRN Terrorism Incidents.

7.5.3.1 Members who engage in assessment, extrication, rescue, triage, treatment decontamination, and support function operations for incidents involving CBRN terrorism agents shall be provided with the protective ensembles and protective equipment specified in 7.5.3.3 through 7.5.3.6.

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 involving CBRN terrorism agents, the incident commander shall perform a risk assessment of the incident to determine the type of protective ensembles and other protective equipment that is needed.

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 ensembles certified as compliant with NFPA 1991:

(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 for incidents involving CBRN terrorism agents and who are required to 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 NIOSH *Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Open Circuit*

Self-Contained Breathing Apparatus (SCBA)

7.5.3.4 Where the risk assessment indicates one or more of the following, all members who will be performing the operations for incidents involving CBRN terrorism agents shall be provided with and shall use at least Class 2 ensembles certified as compliant with NFPA 1994, *Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents*:

(1) Exposure is at IDLH conditions.

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

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

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

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

7.5.3.4.1 All members who engage in operations for incidents involving CBRN terrorism agents and who are required to wear NFPA 1994 Class 2 ensembles shall use 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)*.

7.5.3.5 Where the risk assessment indicates one or more of the following, all members who will be performing the operations for incidents involving CBRN terrorism agents shall be provided with and shall use at least Class 3 ensembles certified as compliant with NFPA 1994:

(1) Exposure is at levels below IDLH conditions.

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

(3) Victims are symptomatic but ambulatory.

7.5.3.5.1 All members who engage in operations for incidents involving CBRN terrorism agents and who are required to wear NFPA 1994 Class 3 ensembles shall use one of the following types of respirators:

(1) 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)*

(2) Air-purifying respirators (APRs) 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* Where the risk assessment indicates the potential presence of biological or radiological particulates only, all members who will be performing the operations for

incidents involving CBRN terrorism agents shall be provided with and shall use at least Class 4 ensembles certified as compliant with NFPA 1994.

7.5.3.6.1 All members who engage in operations during chemical and biological terrorism incidents and who are required to wear NFPA 1994 Class 4 ensembles shall use one of the following types of respirators:

(1) 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)*

(2) 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)*

7.5.3.7 Vapor-protective ensembles, certified as compliant with NFPA 1991, that are used in operations involving any exposure to CBRN 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.

7.5.3.8 All NFPA 1994 Class 2, Class 3, and Class 4 protective ensembles and NFPA 1971 protective ensembles with the CBRN option that are used in operations involving any exposure to chemical or biological terrorism agents shall be disposed of following that use.

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

7.5.3.10 All protective ensembles that are to be used for incidents involving CBRN terrorism agents shall be inspected and maintained as required by the technical data package and the 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 an exposure to a chemical or a 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 and protective equipment 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 be provided with a fire shelter, in a crush-resistive case, and wear it in such a way as to allow for rapid deployment.

7.7.4 Members who engage in or are exposed to the hazards of wildland fire fighting shall be provided with and shall use primary eye protection that meets the requirements of NFPA 1977.

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 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, to the side (either left or right), and 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 (APRs) and powered air-purifying respirators (PAPRs) are selected to provide the respiratory protection, the APRs and PAPRs shall be provided with the 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 Members who engage in or are exposed to the hazards of search, rescue, recovery, and site stabilization for technical rescue shall be provided with and shall use primary eye protection that meets the requirements of NFPA 1951.

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

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

7.8.5.2 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 use of respiratory protection equipment (RPE), 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 RPE based on hazard exposure levels, 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 use of respiratory protection.

7.9.3 Members shall be qualified at least annually in the use of RPE 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 A reserve air supply shall be provided by use of reserve cylinders or by an on-scene refill capability, or both.

7.9.6 RPE 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 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 Fire and Emergency Services*.

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 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 AHJ.

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 (APRs) shall be used only in non-IDLH atmospheres for those contaminants that NIOSH certifies them against.

7.11.3.2 The AHJ shall provide NIOSH-certified respirators that protect the user and ensure compliance with all other OSHA requirements.

7.11.3.3* The AHJ 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 RPE shall be verified by quantitative fit testing on an annual basis and whenever new types of RPE or facepieces are issued.

7.12.2 The fit of the RPE of each new member shall be tested before the members are permitted to use RPE 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 RPE.

7.12.3 Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators shall be accomplished by performing quantitative 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* Quantitative test protocols shall be conducted as required by the AHJ.

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 full facepiece respiratory protection, the facepiece shall be fitted with spectacles in such a manner that they 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, air transfer, or a supplied-air source shall be an approved method to provide a source of breathing air.

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* 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.

7.15.3 Each PASS device shall be tested at least weekly and prior to each use and shall be maintained in accordance with the manufacturers' instructions.

The text of Section 7.15 and its Annex A paragraphs has been revised by a tentative interim amendment (TIA). See page 1.

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 Life Safety Rope and Equipment for Emergency Services*.

7.16.2 Rope used to support the weight of members or other persons during rescue, fire fighting, other emergency operations, or training evolutions shall be life safety rope and shall meet the requirements of NFPA 1983.

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 Rope inspection shall be conducted by qualified inspectors in accordance with rope inspection procedures established and recommended by the rope manufacturer to assure rope is appropriate for reuse.

7.16.5 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 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* Primary eye protection shall meet the requirements of ANSI Z87.1, *Practice for Occupational and Educational Eye and Face Protection*.

7.17.1.2 Face protection shall be in addition to primary eye protection unless SCBA is being used.

7.17.1.3 The helmet faceshield alone shall not be considered and shall not be used as primary eye 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 primary eye protection that is designed to protect the member's eyes from the expected hazards.

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 respective NFPA standard for that 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' PPE 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, *Standard on Emergency Services Incident Management System*, 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 who 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 CBRN exposure, the incident commander shall assess the risk to members and ensure that protective equipment appropriate for the risk is available for and used by members.

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 full protective clothing, protective equipment, and SCBA appropriate for the risk that might be encountered.

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 (BLS) 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 BLS 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, *Standard on Life Safety Rope and Equipment for Emergency Services*.

8.5.23 The incident commander shall ensure fire investigators or other members that enter an IDLH atmosphere or hazardous area use the PPE, SCBA, or both, as appropriate for risks that might be encountered.

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 PPE (SCBA, flash hood, etc.) appropriate for the risks that might be encountered 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* Traffic 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 traffic 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.

8.7.4.1 When acting as a shield, apparatus warning lights shall remain on, if appropriate.

8.7.4.2 All additional responding vehicles, when arriving on the scene, shall position beyond the traffic barrier unless their function requires placement before the barrier.

8.7.5* One or more of the following warning devices shall be used to warn oncoming traffic of the emergency operations and the hazards to members operating at the incident:

(1) Fluorescent and retro-reflective warning devices such as traffic cones

(2) Federal Highway Administration (FHWA)-approved 48 in. by 48 in. retro-reflective signs stating “Emergency Scene Ahead” (with directional arrow overlay)

(3) Illuminated warning devices such as highway flares

(4) Other warning devices appropriate to warn oncoming traffic of the emergency operations

8.7.6 Warning devices shall be placed and utilized with proper considerations given to visual obstruction such as hills, curves, blind spots, or unusual localized weather conditions such as fog or rain.

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

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

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

8.7.10* When members are operating at a traffic 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.

8.7.11* Members used for traffic control 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 (RIC) shall consist of at least two members and shall be available for rescue of a member or a crew.

8.8.2.1 Each RIC shall be fully equipped with 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 RICs 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 3.5 ft^3 (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, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*.

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, *Standard for Fire Department Safety Officer*.

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, *Standard on Fire Department Infection Control Program*.

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*, *Life Safety Code*.

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 qualified for duty 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*.

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 Candidates shall be qualified as meeting the physical performance requirements established by the fire department prior to entering into a training program to become a fire fighter.

10.2.3 Members who engage in emergency operations shall be annually qualified as meeting the physical performance requirements established by the fire department.

10.2.4 Members who do not meet the required level of physical performance shall not be permitted to engage in emergency operations.

10.2.5 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 a level of fitness that allows them 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 and fitness 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 a qualified person 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 assistance, treatment, or both that is intended to return the member to a condition that will allow him or her to perform the essential job functions.

10.7.4 A member who has been determined to be unable to perform the essential job functions will only be returned to duty when a qualified person 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 member assistance program shall refer members and, if appropriate, their immediate families to health care services that can assist them with restoring their health and their job performance to expected levels.

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.1.4.1 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 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.1.5.2 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.2) 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 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.3.3.4 Aircraft Rescue and Fire Fighting. Such rescue and fire-fighting actions are performed both inside and outside of the aircraft.

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, *Standard on Comprehensive Occupational Medical Program for Fire Departments*) 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 Chemical Flash Fire. A policy of wearing protective clothing is needed that recognizes the significant threat to fire fighters who can be exposed to flash fires in either structural fire-fighting or hazardous materials environments. It is hoped that fire fighters utilize awareness training on burn injuries caused by the ignition of the environment. There is a distinct difference between chemical flash fires and flashovers occurring in structural fire-fighting environments.

Flashover is a phenomenon that generates temperatures in the range of 1200°F to 1500°F (650°C to 815°C). A chemical flash fire requires an ignition source and a chemical atmosphere that contains a concentration above the lower explosive limit (LEL) of the chemical. Chemical flash fires generate heat from 1000°F to 1900°F (540°C to 1040°C). As a rule, a structural fire flashover is confined to a designated area with walls as a boundary. The size of a chemical flash fire depends on the size of the gas or vapor cloud and, when ignited, the flame front expands outward in the form of a fireball. The resulting effect of the fireball's energy with respect to radiant heat significantly enlarges the hazard areas around the gas released. [**1991,** 2005]

A.3.3.12 Clear Text. Ten codes or agency-specific codes should not be used when using clear text.

A.3.3.16 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 is 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.3.3.17 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.3.3.21 Cryogenic Liquid. Cryogenic liquids include, but are not limited to, helium, nitrogen, and oxygen. [**1991,** 2005]

A.3.3.24.1 Communicable Disease. Also known as contagious disease.

A.3.3.30 Faceshield. Faceshields should be used only in conjunction with spectacles and/or goggles.

A.3.3.34 Fire Department. The term *fire department* can include any public, governmental, private, industrial, or military organization engaging in this type of activity.

A.3.3.35 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.3.3.37.1 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.3.3.39 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.3.3.41 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.3.3.47 Health and Safety Officer. This individual can be the incident safety officer, or that can also be a separate function.

A.3.3.54 Incident Management System (IMS). The system is also referred to as an incident command system (ICS).

A.3.3.55 Incident Safety Officer. The incident safety officer can have assistants.

A.3.3.57 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.3.3.62 Liquefied Gas. Examples of liquefied gases include, but are not limited to, ammonia, 1,2-butadiene, chlorine, ethylene oxide, hydrogen chloride, liquefied petroleum gas, and methyl chloride. Testing in NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies*, is only conducted for a limited number of liquefied gases. Users should consult the technical data package to determine which liquefied gases have been tested with the suit's primary materials. [**1991,** 2005]

A.3.3.63 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.3.3.69.1 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.3.3.69.5 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.3.3.71 Particulates. Particulates do not include aerosols or suspended liquid droplets in air. Aerosols are considered liquids.

A.3.3.75 Protective Ensemble. The elements of the protective ensemble are coats, trousers, coveralls, helmets, gloves, footwear, and interface components.

A.3.3.78 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, *Standard on Emergency Services Incident Management System*, 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.3.3.82 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.3.3.90 Spectacles. Safety glasses are an example of spectacles.

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 in Chapter 4 of *Managing Fire and Rescue Services*, published by the International City/County 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.

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 re-evaluate

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.

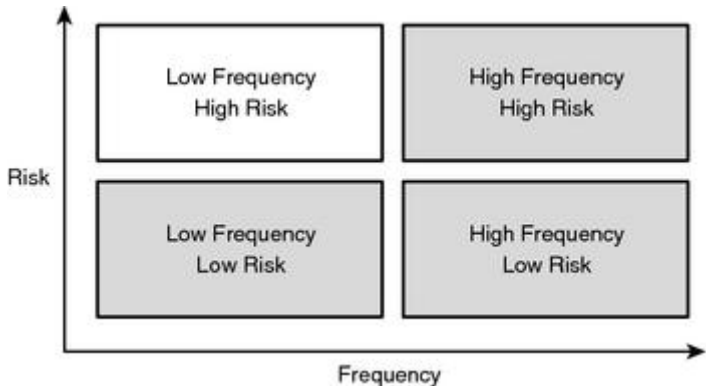


FIGURE A.4.2.3 Risk and Frequency Graph.

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 with/or operation of equipment, or equipment malfunctions or design shortcomings.

Managing the infinite possibilities of near-miss incidents and accidents is laborious and seems overwhelming. 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 in 4.5.3.1 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 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 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 (fire fighter, 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 drivers/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 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 hours 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) Knowing 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) Knowing how to perform basic control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit

(5) Knowing 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.5.3.1 In order to ensure compliance with the minimum requirements of NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, fire department training programs should be accredited by a training organization such as a state fire training agency. 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 reinforcement of those policies through comprehensive training.

The AHJ should ensure that each member demonstrates knowledge of at least the following:

(1) Why respiratory protection equipment (RPE) 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 RPE are

(3) How to use the RPE effectively in emergency situations, including situations in which the RPE 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 RPE

(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, *Standard for Fire Apparatus Driver/Operator Professional Qualifications*.

A.6.1.1 It is recommended that only apparatus that were designed and manufactured to meet the 1991 or later editions of the NFPA fire apparatus standards or that have been refurbished in accordance with NFPA 1912, *Standard for Fire Apparatus Refurbishing*, to meet the 1991 or later editions of the NFPA fire apparatus standards be permitted to operate in first-line service. This will ensure that, while the apparatus may not totally comply with the current edition of the Automotive Fire Apparatus standards, many of the improvements and upgrades required by the standards since 1991 are available for the fire fighters who use the apparatus.

It is recommended that an apparatus manufactured prior to 1991 that is less than 25 years old, that has been properly maintained, and that is still in serviceable condition be placed in reserve status and upgraded to incorporate as many features of the post-1991 fire apparatus as possible. Apparatus not manufactured to NFPA fire apparatus standards or that is over 25 years old should be replaced.

See Annex D of NFPA 1901, *Standard for Automotive Fire Apparatus*, for more complete guidelines for first-line and reserve fire apparatus.

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, *Standard for a Fire Service Vehicle Operations Training Program*, can be used to meet the requirements of an “approved driver training program.”

A.6.2.2 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 Policies should be enacted to limit unnecessary and inappropriate emergency response, as a means of reducing the risk of accidents involving emergency vehicles.

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 crossings 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 to 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 communication 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 AHJ. 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 2 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 (USFA) 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. The report provides comprehensive information on the safe construction, use, and operation of fire department tankers/tenders. The report deals with fire apparatus with water tanks sizes of 1000 gal (3800 L) 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 fire fighters 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 then 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 drivers/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 study by NTSB 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.6.2.14 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 AHJ. All members should be held strictly accountable for compliance with the applicable traffic laws and regulations as well as fire department rules, regulations, and procedures relating to emergency response. Where traffic laws and regulations allow for private vehicles to be operated as emergency vehicles, the fire department should only allow members who have met the requirements to drive fire department vehicles in an emergency mode to drive privately owned vehicles in an emergency mode.

A.6.2.14.2 For more information, see FA-220, *Firefighter Fatality Retrospective Study*, Federal Emergency Management Agency, United States Fire Administration, April 2002.

A.6.3.1 It is intended that the requirements of Section 6.3 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 A.6.3.4(2) through A.6.3.4(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 A.6.3.5(2) through A.6.3.5(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 Primary eye and/or face protection should be issued to members who might ride in either exposed positions in open cab apparatus or open tiller seats. Department standard operating procedures 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 protective 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 that 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 noncontaminated 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 1851, 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.7.2.4.2 Some protective coats, particularly those certified as part of a protective ensemble with the CBRN option, may include different interface components instead of wristlets to provide increased integrity against penetration of CBRN terrorism agents.

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 ensembles 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 25 chemicals and 2 chemical warfare agents, which were selected because they are representative of the classes of chemicals that are encountered during hazardous materials emergencies and terrorism incidents involving chemical agents. Vapor-protective ensembles should resist permeation by the chemicals present during a response. Permeation is the movement of chemical through a material at a molecular level. The effects of permeation are often unobservable. Permeation resistance is measured in terms of breakthrough time and permeation rate or the amount of cumulative permeation in the case of chemical warfare agents. An acceptable material is one where the breakthrough time exceeds the expected period of garment use and the measured permeation rate is below the minimum permeation rate used for determining breakthrough time. Chemical permeation resistance for 1 hour or more against each chemical in the NFPA 1991 battery is required for primary suit materials (garment, visor, gloves, footwear, and seams) for testing of industrial chemicals. Acceptable performance of materials against chemical warfare agents is determined by measuring the amount of permeating chemical that passes through the material within 1 hour. This cumulative permeation is compared against acceptable dose levels that have been established for safe use of protective clothing without effects to individual wearers. To be certified for any additional chemicals or specific chemical mixtures, an ensemble must 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 or conditions that might be encountered during a terrorism incident involving chemical agents, biological agents, or radiological particulates. To determine adequate suit component performance in hazardous chemical environments, the following tests are required by NFPA 1991:

(1) An ensemble pressurization test to check the airtight integrity of each protective suit

(2) An inward leakage test to demonstrate that the ensemble prevents the inward leakage of vapors or gases

(3) An overall suit water penetration test designed to ensure the suit provides full-body protection against liquid splashes

(4) Penetration resistance testing of closures

(5) Leak and cracking 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. Additional optional criteria based on additional tests are provided for demonstrating protection against liquefied gases or chemical flash fires.

A.7.5.1.7 Materials used in vapor-protective ensembles 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 ensembles during fire-fighting operations. There are no test requirements or performance criteria in NFPA 1991 addressing protection from

ionizing radiation, cryogenic liquid hazards, or explosive atmospheres.

A.7.5.2 NFPA 1992 covers liquid splash-protective ensembles or clothing, 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 ensembles or clothing 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 ensembles or 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 or skin-toxic chemicals involving chemicals with vapor pressures above 5 mm Hg at 25°C (77°F), or where the splash-protective ensemble or clothing has not been certified for the chemical exposure, an ensemble compliant with NFPA 1991 should be utilized.

NFPA 1992 specifies a battery of seven chemicals including liquid chemicals with low vapor pressures with no known skin absorption toxicity or no known or suspected human carcinogenicity, that are representative of the classes of chemicals likely to be encountered during hazardous materials emergencies. Chemical-penetration resistance against the NFPA 1992 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. Additional optional criteria are provided for demonstrating protection against chemical flash fires.

Other NFPA 1992 performance requirements include an overall suit water-penetration test to ensure the suit provides integrity of the ensemble or clothing against the inward leakage of liquids. The 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. The 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 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 ionizing radiation, biological, liquefied gas, or cryogenic liquid hazards, from flammable or explosive atmospheres, or from hazardous chemical vapor atmospheres.

A.7.5.3 CBRN protection is addressed in three standards, including NFPA 1991, NFPA 1994, and NFPA 1971. NFPA 1991 provides requirements for the highest level of CBRN protection, where hazards involving CBRN terrorism agents are most severe. These include the conditions where the agent has not been identified, the release is still occurring, and victims in the area of the release are apparently dead or unconscious. Testing of ensembles for NFPA 1991 requirements is described in A.7.5.1.

NFPA 1994 sets requirements for different classes of protective ensembles for use at incidents involving CBRN terrorism agents as used by first responders. Class 2 ensembles provide the highest level of protection against CBRN terrorism agents, including vapors, liquids, and particulates, and have performance consistent with SCBA use for IDLH

conditions. Class 3 ensembles also protect against CBRN terrorism agents that include vapors, liquids, or particulates, but are at conditions of exposure that are less than IDLH, which would permit the use of air-purifying respirators (APRs).

There are two primary areas of evaluation: tests for integrity of the ensemble against the hazardous environment, and tests of the material to demonstrate how it acts as a barrier against different CBRN terrorism agents. There are three different integrity tests. An inward leakage test is applied to Class 2 and Class 3 ensembles using the Man-in-Simulant test (MIST). This test measures the inward leakage of a surrogate agent into the clothing while worn by a test subject. The higher the MIST result or protection factor, the better the integrity. Class 2 performance has been set for levels that are consistent based on SCBA use while Class 3 performance is consistent with APR use. MIST does not apply to Class 4 because these ensembles are not intended to provide chemical protection. Class 4 protective ensembles provide only biological or radiological particulate protection. A liquid integrity test is applied to each ensemble. A longer test is used for Class 2 than for Class 3 and Class 4. The liquid integrity test is applied to Class 4 because this clothing could be subjected to wet decontamination. For Class 4, a particle integrity test is used where a test subject wears the ensemble inside a closed environment with fluorescent particles. Particle leakage is detected using ultraviolet light. This particle test is not applied to Class 2 and Class 3 because it is believed that successful MIST evaluations indicate particle holdout. For material tests, permeation testing as described in A.7.5.1 is used for Class 2 and Class 3 ensembles. For Class 2, permeation testing with gases is carried out at levels that are used for CBRN approvals of APRs. The liquid chemical permeation tests for Class 2 are performed using the more rigorous closed-top procedures compared to open-top procedures for Class 3. All ensemble materials are evaluated for viral-penetration resistance using a bloodborne pathogen surrogate.

The CBRN option for NFPA 1971 is based on Class 2 performance. The same integrity and material barrier requirements are applied; however, ensemble elements and materials are subjected to extensive conditioning involving laundering, heat exposures, repeated flexing, and abrasion prior to testing integrity and barrier characteristics. The tests are intended to simulate extensive use of the ensemble prior to encountering CBRN terrorism agents. *(See also A.7.5.3.6)*.

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.

A.7.5.3.6 The CBRN option for structural and proximity fire-fighting protective ensembles in NFPA 1971 can only be applied to complete ensembles of garments, helmet, gloves, footwear, and hood with a specified SCBA that has been certified by NIOSH as compliant with the NIOSH *Standard for Chemical, Biological, Radiological, and Nuclear (CBRN) Full Facepiece Air Purifying Respirator (APR)*. Non-CBRN elements cannot be used with the CBRN ensemble. CBRN ensembles are only intended to allow members escape and provide rescue during the escape when CBRN agents are encountered.

A.7.7.1 Fire departments that provide both wildland and structural fire-fighting services

should establish guidelines for members on which ensemble to wear for a given fire-fighting or other emergency incident.

A.7.7.3 Fire shelters are no longer addressed in NFPA 1977. Specifications for fire shelters are provided in USDA Forest Service Specification 5100-606, *Shelter Fire*.

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 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. Urban search and rescue (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. APRs 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, *Respiratory protection*, 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 AHJ, 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. 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 In quantitative fit testing, the testing 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 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 an excerpt from 29 CFR 1910.134(g):

"(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. However, 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.

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, *Standard for Automotive Fire Apparatus*.

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 AHJ 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 AHJ can choose which method best applies to its personnel. Such protection can consist of refilling cylinders in an enclosure considered acceptable to the AHJ. The protection 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 AHJ.

A.7.14.6 The possibility exists for catastrophic failure of SCBA cylinders during refilling.

A.7.15.1 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. Fire departments are encouraged to utilize this technology. 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.7.15.2 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 ensure 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 has been 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.7.17.1.1 Some examples of primary eye protection are goggles and safety glasses, as they

provide specific and substantial eye protection against penetration and impact. Helmet faceshields are not primary eye protection, as they do not provide eye protection and should not be relied upon for eye protection. Faceshields should be used to protect the face as secondary protection to primary eye protection. Faceshields currently are often used incorrectly as the only form of eye protection. It is evident that when faceshields are exposed to ultraviolet degradation, abrasion, and products of combustion, they become scratched, cloudy, opaque, and can be rendered unserviceable in a very short period of time. In many instances, the faceshield is lifted so that the wearer can see what he is doing, leaving the eyes unprotected and exposed to the dangers of flying debris. Goggles and other primary eye devices are more easily protected from damage and also provide specific protection for the wearer's eyes. There are numerous products on the market to protect the goggles from damage when stored on the helmet. Users desiring to keep goggles or eye protection stored on top of the helmets should consider one of these devices. The SCBA facepiece can provide both primary eye protection and full-face protection.

A.7.18.1 The use of PPE 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 km/h) on a level, hard, smooth surface road. However, it is recommended that the specifications 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 km/h). 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 are 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 FA-118, *Fire and Emergency Service 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) Backup 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 after evaluating the survival profile of any victims in the involved compartment:

(1) We will risk our lives a lot, in a calculated manner, to save SAVABLE LIVES.

(2) We will risk our lives a LITTLE, in a calculated manner, to save SAVABLE

property.

(3) We WILL NOT risk our lives at all for a building or lives that are already lost.

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 does not 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, *Respiratory protection*.

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 in their response plan the manner in which they plan to assemble members. 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 hose line 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 hose line 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, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.)*

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 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.

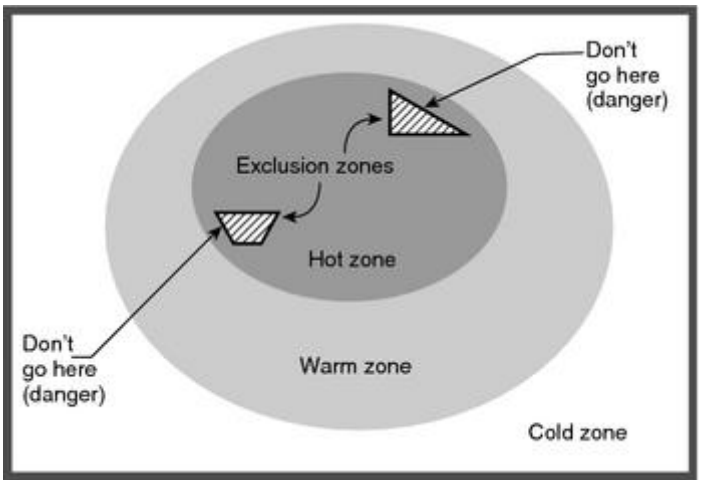


FIGURE A.8.6.2 Example of Control Zones.

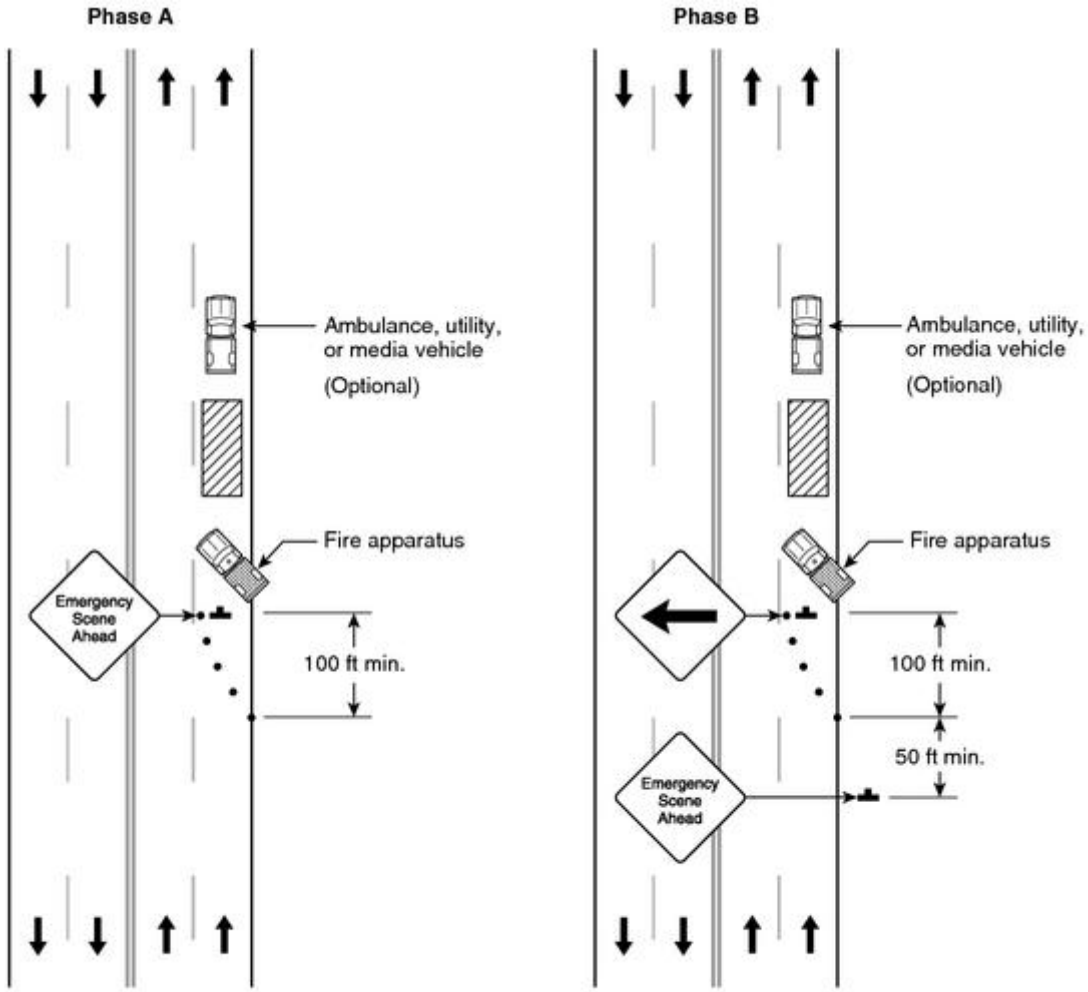
A.8.6.2.2 Members entering the hot zone without an assigned task are placing themselves at greater risk for no reason. In addition, they can be increasing the risk of others operating within this zone by creating some confusion.

A.8.7 For additional information on establishing safe practices at highway incidents, see the NFSIMSC publication, *Incident Management System Model Procedures Guide for Highway Incidents*, the U.S. Fire Administration publication FA-272, *Emergency Vehicle Safety Initiative*, and the U.S. DOT publication, *Manual on Uniform Traffic Control Devices for Streets and Highways*, Chapter 6I.

A.8.7.5 Warning signs should be placed in the following sequence based on the expected on-scene time:

(1) The initial arriving apparatus should deploy the sign as shown in "Phase A" in Figure A.8.7.5.

(2) If the incident is expected to take longer than 15 to 30 minutes, a second sign should be deployed as shown in "Phase B" in Figure A.8.7.5, and the original "Emergency Scene Ahead" sign should be changed to the appropriate directional arrow.



Phase A: Install sign after arrival, channelizing devices within 15 minutes of arrival.
Phase B: Install within 15 minutes after arrival of second apparatuses.

FIGURE A.8.7.5 Typical Emergency Scene Application.

A.8.7.10 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.8.7.11 Proper training on traffic control can be obtained from local or state highway departments, law enforcement, and other agencies involved with controlling the 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 the 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 in 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 “Active Versus Passive Cooling During Work in Warm Environments While Wearing Firefighting Protective Clothing,” by G. A. Selkirk, T. M. McLellan, and J. Wong.

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 PPE

(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 member's 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) Providing 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 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.

A.8.10.3 Such situations include but are not 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, *Uniform Fire Code*; NFPA 70, *National Electrical Code*; NFPA *101*, *Life Safety 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, *Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling Units*, 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 know 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 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) Manual.

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, *Hazardous waste operations and emergency response*.

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:

(1) The physical location of the member assistance program should facilitate easy access while ensuring confidentiality.

(2) 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.

(3) 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 resources 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 FA-100, *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 Monitoring Compliance with a Fire Service Occupational Safety and Health Program

This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.

B.1

The purpose of this standard is to specify the minimum requirements for an occupational safety and health program for a fire department *(see 1.2.1)*. Further, paragraph 1.2.4 says that nothing in the standard is intended to restrict any jurisdiction from exceeding the minimum requirements stated in the standard. Section 1.5 requires that when the 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. As part of that adoption, the fire department is required to adopt a risk management plan that includes a written plan for compliance with this standard.

B.2

The worksheet (see Figure B.2) in this annex was developed to provide a template for fire departments that are beginning implementation of an occupational safety and health program or that are evaluating the current status of their programs.

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET

Fire Department: _____ Date: _____

Person(s) Completing Worksheet

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 1 Administration				
1.4 Equivalency				
1.4.1 Equivalency levels of qualifications				
1.4.2 Training, education, competency, safety				
Chapter 4 Organization				
4.1 Fire Department Organizational Statement				
4.1.1 Written statement or policy				
4.1.2 Operational response criteria				
4.1.3 Statement available for inspection				
4.2 Risk Management Plan				
4.2.1 Written risk management plan				
4.2.2 Risk management plan coverage				
4.2.3 Risk management plan components				
4.3 Safety and Health Policy				
4.3.1 Written fire department occupational safety and health policy				
4.3.2 Program complies with NFPA 1500				
4.3.3 Evaluate effectiveness of plan				
4.4 Roles and Responsibilities				
4.4.1 Fire department responsibility				
4.4.2 Comply with laws				
4.4.3 Fire department rules, regulations, and SOPs				
4.4.4 Accident investigation procedure				
4.4.5 Accidents and illnesses investigated				
4.4.6 Individuals cooperate, participate, and comply				

FIGURE B.2 Fire Service Occupational Safety and Health Program Worksheet.

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 4 Organization *(continued)*				
4.4.7 Member has right to be protected and participate				
4.4.8 Member organization role				
4.5 Occupational Safety and Health Committee				
4.5.1 Establish committee				
4.5.2 Committee purpose				
4.5.3 Regular meetings				
4.6 Records				
4.6.1 Accidents, injury, illness, exposures, death records				
4.6.2 Occupational exposures				
4.6.3 Confidential health records				
4.6.4 Training records				
4.6.5 Vehicles and equipment records				
4.7 Appointment of the Health and Safety Officer				
4.7.1 Appointed by fire chief				
4.7.2 Meets qualifications				
4.7.3 Given authority to administer program				
4.7.4 Performing functions in NFPA 1521				
4.7.5 Managing occupational safety and health program				
4.7.6 Additional safety officers and resources available				
Chapter 5 Training, Education, and Professional Development				
5.1 General Requirements				
5.1.1 Establish and maintain safety and health training				
5.1.2 Training commensurate with duties and functions				
5.1.3 Training and education programs for new members				
5.1.4 Restrict the activities of new members				
5.1.5 Training on the risk management plan				
5.1.6 Training on department's written procedures				
5.1.7 Training for emergency medical services				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 5 Training, Education, and Professional Development *(continued)*				
5.1.8 Training on operation, limitation, maintenance, and retirement criteria for personal protective equipment				
5.1.9 Maintaining proficiency in skills and knowledge				
5.1.10 Training includes safe exiting and accountability				
5.1.11 Training includes incident management and accountability system used by the fire department				
5.2 Member Qualifications				
5.2.1 Fire fighters meet NFPA 1001				
5.2.2 Drivers/operators meet NFPA 1002				
5.2.3 Airport fire fighters meet NFPA 1003				
5.2.4 Fire officers meet NFPA 1021				
5.2.5 Wildland fire fighters meet NFPA 1051				
5.2.6 Hazardous materials responders trained to at least operations level per NFPA 472				
5.3 Training Requirements				
5.3.1 Adopt or develop training and education curriculums				
5.3.2 Training supports minimum qualifications and certifications of members				
5.3.3 Members practice assigned skill sets on a regular basis but not less than annually				
5.3.4 Training for members when written policies, practices, procedures, or guidelines are changed				
5.3.5 SCBA training program per NFPA 1404				
5.3.6 Wildland fire fighters trained at least annually in the proper deployment of fire shelter				
5.3.7 Live fire training in accordance with NFPA 1403				
5.3.8 Supervised training				
5.3.9 Emergency medical services training				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 5 Training, Education, and Professional Development *(continued)*				
5.3.10 Training on care, use, inspection, maintenance, and limitations of the protective clothing and equipment				
5.3.11 Incident management training to NFPA 1561				
5.3.12 Infectious disease control training to NFPA 1581				
5.4 Special Operations Training				
5.4.1 Advanced training for special operations				
5.4.2 Train members for support to special operations				
5.4.3 Technician level for hazardous materials mitigation				
5.4.4 Rescue technician training to NFPA 1006 when required				
5.5 Member Proficiency				
5.5.1 Proficiency of members				
5.5.2 Monitor training progress				
5.5.3 Annual skills check				
Chapter 6 Fire Apparatus, Equipment, and Drivers/Operators				
6.1 Fire Department Apparatus				
6.1.1 Safety and health concerns related to fire apparatus				
6.1.2 New fire apparatus meets NFPA 1901				
6.1.3 New wildland fire apparatus meets NFPA 1906				
6.1.4 New marine fire-fighting vessels meet NFPA 1925				
6.1.5 Tools, equipment, and SCBA properly secured				
6.1.6 Apparatus refurbished per NFPA 1912				
6.1.7 Restraints and harnesses for aircraft operations				
6.2 Drivers/Operators of Fire Department Apparatus				
6.2.1 Successful completion of approved driver training				
6.2.2 Complies with traffic laws including having valid driver's licenses				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 6 Fire Apparatus, Equipment, and Drivers/Operators *(continued)*				
6.2.3 Rules and regulations for operating fire department vehicles				
6.2.4 Drivers are responsible				
6.2.5 All persons secured				
6.2.6 Drivers obey all traffic laws				
6.2.7 SOPs for non-emergency and emergency response				
6.2.8 Emergency response, drivers bring vehicle to a complete stop				
6.2.9 Proceed only when safe				
6.2.10 Stop at unguarded railroad grade crossings				
6.2.11 Use caution at guarded railroad grade crossings				
6.2.12 SOPs — engine, transmission and driveline retarders				
6.2.13 SOPs — manual brake limiting valves				
6.2.14 Rules and regulations for private vehicles for emergency response				
6.3 Riding in Fire Apparatus				
6.3.1 Tail steps and standing prohibited				
6.3.2 Seat belts not released while the vehicle is in motion				
6.3.3 Secured to vehicle while performing emergency medical care				
6.3.4 Hose loading operations				
6.3.5 Tiller training				
6.3.6 Helmets for riding in unenclosed areas				
6.3.7 Eye protection for riding in unenclosed areas				
6.3.8 Alternative transportation				
6.4 Inspection, Maintenance, and Repair of Fire Apparatus				
6.4.1 Apparatus inspected at least weekly or within 24 hours after any use				
6.4.2 Preventive maintenance program				
6.4.3 Fire apparatus inspection, maintenance, and repair per NFPA 1915				
6.4.4 Establish list of defects to declare vehicle unsafe				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 6 Fire Apparatus, Equipment, and Driver/Operators *(continued)*				
6.4.5 Emergency vehicle technicians meet NFPA 1071				
6.4.6 Pumpers service tested per NFPA 1911				
6.4.7 Aerial ladders and elevating platforms tested per NFPA 1914				
6.4.8 Apparatus and equipment disinfected per NFPA 1581				
6.5 Tools and Equipment				
6.5.1 Safety and health are primary concerns				
6.5.2 Hearing conservation				
6.5.3 New fire department ground ladders meet NFPA 1931				
6.5.4 New fire hose meets NFPA 1961				
6.5.5 New spray nozzles meet NFPA 1964				
6.5.6 Equipment inspected at least weekly and within 24 hours after any use				
6.5.7 Records maintained for the equipment				
6.5.8 Tested at least annually				
6.5.9 Defective or unserviceable equipment removed from service				
6.5.10 Tools and equipment cleaned per NFPA 1581				
6.5.11 Fire department ground ladders tested per NFPA 1932				
6.5.12 Fire hose inspected and tested per NFPA 1962				
6.5.13 Portable fire extinguishers inspected and tested per NFPA 10				
6.5.14 Powered rescue tools meet NFPA 1936				
Chapter 7 Protective Clothing and Protective Equipment				
7.1 General				
7.1.1 Fire department provides PPE				
7.1.2 Use of PPE				
7.1.3 PPE cleaned every 6 months per NFPA 1581				
7.1.4 Proper cleaning				
7.1.5 Where worn, station work uniforms meet NFPA 1975				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 7 Protective Clothing and Protective Equipment *(continued)*				
7.1.6 Clothing considered thermally unstable not worn				
7.1.7 Laundry service available for contaminated clothing				
7.2 Protective Clothing for Structural Fire Fighting				
7.2.1 Protective clothing meets NFPA 1971				
7.2.2 Minimum 2 in. (50 mm) overlap of all protective clothing layers				
7.2.3 Overlap not required on single-piece protection coveralls				
7.2.4 Gloves have proper interface				
7.2.5 Program in place for selection, care, maintenance, and use of protective clothing				
7.2.6 Require all members to wear appropriate protective ensemble				
7.3 Protective Clothing for Proximity Fire-Fighting Operations				
7.3.1 Proximity fire-fighting protective equipment meeting NFPA 1971 provided and used				
7.3.2 Minimum 2 in. (50 mm) overlap of all protective clothing layers				
7.3.3 Overlap not required on single-piece protection coveralls				
7.3.4 SCBA protected				
7.4 Protective Clothing for Emergency Medical Operations				
7.4.1 Emergency medical protective clothing meeting NFPA 1999 provided and used				
7.4.2 Members use emergency medical gloves				
7.4.3 NIOSH-approved Type C respirators provided for exposure to airborne infectious disease				
7.4.4 Members use emergency medical body and face protection				
7.4.5 Infection control program for EMS protective clothing meets NFPA 1581				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 7 Protective Clothing and Protective Equipment *(continued)*				
7.5 Chemical-Protective Clothing for Hazardous Material Emergency Operations				
7.5.1 Members have and use vapor-protective garments that meet NFPA 1991 when appropriate				
7.5.2 Members have and use liquid splash-protective garments that meet NFPA 1992 when appropriate				
7.5.3 Members have and use appropriate protective ensemble for CBRN terrorism incidents				
7.6 Inspection, Maintenance, and Disposal of Chemical-Protective Clothing				
7.6.1 Inspected and maintained per manufacturer's recommendation				
7.6.2 Dispose of contaminated garments				
7.7 Protective Clothing and Equipment for Wildland Fire Fighting				
7.7.1 SOPs for use of protective clothing				
7.7.2 Protective clothing that meets NFPA 1977 provided and used				
7.7.3 Primary eye protection that meets NFPA 1977 provided and used				
7.7.4 Fire shelter provided and worn properly				
7.8 Protective Ensemble for Technical Rescue Operations				
7.8.1 Technical rescue protective clothing meeting NFPA 1951 provided and used				
7.8.2 Minimum 2 in. (50 mm) overlap of all protective clothing layers				
7.8.3 Respiratory protection certified by NIOSH provided and used				
7.8.4 Primary eye protection that meets NFPA 1951 provided and used				
7.8.5 Protective clothing used and maintained per manufacturer's instructions				
7.9 Respiratory Protection Program				
7.9.1 Respiratory protection program addresses the selection, care, maintenance, and use				
7.9.2 SOPs address respiratory protection				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 7 Protective Clothing and Protective Equipment *(continued)*				
7.9.3 Members qualified at least annually in use				
7.9.4 Reserve SCBA provided and maintained				
7.9.5 Adequate reserve air supply				
7.9.6 Equipment stored ready-for-use and properly protected				
7.9.7 SCBA provided that meets NFPA 1981 and required to be used				
7.9.8 Members understand keeping facepiece in place				
7.10 Breathing Air				
7.10 Breathing air meets NFPA 1989				
7.11 Respiratory Protection Equipment				
7.11.1 SCBA meet appropriate standards				
7.11.2 Supplied-air respirators appropriate for intended application				
7.11.3 Air-purifying respirators NIOSH certified with policy for use				
7.12 Fit Testing				
7.12.1 Quantitative fit test annually				
7.12.2 New members fit tested before permitted in hazardous atmospheres				
7.12.3 Respirators quantitative fit testing in negative pressure mode				
7.12.4 AHJ-required test protocols				
7.12.5 Records of facepiece fitting test				
7.12.6 Protection factor at least 500 for negative-pressure facepieces				
7.13 Using Respiratory Protection				
7.13.1 Facepiece-to-face seal required				
7.13.2 Nothing passes through area of seal				
7.13.3 No beard and facial hair in area of seal				
7.13.4 Spectacles fitted to inside of facepiece				
7.13.5 Spectacle strap or temple bars prohibited				
7.13.6 Contact lenses permitted				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 7 Protective Clothing and Protective Equipment *(continued)*				
7.13.7 Head covering breaking seal prohibited				
7.13.8 SCBA facepiece/head harness worn under protective hood				
7.13.9 SCBA facepiece/head harness worn under hazardous chemical-protective helmet				
7.13.10 Helmet does not interfere with the facepiece-to-face seal				
7.14 SCBA Cylinders				
7.14.1 Inspected annually				
7.14.2 Hydrostatic test cylinders				
7.14.3 In-service SCBA cylinders stored charged				
7.14.4 In-service SCBA cylinders inspected weekly, monthly, and prior to filling				
7.14.5 Personnel protected during SCBA cylinder filling				
7.14.6 Unique situations for rapid filling identified				
7.14.7 Risk assessment process used to identify rapid filling situations				
7.14.8 Rapid refilling of SCBA on person limited				
7.14.9 Emergency situation for air transfer permitted				
7.14.10 Transfilling per manufacturer's instructions				
7.15 Personal Alert Safety Systems (PASS)				
7.15.1 PASS meet NFPA 1982				
7.15.2 New SCBA have integrated PASS				
7.15.3 Members provided with and use PASS device				
7.15.4 Tested at least weekly and prior to use				
7.16 Life Safety Rope and System Components				
7.16.1 Life safety rope and system components meet NFPA 1983				
7.16.2 Life safety rope used for other purposes removed from service				
7.16.3 Reuse of life safety rope only after evaluation				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 7 Protective Clothing and Protective Equipment *(continued)*				
7.16.4 Rope inspection by qualified person				
7.16.5 Records document each life safety rope use				
7.17 Face and Eye Protection				
7.17.1 Eye protection appropriate for hazard provided and used				
7.17.2 SCBA facepiece used as primary face and eye protection				
7.17.3 Primary eye protection used when full facepiece not used				
7.18 Hearing Protection				
7.18.1 Provided and used when apparatus noise in excess of 90 dBA				
7.18.2 Provided and used when tool and equipment noise in excess of 90 dBA				
7.18.3 Hearing conservation program				
7.19 New and Existing Protective Clothing and Protective Equipment				
7.19.1 New PPE meets current standards				
7.19.2 Existing PPE shall have met standards when manufactured				
7.19.3 PPE taken out of service after 15 years				
Chapter 8 Emergency Operations				
8.1 Incident Management				
8.1.1 Prevent accidents and injuries				
8.1.2 Incident management system in writing and meets NFPA 1561				
8.1.3 IMS used at all emergency incidents				
8.1.4 IMS applied to drills, exercises, and training				
8.1.5 Incident commander responsible for safety				
8.1.6 Incident safety officer assigned when needed				
8.1.7 Span of control				
8.1.8 Incident commander's responsibility				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 8 Emergency Operations *(continued)*				
8.2 Communications				
8.2.1 Dispatch and incident communication systems meet NFPA 1561 and NFPA 1221				
8.2.2 SOPs for use of clear text radio messages				
8.2.3 Procedures for emergency traffic				
8.2.4 Incident clock used				
8.3 Risk Management During Emergency Operations				
8.3.1 Risk management integrated in incident command				
8.3.2 Risk management principles used				
8.3.3 IC evaluates risk to members				
8.3.4 Risk management principles routinely employed by supervisors				
8.3.5 Incident safety officer with proper expertise appointed				
8.3.6 Protective equipment appropriate for CBRN exposure				
8.3.7 Consider providing atropine for nerve agents				
8.4 Personnel Accountability During Emergency Operations				
8.4.1 Written SOPs for personnel accountability				
8.4.2 Local conditions and characteristics considered				
8.4.3 Members actively participate				
8.4.4 IC maintains awareness				
8.4.5 TLMC officers supervise assigned companies/crews				
8.4.6 Company officers responsible for members				
8.4.7 Members remain with company				
8.4.8 Member responsible for following personnel accountability system				
8.4.9 Personnel accountability system used at all incidents				
8.4.10 Accountability system effective				
8.4.11 Additional accountability officers				
8.4.12 IC and supervisors responsible for tracking and accountability of assigned companies				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 8 Emergency Operations *(continued)*				
8.5 Members Operating at Emergency Incidents				
8.5.1 Adequate number of personnel provided to safely conduct emergency operations				
8.5.2 No evolutions outside of established safety criteria				
8.5.3 Inexperienced members directly supervised				
8.5.4 Members operate in teams of two or more				
8.5.5 Crew members in communication with each other				
8.5.6 Crew members operate in proximity to each other				
8.5.7 Two in, two out in initial stages				
8.5.8 Standby members maintain awareness				
8.5.9 Standby members remain in communication				
8.5.10 Initial stage understood				
8.5.11 Standby member permitted to perform other duties outside of the hazard area				
8.5.12 Standby member restricted activities				
8.5.13 Standby members have full PPE and SCBA				
8.5.14 Standby members don full PPE and SCBA before entering hazardous area				
8.5.15 Standby member limitations				
8.5.16 Rapid intervention crew deployed when incident no longer in initial stage				
8.5.17 In imminent life-threatening situation, action to prevent loss of life permitted with less than four personnel				
8.5.18 At aircraft rescue and fire fighting, IDLH area within 75 ft (23 m) of aircraft				
8.5.19 Highest available level of EMS available for special operations				
8.5.20 EMS personnel at hazmat operations meet NFPA 473				
8.5.21 IC requests EMS to be available				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 8 Emergency Operations *(continued)*				
8.5.22 Members secured to aerial device				
8.5.23 PPE and SCBA used by fire investigators and others in IDLH atmosphere				
8.5.24 Water rescue members wear personal flotation devices				
8.6 Control Zones				
8.6.1 Control zones are established				
8.6.2 Members operating in hot zone wear PPE and have assignment				
8.7 Traffic Incidents				
8.7.1 Appropriate measures taken to protect members				
8.7.2 SOPs for operations involving traffic incidents				
8.7.3 Apparatus and warning devices used to protect members				
8.7.4 Apparatus positioned to protect members				
8.7.5 Warning devices used for oncoming traffic				
8.7.6 Warning device placement sensitive to conditions				
8.7.7 First unit addresses traffic issues				
8.7.8 Members and victims in secure area				
8.7.9 Unneeded vehicles parked off roadway				
8.7.10 Members wear garments with visible materials				
8.7.11 Members trained in traffic control				
8.8 Rapid Intervention for Rescue of Members				
8.8.1 Personnel provided for rescue of members				
8.8.2 Rapid intervention crew equipped and available				
8.8.3 Composure and structure of RIC flexible				
8.8.4 IC provides RICs appropriate for incident size				
8.8.5 RIC status in early stages				
8.8.6 RIC status at expanded incident				
8.8.7 RICs for special operations				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 8 Emergency Operations *(continued)*				
8.9 Rehabilitation During Emergency Operations				
8.9.1 SOP for rehabilitation of members				
8.9.2 IC initiates rehabilitation per SOPs and NFPA 1561				
8.9.3 On-scene rehabilitation to include complete support				
8.9.4 Each member responsible to communicate rehabilitation needs				
8.9.5 Each wildland fire fighter provided with 2 qt (2 L) of water				
8.10 Violence, Civil Unrest, or Terrorism				
8.10.1 Fire department not involved in activity without law enforcement present				
8.10.2 Fire department personnel not involved in crowd control				
8.10.3 SOPs for member safety at civil disturbance				
8.10.4 Interagency agreement for protection of members				
8.10.5 Communication to indicate life-and-death situations				
8.10.6 Fire department to coordinate with law enforcement				
8.10.7 Fire department IC identifies and reacts to violent situations				
8.10.8 Fire department IC communicates with law enforcement IC				
8.10.9 Stage resources in a safe area until scene secure				
8.10.10 Secure law enforcement or withdraw when violence occurs				
8.10.11 Body armor used only by members trained and qualified				
8.10.12 Members supporting SWAT operations trained and operating under SOPs				
8.11 Post-Incident Analysis				
8.11.1 SOPs for standardized post-incident critique				
8.11.2 Incident safety officer involved in critique				
8.11.3 Review of conditions and actions on the safety and health of members				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 8 Emergency Operations *(continued)*				
8.11.4 Identify needed action to improve welfare of members				
8.11.5 Analysis includes standard action plan				
Chapter 9 Facility Safety				
9.1 Safety Standards				
9.1.1 Comply with codes				
9.1.2 Facilities for disinfecting, cleaning, and storage per NFPA 1581				
9.1.3 All facilities have smoke detectors				
9.1.4 All facilities have carbon monoxide detectors				
9.1.5 All facilities comply with NFPA *101*				
9.1.6 Methods to prevent exhaust exposure				
9.1.7 Contaminated PPE not in living and sleeping areas				
9.1.8 Smoke-free facilities				
9.1.9 Pole holes secured				
9.2 Inspections				
9.2.1 Annual code inspection				
9.2.2 Inspections documented				
9.2.3 Monthly safety and health inspection				
9.3 Maintenance and Repairs				
9.3 System to maintain facilities and correct safety or health hazards				
Chapter 10 Medical and Physical Requirements				
10.1 Medical Requirements				
10.1.1 Medical qualified before becoming a member				
10.1.2 Medical evaluation considers risks and functions associated with duties				
10.1.3 Candidates and members meet NFPA 1582				
10.1.4 Aircraft pilots comply with FAA regulations				
10.1.5 Members under influence of drugs or alcohol excluded from participation				

FIGURE B.2 ***Continued***

NFPA 1500
FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 10 Medical and Physical Requirements *(continued)*				
10.2 Physical Performance Requirements				
10.2.1 Fire department develops requirements				
10.2.2 Candidates qualified prior to training				
10.2.3 Members annually qualified				
10.2.4 Members not qualified not involved in emergency operations				
10.2.5 Physical performance rehabilitation program available				
10.3 Health and Fitness				
10.3.1 Health and fitness program meets NFPA 1583				
10.3.2 Fitness levels determined by individual's assigned functions				
10.3.3 Health and fitness coordinator administers the program				
10.3.4 Health and fitness coordinator acts as liaison				
10.4 Confidential Health Data Base				
10.4.1 Individual health file for each member				
10.4.2 Health file complete				
10.4.3 Composite data base for analysis				
10.4.4 Autopsy results in health data base				
10.5 Infection Control				
10.5.1 Fire department limits or prevents member's exposure				
10.5.2 Infection control program meets NFPA 1581				
10.6 Fire Department Physician				
10.6.1 Fire department physician officially designated				
10.6.2 Provides medical guidance in management of safety and health program				
10.6.3 Physician licensed				
10.6.4 Available on urgent basis				
10.6.5 Health and safety officer and health fitness coordinator liaison with physician				

FIGURE B.2 ***Continued***

NFPA 1500

FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAM WORKSHEET *(continued)*

Reference in Standard	Percent in Compliance	Estimated Cost to Comply	Expected Compliance Date	Remarks
Chapter 11 Member Assistance and Wellness Programs				
11.1 Member Assistance Program				
11.1.1 Provide member assistance program				
11.1.2 Program refers members to appropriate health care services				
11.1.3 Written policy on alcoholism and substance abuse				
11.1.4 Written rules for records				
11.1.5 Member assistance records not part of member's personnel file				
11.2 Wellness Program				
11.2.1 Wellness program established				
11.2.2 Program on health effects with tobacco products				
Chapter 12 Critical Incident Stress Program				
12.1 General				
12.1.1 Physician to provide guidance				
12.1.2 Written policy that establishes program to relieve stress				
12.1.3 Criteria for implementation				
12.1.4 Program available to members for situations affecting members' psychological and physical well-being				

FIGURE B.2 ***Continued***

B.3

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 column, the user can record the percentage of compliance with a specific requirement, whether just getting started, about 50 percent complete, or in full compliance. The remarks can indicate factors that are affecting achieving compliance, whether they are financial, administrative, or in need of legislative action. Where compliance will cost money, the third column can be used to record an estimate of the cost to comply. Again the remarks can indicate whether this is an operating budget or a capital planning budget–type expense. The fourth column allows for indicating an expected or anticipated compliance date. Any additional remarks or changes should be included in the last column for explanatory purposes. This is not a "one size fits all" worksheet and should be modified or expanded 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 placards as specified in NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*. 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.1.6.

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. Determining the frequency and severity of occurrence of risks will serve as a method for establishing priorities. 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. 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, *Recommended Practice in Emergency Service Organization Risk Management*.

[ANYTOWN] FIRE DEPARTMENT
RISK MANAGEMENT PLAN

Purpose

The *[Anytown]* Fire Department has developed and implemented a risk management plan. The goals and objectives of the plan are as follows:

(1) To limit the exposure of the fire department to situations and occurrences that could have harmful or undesirable consequences on the department or its members

(2) To provide the safest possible work environment for the members of the fire department, while recognizing the risks inherent to the fire department's mission

Scope

The risk management plan is intended to comply with the requirements of NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*.

Methodology

The risk management plan uses a variety of strategies and approaches to address different objectives. The specific objectives are identified from the following sources of information:

(1) Records and reports on the frequency and severity of accidents and injuries in the *[Anytown]* Fire Department

(2) Reports received from the *[Anytown]* Fire Department's insurance carriers

(3) Specific occurrences that identify the need for risk management

(4) National trends and reports that are applicable to *[Anytown]*

(5) Knowledge of the inherent risks that are encountered by fire departments and specific situations that are identified in *[Anytown]*

(6) Any additional areas identified by fire department staff and personnel

Responsibilities

The fire chief has responsibility for the implementation and operation of the department's risk management plan. The department's health and safety officer has the responsibility to develop, manage, and annually revise the risk management plan. The health and safety officer also has the responsibility to modify the risk management plan when warranted by changing exposures, occurrences, and activities.

All members of the *[Anytown]* Fire Department have responsibility for ensuring their own health and safety based upon the requirements of the risk management plan and the department's safety and health program.

Plan Organization

The risk management plan includes the following:

(1) Identification of the risks members of the fire department could actually or potentially encounter, both emergency and non-emergency

  (a) Emergency risks include those presented at emergency incidents, both fire and non-fire (e.g., hazardous materials), Emergency Medical Services incidents, and emergency response.

  (b) Non-emergency risks include those encountered while performing functions such as training, physical fitness, non-emergency vehicle operation, and station activities (e.g., vehicle maintenance, station maintenance, daily office functions).

(2) Evaluation of the identified risks based upon the frequency and severity factors

(3) Development and implementation of an action plan for controlling each of the risks, in order of priority

(4) Provisions for monitoring the effectiveness of the controls implemented

(5) A periodic review of the plan with modifications made as needed

The plan requires a monitoring process which may be done by the health and safety committee or the health and safety officers.

Risk Management Plan Monitoring

(1) The *[Anytown]* Fire Department's risk management program will be monitored annually, in January, by the health and safety officer.

(2) Recommendations and revisions will be made based on the following criteria:

  (a) Annual accident and injury data for the preceding year

  (b) Significant incidents that have occurred during the past year

  (c) Information and suggestions from department staff and personnel

(3) Every 3 years, the risk management program will be evaluated by an independent source. Recommendations will be sent to the fire chief, the health and safety officer, and the occupational safety and health committee.

FIGURE D.2 Sample Risk Management Plan.

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 General.

In addition to the obvious difference of size, wildland fires require more personnel and more resources spread out over a larger area. Because of these factors, wildland fires present three areas of safety concerns: the fire fighter, the area immediately surrounding the fire fighter, and the overall environment of the fire itself.

Wildland fires require long hours of arduous work in the worst of conditions.

Training personnel who respond to wildland fires should include the following as part of the training curriculum, as some wildland fire fighter fatalities have been attributed to the failure to follow the 10 Standard Fire Orders, or the failure to recognize one or more of the 18 Watch Out Situations.

For the fire fighter, tools and personal protective equipment (PPE) are an essential part of the safety component. Some of the major differences in tools and PPE used by wildland fire fighters are the following:

(1) Flame-resistant trousers and shirts do not absorb moisture, allow air to pass through, and allow free movement.

(2) Hardhat is lightweight, impact-resistant, and well ventilated to protect against heat stress.

(3) Ventilated safety goggles with impact-resistant lenses minimize fogging.

(4) Cotton bandana is used for respiratory protection.

(5) Leather gloves are treated for thermal and flame resistance and designed with minimal seams to prevent blisters when using tools.

(6) High-top, leather work boots worn with wool socks are lightweight enough to prevent fatigue over long periods of time.

(7) Field packs distribute weight along the hips and can be removed easily in emergencies.

(8) Wool jacket has natural fire-resistant properties and good air flow.

(9) Fire shelter is the last-chance lifesaver and used only when every possible means of escape is exhausted.

The protective equipment used for wildland fire fighting does have limitations. Clothing does not provide thermal or steam protection. Self-contained breathing apparatus (SCBA) are not used in the wildland environment, leaving fire fighters vulnerable to smoke inhalation and

carbon monoxide poisoning. Prolonged burning aggravates thermal inversions, trapping smoke and gases close to the ground and increasing the risk of exposure.

E.2 Standard Fire Orders.

The 10 Standard Fire Orders were developed in 1957 by a task force studying ways to prevent fire fighter injuries and fatalities. If fire fighters follow the 10 Standard Fire Orders and are alerted to the 18 Watch Out Situations, much of the risk of fire fighting can be reduced.

The National Wildfire Coordinating Group (NWCG) parent group approved the revision of the 10 Standard Fire Orders in accordance with their original arrangement. The original arrangement of the Orders is logically organized to be implemented systematically and applied to all fire situations, as follows:

10 STANDARD FIRE ORDERS

Fire Behavior

(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.
Fireline Safety

(4) Identify escape routes and make them known.

(5) Post lookouts when there is possible danger.

(6) Be alert. Keep calm. Think clearly. Act decisively.
Organizational Control

(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.
If 1 through 9 are considered, then

(10) Fight fire aggressively, having provided for safety first.

The 10 Standard Fire Orders are firm. We don't break them; we don't bend them. All fire fighters have a right to a safe assignment.

E.3 Lookouts, Communications, Escape Routes, and Safety Zones (LCES).

In the wildland fire environment, four basic safety hazards confront the fire fighter: lightning, fire-weakened timber, rolling rocks, and entrapment by running fires. Each fire fighter must know the interconnection of Lookouts, Communications, Escape Routes, and Safety Zones (LCES). LCES should be established before fighting the fire: select lookouts, set up communications, choose escape routes, and select safety zones.

LCES functions sequentially; it is 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 basic guidelines:

(1) Before safety is threatened, each fire fighter must know how the LCES system will be used.

(2) LCES must be re-evaluated continuously 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 years of active fireline suppression duties. LCES simply focuses on the essential elements of the Standard Fire Orders. Its use should be automatic in fireline operations, and all fire fighters should know the LCES interconnection.

E.4 Watch Out Situations.

Shortly after the Standard Fire 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 Fire Orders, and describe situations that expand the 10 points of the Fire Orders, as follows:

18 WATCH OUT SITUATIONS

(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 between crew members and supervisors

(8) Constructing line without safe anchor point

(9) Building line 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 gets hotter and drier

(15) Wind increases and/or changes direction

(16) Getting frequent spot fires across line

(17) Terrain or fuels make escape to safety zones difficult

(18) Feel like taking a nap near fireline

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, as explained in F.1.1 through F.1.3.

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 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. NFPA has classified chemical-protective suits by their performance in the following two standards:

(1) Vapor-protective suits (NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies*) (Level A)

(2) Liquid splash-protective suits (NFPA 1992, *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies*) (Level B with SCBA)

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.2.1 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, which should be done per the manufacturer's recommendation. 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.2.2 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.2.3 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.2.4 The manufacturer's 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 manufacturer's instructions should be thorough enough to allow trained fire department members to wear and use the suit without a large number of questions.

F.2.5 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.

FACILITY SAFETY CHECKLIST

Facility: _____ **Date:** _____

I. GENERAL

____ The required OSHA 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: _____

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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 OSHA standards.

____ First aid supplies shall be available and clearly identified as to location.

____ Shower curtains shall provide adequate protection to prevent floors from becoming excessively wet and slippery.

____ Cooking appliances, including gas and charcoal grills, and eating utensils shall be kept clean and in good working order.

Comments: _____

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III. EXITS

____ All exits shall be visible and unobstructed.

____ All exits shall be marked with a readily visible sign that is illuminated if required by building code.

____ Doors that 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 shall be wide enough for easy access.

Comments: _____

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IV. WALKING AND WORKING SURFACES

____ Floors shall be kept as 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: _____

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FIGURE G.1 Sample Facilities Safety Checklist.

FACILITY SAFETY CHECKLIST *(continued)*

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 as clean and dry as possible.

____ Work rests on grinders shall be adjusted to within ⅛ in. to the grinding wheel.

____ Grinders and grinding wheels shall be adequately guarded. The safety guard shall cover the spindle end, the 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: _____

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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 shall 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 at least weekly.

Comments: _____

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VII. BUILDING EXTERIOR AND GROUNDS

____ The exterior of the building shall be in good condition. There shall be no missing finishes or temporary repairs. Roof shingles shall not be missing, and all windows shall function.

____ There shall be no accumulation of debris or trash next to the building or on the station grounds.

____ All walkway 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:

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FIGURE G.1 ***Continued***

FACILITY SAFETY CHECKLIST *(continued)*

VIII. DECONTAMINATION ROOMS

____ The decontamination room shall be clean and orderly and free of storage not related to decontamination.

____ The decontamination room shall have instructions clearly posted as to how to proceed through decontamination.

____ There shall be an inventory on hand in the decontamination room, and the inventory shall be complete with the supplies on hand.

____ The decontamination 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.

____ If the station is equipped with a fire alarm system, the system shall be maintained and tested by a qualified person to the requirements of NFPA 72.

____ If the station is equipped with a sprinkler system, the system shall be maintained and tested by a qualified person to the requirements of NFPA 25.

____ The minimum clearance of 18 in. shall be maintained below the sprinkler heads.

____ Smoke detectors shall be inspected and tested quarterly.

____ Carbon monoxide detectors shall be inspected and 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 gallons must be stored in an approved storage locker. The containers must be made of metal, or the containers must be stored in a storage cabinet approved for flammable materials.

____ 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 that might 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 shall be properly covered.

Comments: _____

FIGURE G.1 ***Continued***

FACILITY SAFETY CHECKLIST *(continued)*

XII. OTHER

____ Check all physical fitness equipment for safety issues. Inspect all cables, pulleys, seats, hinges, handles, grips, and connectors.

____ Check the physical fitness equipment inventory to be sure all equipment is available for use.

____ Check for the appropriate amount of space within the physical fitness area to safely utilize the equipment.

____ Portable heaters used in stations shall be placed out of travel routes, placed away from combustibles, and if turned over, shall turn themselves off.

____ Monthly station generator check-off completed.

____ Stations housing an on-site SCBA air compressor shall have in place and utilize a log book that meets 29 CFR 1910.134, which include the log-in of the following information: date bottle was filled, hydrostatic test date, identification number, and the person filling the bottle.

____ Compressor and cascade records shall be clear and up to date. Air quality checks shall be posted in compressor room.

____ Fill station containment device shall be in good working order.

____ Any situation that warrants a concern shall be brought to the attention of the department's safety officer.

____ Inspection by certified agency conducted for compressors rated at 60 gal and above.

____ Inspection by certified agency conducted for hot water heaters with 120 gal and above.

____ Have problems been documented?

____ Any other concerns?

Comments: _____

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_____

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FIGURE G.1 ***Continued***

Annex H Informational References

H.1 Referenced Publications.

The documents or portions thereof listed in this annex are referenced within the informational sections of this standard and are not part of the requirements of this document unless also listed in Chapter 2 for other reasons.

H.1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1, *Uniform Fire Code*™, 2006 edition.

NFPA 70, *National Electrical Code*®, 2005 edition.

NFPA *101*®, *Life Safety Code*®, 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*, 2007 edition.

NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling Units*, 2005 edition.

NFPA 901, *Standard Classifications for Incident Reporting and Fire Protection Data*, 2006 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*, 2006 edition.

NFPA 1404, *Standard for Fire Service Respiratory Protection Training*, 2006 edition.

NFPA 1405, *Guide for Land-Based Fire Fighters Who Respond to Marine Vessel Fires*, 2006 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*, 2007 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 1851, *Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles*, 2001 edition.

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

NFPA 1912, *Standard for Fire Apparatus Refurbishing*, 2006 edition.

NFPA 1971, *Standard on Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting*, 2007 edition.

NFPA 1975, *Standard on Station/Work Uniforms for Fire and Emergency Services*, 2004 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 Fire and Emergency Services*, 2002 edition.

NFPA 1991, *Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies*, 2005 edition.

NFPA 1992, *Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies*, 2005 edition.

NFPA 1994, *Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents*, 2007 edition.

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

NFPA 5000®, *Building Construction and Safety Code®*, 2006 edition.

NFPA *Fire Protection Handbook*, 19th edition, 2003.

H.1.2 Other Publications.

H.1.2.1 ANSI Publications. American National Standards Institute, Inc., 25 West 43rd Street, 4th Floor, New York, NY 10036.

ANSI Z88.2, *Standard for Respiratory Protection*, 1992.

H.1.2.2 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, 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 Federal Emergency Management Agency, United States Fire Administration Publications. U.S. Fire Administration, 16825 S. Seaton Avenue, Emmitsburg, MD 21727. Also at http://www.usfa.fema.gov/

FA-100, *Stress Management Model Program for Maintaining Firefighter Well-Being*, 1990.

FA-118, *Fire and Emergency Service Hearing Conservation Program Manual*, 1991.

FA-220, *Firefighter Fatality Retrospective Study*, 2002.

FA-248, *Safe Operation of Fire Tankers*, 2003.

FA-272, *Emergency Vehicle Safety Initiative*, 2004.

H.1.2.4 IAFF/IAFC Publications. (IAFF) 1750 New York Avenue, NW, Washington, DC 20006; (IAFC) 4025 Fair Ridge Drive, Fairfax, VA 22033-2868.

The IAFF/IAFC Fire Service Joint Labor Management Candidate Physical Ability Test (CPAT) Manual.

H.1.2.5 IAPMO Publications. International Association of Plumbing and Mechanical Officials, 5001 E. Philadelphia Street, Ontario, CA 91761.

Uniform Mechanical Code, 2003.

Uniform Plumbing Code, 2003.

H.1.2.6 ICMA Publications. International City/County Management Association, 777 North Capitol Street N.E., Suite 500, Washington, DC 20002.

Managing Fire and Rescue Services, 2002.

H.1.2.7 NFSIMSC Publications. Fire Protection Publications, Oklahoma State University, Stillwater, OK 74078.

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H.1.2.8 USDA Forest Service Publications. Missoula Technology and Development

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